

Building an
**Academic
Health Center**
for the 21ST
Century

A Strategic Plan for Rutgers Biomedical and Health Sciences

NOVEMBER 2014

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To RBHS Faculty, Staff, and Students:



I am excited and honored to present the Rutgers Biomedical and Health Sciences (RBHS) strategic plan. I believe this plan, which will guide us for the next five years, is appropriately bold and ambitious and that we are in an excellent position to achieve our goals.

In the plan, we have selected clinical, research, educational, and service initiatives that will take advantage of the changing health care environment, our strengths, and opportunities for growth. These initiatives are also linked to the integrating themes and strategic priorities identified in the Rutgers strategic plan. They are designed to cut across RBHS schools and programs so that RBHS becomes much stronger and more capable and productive than merely the sum of its parts. This also will enable RBHS to integrate with our three geographic universities, Rutgers University–New Brunswick, Rutgers University–Newark, and Rutgers University–Camden, and best serve the needs of our community and state.

Our plan represents the collective efforts of more than 5,000 RBHS faculty, staff, and students, with input provided by additional faculty and staff universitywide. Twenty-four faculty, staff, and students served as members of the RBHS Strategic Planning Steering Committee and more than 500 faculty members participated as members of 32 working groups.

The steering committee and working groups were particularly instrumental in the development of our plan, as the working groups prepared proposals that were reviewed by the steering committee, which, in turn, recommended the strongest and most promising for selection as initiatives to be the focus of the strategic plan. Ultimately, four signature programs, one emerging signature program, four complementary programs, seven educational initiatives, and multiple “enabling structures,” designed to provide infrastructure support for the programs and initiatives, were recommended to me, which I was delighted to accept. Separately, a series of clinical initiatives were selected to enhance clinical services and the quality of patient care.

The RBHS strategic plan initiatives will fold into the Rutgers strategic plan and work synergistically with the Rutgers University–New Brunswick, Rutgers University–Newark, and Rutgers University–Camden plans, as appropriate. Together, the three geographically-based universities and RBHS will work with President Barchi to enhance Rutgers’ capacity to become one of the finest research universities in the country.

I invite you to review and embrace our strategic plan, and I look forward to working with you in the years ahead as we strive to make RBHS what we want it to be.

Sincerely,

A handwritten signature in blue ink, reading "Brian L. Strom".

Brian L. Strom, MD, MPH
Chancellor
Rutgers Biomedical and Health Sciences

November 1, 2014



EXECUTIVE SUMMARY

Overview

Rutgers Biomedical and Health Sciences (RBHS) serves as the umbrella organization for eight schools, four centers and institutes, and a behavioral health network. RBHS was created in July 2013, in accordance with the 2012 New Jersey Medical and Health Sciences Education Restructuring Act. The creation of RBHS within Rutgers, The State University of New Jersey, established Rutgers as one of the largest academic institutions in the United States providing health care education, research, and clinical service and care.

As an academic health center, RBHS recognizes the changing health care environment and is positioning itself accordingly. With the enactment of the Patient Protection and Affordable Care Act, accountability for patient care is shifting to providers, health care will be more value-driven, and health care teams must embrace interprofessional collaboration and innovation. The focus of health care will be population-based, rather than individual-based, and the provision of health care will move from large regional centers toward community centers. Further, rapid changes in technology will provide new opportunities for patient care and research.

RBHS is poised to take advantage of, and excel in, this new environment, with its schools of allied health professions, biomedical sciences, dental medicine, medicine, nursing, public health, and pharmacy; its centers and institutes focusing on cancer, advanced biotechnology and medicine, environmental and occupational health, and health care, health care policy, and aging research; and its behavioral health care unit.

Preparing for the challenges of a changing health care environment and addressing the charge to develop a strategic plan, the RBHS community embarked on a comprehensive and inclusive discovery and planning process beginning in December 2013. The vision for the resulting five-year RBHS strategic plan is to

strengthen programs across all RBHS schools and units, foster integration and collaboration across RBHS and between RBHS and the university's non-RBHS programs, build academic strength in health throughout Rutgers, and serve the state by improving health and access to health care.

The plan was developed with input from more than 5,000 faculty, staff, and students who responded to surveys; the 24 members of the RBHS Strategic Planning Steering Committee, representing all RBHS constituencies, other Rutgers faculty, and the New Brunswick and Newark communities; more than 500 faculty who served as members of working groups; New Brunswick, Newark, and Camden community focus groups, which included 40 community representatives; and the RBHS leadership, including the chancellor and school deans and unit directors.

In developing the strategic plan, consideration was given to the changing health care environment, as well as the overarching Rutgers strategic plan and its integrating themes, strategic priorities, and foundational elements. Rutgers aspires *to be broadly recognized as among the nation's leading public universities: preeminent in research, excellent in teaching, and committed to community*. Relevant integrating themes of the universitywide strategic plan that are particularly applicable for RBHS include: cultures, diversity, and inequality—local and global; improving the health and wellness of individuals and populations; and creating a sustainable world through innovation, engineering, and technology.

Signature Programs

Signature programs for the RBHS strategic plan have been chosen from current programs of strength. The objective is to build these signature programs across all RBHS units and for the programs to become among the best in the nation over the next five years through strategic investment.

The **Cancer** program will take advantage of the overarching structure of the Rutgers Cancer Institute of New Jersey. The program will enhance team science through a series of targeted initiatives:

- changing the culture, eliminating silos;
- developing funding mechanisms to enhance collaboration and prime multi-investigator projects and funding vehicles;
- identifying and recruiting key faculty who will both increase its breadth and depth and provide guidance for pursuing vitally important team science grants such as National Institutes of Health-funded program project grants and specialized programs of research excellence;
- expanding its programs to Newark and statewide; and
- building and supporting key infrastructure, including shared resources and staffing, to ensure success of the plan.

Incremental investment will be needed to: provide pilot funding to generate preliminary data, provide protected time for enhanced research productivity, recruit new faculty, and support critical infrastructure development and use.

The **Environmental and Occupational Health** program will take advantage of the considerable strength in the existing Environmental and Occupational Health Sciences Institute (EOHSI). EOHSI's faculty members have built research programs utilizing an interdisciplinary model that integrates environmental and occupational health with policy, planning, engineering, and other disciplines across the university. An important initial step is to hire a visionary director for EOHSI.

Major efforts in the upcoming five years also will include recruiting junior faculty in some or all of the following key areas of existing strength, who are needed to fill gaps and replace senior faculty: exposure science, environmental epidemiology, environmental toxicology, epigenetics, environmental engineering, and risk analysis. Recruitment and investment also are needed in two emerging areas within environmental health: individual susceptibility to environmental disease and nanomaterial impact on environmental health. Further, a universitywide committee will be established to coordinate and facilitate productive interdisciplinary programs in environmental health. Membership should include central Rutgers administration, RBHS representation, and talented senior faculty. The committee will have a broad mandate, including brainstorming, hiring, and joint fundraising for interdisciplinary research.

RBHS Aspiration and Identity Statement

Aspiration

RBHS aspires to be recognized as one of the best academic health centers in the United States, known for its education, research, clinical care, and commitment to improving access to health care and reducing health care disparities. This will be achieved through dedication to elevated standards of excellence and innovation, interprofessional collaboration and integration, and deep engagement with the community.

Identity

RBHS leads Rutgers' efforts to be a state, national, and international leader in the biomedical and health sciences and their related professions. The approach incorporates insights from laboratory sciences and the clinical, behavioral, public health, and social sciences, as well as from non-health care disciplines, including business, economics, engineering, law, the arts, and the humanities. RBHS will advance population-based, value-driven health care by building on its recognized clinical and research excellence, engaging with local and global communities, taking advantage of and strengthening its uniquely diverse workforce, and realizing interprofessional synergies among its schools and institutes. Further, RBHS will strengthen its many professional ties with state and federal governments and foster new public-private partnerships with industries critical and vital to New Jersey's economy.



Infection and Inflammation will take advantage of the considerable strength in the newly established Institute for Infectious and Inflammatory Disease (I³D). This program has particular strengths in host-microbe interactions, immunopathology, and global health. Specific initiatives include:

- recruitment of junior and mid-level faculty with expertise in the targeted areas of host-microbe interactions, immunopathology, and global health and recruitment of mid-level or senior faculty to lead research programs in these areas;
- encouraging and rewarding collaboration by moving faculty with common interests to common locations in Newark and New Brunswick/Piscataway, holding yearly retreats, working closely with the Office of Technology Commercialization to generate intellectual property portfolios, establishing partnerships with pharmaceutical and biotechnology companies, and initiating a pilot grant program to enable the development of multi-investigator grant proposals;
- developing state-of-the-art resources, including new core facilities for metabolomics, bioinformatics, and clinical research/trials units;
- upgrading/maintaining equipment in existing core facilities;
- upgrading animal facilities; and
- raising funds from private donors in New Jersey and nationally.

The **Neuroscience** program will be based in the new Brain Health Institute. The institute's goal is to develop neuroscience at Rutgers to become a nationally preeminent and highly translational research enterprise. New tools are transforming neuroscience and these afford an unprecedented opportunity to create new treatments for central nervous system disorders. Initial focus will be on four areas and associated disorders: neurodevelopmental (autism spectrum disorder and schizophrenia), neurodegeneration and injury (multiple sclerosis, Parkinson's and Alzheimer's diseases, spinal cord and traumatic brain injury), cognitive and sensory neuroscience, and motivational neuroscience (addiction, obesity). The program will have three major goals:

- to create research programs focused on the biological underpinnings of healthy central nervous system function, as well as dysfunctions associated with the above disorders;
- to develop new treatments for these disorders using neuroscience tools; and
- to establish a rich neuroscience resource in New Jersey that educates the public, clinicians, faculty, and students, as well as state, national, and international health officials.

Ultimately the program will seek to identify the biological bases of nervous system function and dysfunction, and apply new neuroscience techniques to develop powerful, effective strategies for prevention and treatment of brain and spinal disorders.



Community Health and Health Systems has been selected as an emerging signature program. The program’s goal is to promote evidence-based population health improvement by engaging diverse communities and advancing delivery system innovation.

Although Rutgers is well positioned to advance its role and standing in the fields of community health and health systems improvement, with a substantial number of faculty having interests in relevant areas, it does not currently have the depth of funded faculty to develop a program likely to compete with the top programs nationally within the next five years. However, work in this area will address a vital RBHS goal of providing community health care and is of great consequence to the state. This will be accomplished by developing and sustaining capacity to generate high-impact, rigorous research; attracting significant extramural support; effectively translating research to policy and practice; and, ultimately, making major contributions to improving population health, eliminating health disparities, and promoting health equity. Initial activities will focus on building capacity within Rutgers.

Complementary Programs

Complementary programs will be developed RBHS-wide to focus on areas that, while relatively strong, are not currently of sufficient strength to have the potential to be among the

best in the nation within the next five years, but are essential for the growth and development of RBHS, for the success of RBHS signature programs, and to Rutgers’ mission. In two of the complementary programs (Clinical Research and Public Health), RBHS will take the lead. In the other two (Informatics and Drug Discovery and Development), RBHS will participate in programs being led by the university’s central administration.

The **Clinical Research** complementary program will undertake two important initiatives in support of the RBHS signature programs, the emerging signature program, and other research programs.

The first is the development of the infrastructure needed to support a National Institutes of Health (NIH) application for a Clinical and Translational Science Award (CTSA). The CTSA, when funded, would provide expanded core resources in key areas, including biostatistics, bioinformatics, data management, clinical trials and epidemiology, research nursing, and pharmacy and pharmacology.

The second initiative is a collaboration with Rutgers University Cell and DNA Repository (RUCDR) Infinite Biologics. The collaboration will enable RUCDR to support RBHS researchers focusing on the genetic causes of common, complex human diseases and enable genomic discoveries that will lead to diagnoses, treatments, and cures for these diseases. Through this collaboration with RUCDR, resources will be available to assist investigators and provide access to high-quality biomaterials, technical consultation, and logistical support.

RBHS will play a major role in a complementary program and university-led initiative in **Drug Discovery and Development**. A Rutgers-wide Drug Design Center will be formed to enhance collaborative design and discovery of lead compounds to advance medicine and the understanding of disease. Six objectives have been identified for the RBHS complementary program component:

- formally designating drug discovery and development core competencies in platform technologies;
- promoting joint recruitment of world-class faculty across academic units;
- enabling multi-principal investigator collaborative grant opportunities and establishing training and educational initiatives

that align with core competencies in platform technologies and translational research in signature programs;

- providing essential service capabilities where collaborative teams are not available;
- instituting an interdisciplinary seminar series and working groups focused on drug discovery and development; and
- maximizing the value of collaborative innovation by creating new tools and lead compounds relevant to drug discovery and development through collaborative research.

It is critical for Rutgers to develop and implement a bold, strategic vision for an advanced cyberinfrastructure (ACI) ecosystem that addresses **Informatics** needs universitywide. The RBHS plans for a complementary program in informatics will be aligned accordingly. Plans include: participating in the Rutgers-wide Office for Research Cyberinfrastructure, deploying a balanced ACI at Rutgers, recruiting faculty with systems and computational expertise, recruiting faculty with biomedical informatics expertise, and establishing multidisciplinary research and educational structures.

The RBHS complementary program in **Public Health, including global health**, will address key priorities for Rutgers, New Jersey, and our partners around the world. An important initiative will be recruiting a dean for the School of Public Health who also will lead this complementary program.

The program will provide methodological expertise through a Biostatistics and Epidemiology Consultation Center to be created. Additional initiatives include recruitment of junior and senior methodologists, organization of conferences to attract stakeholders in each of the signature program areas, and creation of pilot grant programs to support research in each of the signature areas. Goals include the development of multi-investigator grant proposals in each of the signature areas and a faculty mentorship program to support rising junior faculty in each of the signature program areas. Global health activities, overseen by the RBHS chancellor, will include the recruitment of a Henry Rutgers Term Chair for Global Health, pilot funds to support the development of global health research programs, development of a global health master's degree program, recruitment of faculty with interests in global health, and creation of a web-based global health resource center, providing information for faculty and students with these interests.

Educational Initiatives

Seven educational initiatives have been selected because of the potential for each to improve and/or enrich educational and training programs across RBHS.

A **Novel Approaches to Teaching** initiative within RBHS will create learning environments that promote quality and patient safety and advance educational excellence. Six objectives are envisioned: expanding the usage of existing simulation facilities by extending access to all learners on the same campuses where appropriate; developing an administrative structure to oversee the utilization, planning, designing, and maintenance of current and future simulation resources; adopting a single, unified learning management platform; mapping, developing, and sharing RBHS foundational curricular resources; enhancing and expanding the utilization of distance learning for undergraduate, graduate, and continuing education; and determining the feasibility of shortening the training path for all RBHS students. This initiative will be led by the RBHS vice chancellor for interprofessional programs, with guidance provided by an RBHS Novel Approaches to Teaching Steering Committee.

An **Interprofessional Education** (IPE) program at RBHS will train health professions students to work as members of highly competent interprofessional collaborative teams during their



We are pursuing the reorganization and integration of several programs in order to create academic strength and greater efficiency within RBHS and across Rutgers.

professional careers. Four objectives are planned: creating an RBHS-wide administrative infrastructure to oversee and support the development of IPE initiatives at RBHS; facilitating the development of a wide range of IPE learning opportunities for RBHS students; augmenting the physical infrastructure available to RBHS students for IPE experiences; and enhancing the national reputation of RBHS as a leader in interprofessional education. An Interprofessional Faculty Advisory Council will advise the RBHS vice chancellor for interprofessional programs, who will lead this program.

RBHS will work under the direction of other Rutgers entities to support three additional educational initiatives. Programs in **Undergraduate Health Related Education** are a high priority for many Rutgers undergraduate schools. RBHS will encourage the development of new programs and the growth of existing programs, particularly those with articulation ladder opportuni-



ties for undergraduate students with interests in health professions education. Leadership for these programs will be provided by the individual undergraduate schools and programs, with support and assistance provided by RBHS, as appropriate.

Underrepresented Minority Group Pipeline Programs are a high priority for Rutgers. RBHS schools and institutes currently manage multiple successful pipeline programs. Efforts will be undertaken to coordinate and bridge RBHS programs with other university programs. Aims include: increasing the visibility of unique high-caliber underrepresented minority group programs available throughout Rutgers; increasing diversity and inclusion in the allied health, research, and policy professions through recruitment, holistic admissions processes, education, retention, and progression to the workforce; providing educational experiences that are humanistic, and culturally and linguistically sensitive; continuing to develop and enhance mentoring, role modeling, and leadership opportunities at all levels from elementary to career and workforce; and promoting collaboration across all campuses in education and research training.

Likewise, **Leadership Training** is a high priority for Rutgers. RBHS will work with the Rutgers executive vice president for Academic Affairs, who oversees leadership-training programs for faculty Rutgers-wide, and with University Human Resources for leadership training for staff.

Individual RBHS schools will direct two additional educational initiatives. A **Joint-Degree Program** initiative will enhance training opportunities for health professional students and will enable RBHS to recruit the top students, particularly as health care moves toward new models of team health care and health delivery systems. The respective schools will provide management of these programs.

Professional and Continuing Education programs are needed to strengthen professional competencies among professionals at RBHS and throughout New Jersey. To avoid duplication of effort and address the idiosyncratic nature of programmatic requirements and other issues, RBHS will no longer provide central administrative support, and individual RBHS schools will be directed to manage these programs. However, since central administration provided a level of support in the past, a hybrid management model will be developed by RBHS, in consultation with leadership at each school, until schools are able to transition into this new school-based management model.



Clinical Initiatives

The RBHS strategic plan includes several important initiatives designed to enhance our clinical enterprise. RBHS, in concert with Rutgers central administration, will review its health care marketing, communications, and **branding** strategy to create and implement a consistent and appropriate brand to be associated with the delivery of clinical services statewide, nationally, and globally. RBHS will also work to build and expand **clinical partnerships** with its two principal teaching hospitals, University Hospital in Newark and Robert Wood Johnson University Hospital in New Brunswick, and with multiple hospital systems throughout New Jersey to ensure ongoing clinical and educational opportunities for providers, faculty, staff, and students. Other initiatives include a new **accountable care organization** (ACO), the pursuit of additional ACO opportunities, and assessments of **faculty practice** plans.

Other Service Activities

Service activities are either planned or will emerge as components of many RBHS strategic plan signature programs, complementary programs, educational initiatives, and clinical initiatives. Commitment to clinical and community service has been and will continue to be integral to the missions of all RBHS schools, centers, institutes, and the behavioral health center.

Integration across RBHS Schools and across Rutgers

We are pursuing the reorganization and integration of several programs in order to create academic strength and greater efficiency within RBHS and across Rutgers. On July 1, 2014, the Rutgers College of Nursing (Newark and New Brunswick) and the Rutgers School of Nursing (legacy University of Medicine and Dentistry of New Jersey [UMDNJ]) merged to form the Rutgers School of Nursing. New Jersey Medical School in Newark and Robert Wood Johnson Medical School in New Brunswick are considering joint chair appointments and related initiatives, including sharing basic science courses between the medical schools and with the undergraduate schools.

RBHS plans to utilize its statewide geographic reach, diverse patient population, and breadth of quality, multiprofessional educational programs to develop a new faculty practice model optimally suited for the 21st century.

RBHS will work with the university to develop and coordinate universitywide center and institute policies, and multiple RBHS faculty members will serve on the Rutgers-wide Committee on Academic Unit Organization, recommended as part of the Rutgers strategic plan, to consider reorganization options with Rutgers University–New Brunswick and Rutgers University–Newark and within RBHS, specifically in regard to basic



science departments. Biomedical graduate training programs, currently existing as distinct entities at Rutgers University–New Brunswick and within RBHS, will integrate under an umbrella organization to form a proposed new division of graduate studies, which will include biomedical sciences.

Additional integration will occur with the planned expansion of the Cancer Institute of New Jersey to Newark and the new Brain Health Institute, which will bring faculty together across the university. Other integrated programs will be explored in collaboration with Rutgers University–New Brunswick, Rutgers University–Newark, and Rutgers University–Camden.

Other Enabling Structures

Three enabling structures (infrastructure) have been selected for support and investment. RBHS will work to **Advance Institutional Stature** by educating faculty, senior administrators, and Rutgers alumni regarding the criteria by which RBHS schools and programs are evaluated by national ranking publications; educating faculty on the importance of media coverage of notable research, clinical, educational, and service activities; developing a marketing and communications strategy; developing a unifying brand for RBHS health care delivery; promoting excellence in high-quality scholarship, services, and discoveries; developing signature programs; developing new standards and

criteria for faculty appointments and promotion; increasing faculty size through creation of additional faculty tracks; increasing school selectivity by soliciting applications from out-of-state students in those schools not doing so currently; and selecting one or more peer and one or more aspirant schools for in-depth study of the methods and metrics utilized and achieved by each to improve or maintain their ranking.

RBHS will provide **Faculty Development** programs, policies, and practices that ensure faculty are supported from initial appointment through retirement. A faculty retention committee developed recommendations that have been incorporated into the strategic plan, including:

- to improve faculty morale and invest in resources that support research, clinical, and teaching activities of current faculty;
- to address compensation, benefits, and other collective bargaining issues expeditiously;
- to recruit and support diverse faculty and leadership to reflect the demographic composition of local communities and New Jersey more broadly, in terms of race/ethnicity, gender, and nativity status;
- to recruit and retain faculty with interests in health disparities and cultural competencies;
- to revise and standardize faculty appointment and promotion criteria that provide guidance to faculty in choosing a pathway that will enable them to achieve their professional aspirations, maintain high standards of excellence for RBHS, and facilitate the recruitment, appointment, promotion, and retention of outstanding faculty;
- to strengthen and expand the roles of faculty affairs offices, including the tracking of and reasons for departures;
- to establish formal mentoring and faculty development programs;
- to strategically retain high-performing faculty members through the budgeting of retention packages as strategic initiatives, analogous to recruitment packages; and
- to systematically collect and compile faculty retention and separation data in each school to track trends and the success/failure of retention efforts to enhance periodic review and modification of faculty retention strategies on an ongoing basis.

There are substantial **Facilities** challenges to address. Maintenance has been deferred for too long. Some space is badly in need of repair or replacement, while other well-maintained space is underutilized. Space utilization across RBHS will be evaluated. When possible, funded investigators will be moved from poorly maintained to well-maintained space; well-maintained space also will be assigned to newly recruited investigators. Over time, as additional funding becomes available through more intensive use of well-maintained space and improvement in the function of the clinical enterprise, resources will be mobilized for space renovation.

Financial and Development Strategies

Many operational, programmatic, and financial challenges and opportunities remain following the integration of Rutgers and the former UMDNJ. A series of strategies have been and will continue to be implemented across RBHS. In addition to those being introduced through clinical initiatives and enabling structures, strategies will include: review of staffing levels and implementation of position approval controls; review of research support infrastructure to ensure efficiency; leveraging state funding for fringe benefits more effectively; holding

department chairs and division directors accountable for improving financial performance; recruiting leaders as permanent deans to replace interim deans; and analyzing revenue-cycle and collection rates for strategic opportunities.

Strategies also have been and will continue to be developed to fund the strategic plan. Some initiatives will be supported in the first year by funds contributed by each RBHS entity (representing 2% of each entity's revenue) to a chancellor's account and additional funds provided directly by each RBHS entity through reserves set aside within its budget to support school-specific and RBHS-wide programs as each entity chooses (representing 5% of each entity's revenue). In future years, the former will be replaced by a strategic fund to be made available through responsibility center management. RBHS also will take advantage of the alignment of RBHS and Rutgers strategic initiatives to fund some of its priorities, such as Henry Rutgers University Professors and Henry Rutgers Term Chairs. Finally, the New Jersey Health Foundation will provide pilot funds to support RBHS signature programs and a major reorganization of development across Rutgers and the Rutgers University Foundation will occur to enhance fundraising for RBHS.

THE PLANNING PROCESS

The Rutgers Strategic Plan and the Context for the RBHS Strategic Plan

Rutgers, The State University of New Jersey, comprises Rutgers University–Camden, Rutgers University–Newark, Rutgers University–New Brunswick, and a health care division, Rutgers Biomedical and Health Sciences, which spans the three primary universities and other satellite locations throughout the state. RBHS is aligned academically with Rutgers University–New Brunswick.

RBHS focuses on biomedical and health care education, research, clinical care, and improving access to health care and reducing health disparities. Characteristics that distinguish RBHS include postgraduate training for residents, continuing education, hospital and clinical affiliations, and the provision of health care services to the community. RBHS also has access to resources that are less or not available at the geographically based universities: clinical and grant revenues, funds provided by grateful patients and disease-specific philanthropic organizations, continuing education course revenue, technology transfer, and public-private partnerships. For a full description of all the RBHS units, see page 70.

The Rutgers strategic plan, approved in January 2014, is a five-year action plan for the achievement of excellence. It identifies the universitywide aspiration, unites the broader Rutgers community behind a common vision and values, and lays out high-level strategic priorities to guide chancellor-level planning. The four divisions were charged with developing their own strategic plans that address the themes outlined in the Rutgers plan and identifying specific initiatives and resources to support them.

The RBHS strategic plan, guided by and building upon the university’s plan, will address the Rutgers aspiration to be recognized as one of the nation’s outstanding public research institutions; all initiatives focus on Rutgers’ core missions of teaching, research, and service. Many of Rutgers’ integrating themes provide the framework for RBHS initiatives, including local and global culture, diversity, and inequality (i.e., respecting cultural differences and diversity, while minimizing inequalities); improving individual and population health* and wellness; and conducting interdisciplinary research through innovation, engineering, and technology to address sustainability challenges. Further, two of Rutgers’ strategic priorities are particularly relevant and central to the RBHS plan: building faculty excellence and enhancing public prominence.

Many elements strongly influenced the development of the RBHS strategic plan, including:

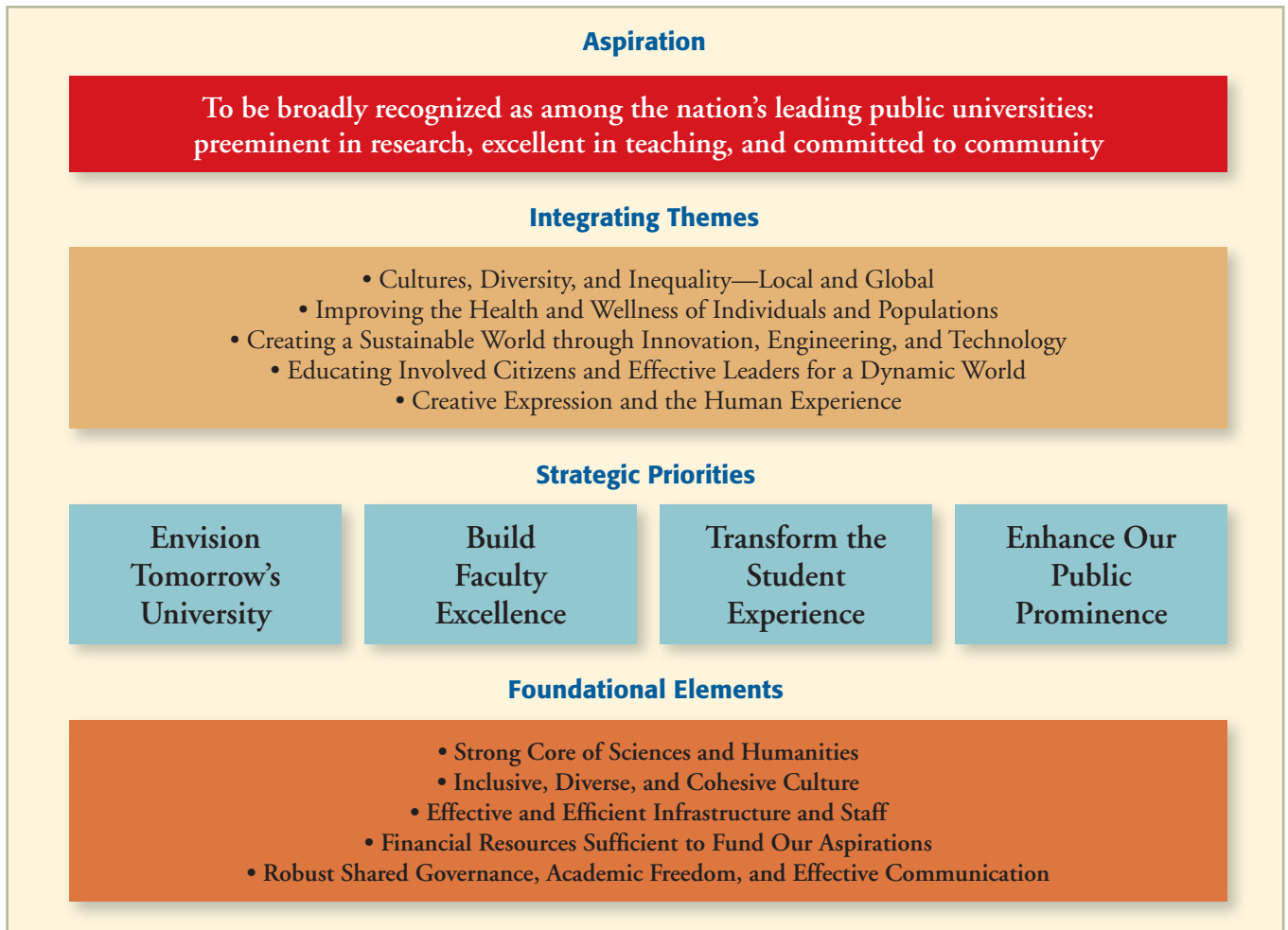
- the dramatically changing health care environment;
- RBHS’s current standing and strengths relative to its peers and aspirant institutions; and
- the goals of the New Jersey Medical and Health Sciences Education Restructuring Act, the 2012 legislation that led to the integration of Rutgers and many units of the former University of Medicine and Dentistry of New Jersey (UMDNJ).

Goals that provided direction for the strategic plan included a desire to:

- focus on health-related initiatives that cut across schools/ programs and enable RBHS to become greater than the sum of its parts;

* For purposes of the RBHS strategic plan, population health is defined as: “the health outcomes of a group of individuals, including the distribution of such outcomes within the group” (Kindig DA. (2007) Understanding Population Health Terminology. *Milbank Quarterly*, 85(1), 139-61). The key concept is that providers accept responsibility for maintaining the health of a defined population, as opposed to responding only to individuals who seek care when sick. As such, providers—not just insurers—assume risk for whole populations.

The Rutgers strategic plan in overview



- integrate across Rutgers and bring together RBHS and other Rutgers faculty with appropriate expertise and common interests;
- provide resources as needed to support existing gaps;
- utilize a planning process that was broad-based, inclusive, and transparent; and
- include both RBHS and non-RBHS faculty to ensure that health-related collaborative opportunities across the large Rutgers community are considered and to ensure that RBHS plans are aligned with the Rutgers-wide plans and those of the geographic divisions.

Further, the RBHS strategic plan recognizes that excellence is required across all clinical programs because of its health care delivery mission and the need to provide comprehensive health services to local communities and New Jersey's residents. Consequently, RBHS will strive to provide excellence in primary care and in specialized clinical care services. Similarly, comprehensive excellence is essential for educational programs. Clinical and educational initiatives will be developed accordingly. In contrast, however, in considering research programs, an attempt to achieve excellence in all areas would result in none that would be truly exceptional. Therefore, research initiatives will focus on a limited number of signature programs—those capable of achieving excellence and poised to lead multi-investigator,

multi-project, and training grant applications—with the potential to be among the best in the nation.

Development of the Plan

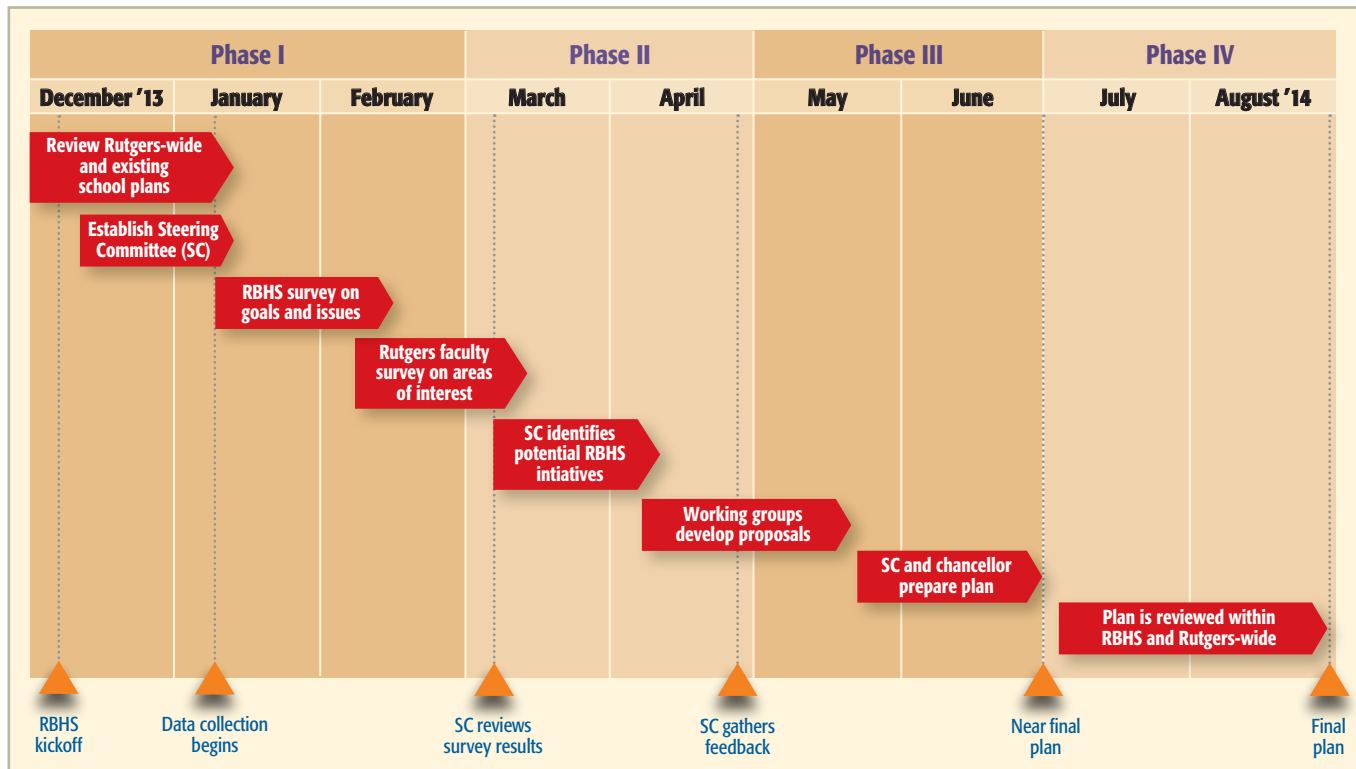
Chancellor Brian Strom announced in December 2013 the launch of the RBHS strategic planning process, to include RBHS faculty, staff, and students, with input and participation from colleagues across Rutgers and members of the RBHS host communities. Planning included committees and task forces charged with the development of initiatives and recommendations that would address research, educational, clinical, community, and public policy needs. (For more information about the process, see rbhs-stratplan.rutgers.edu/plan-background/about-strategic-planning-process.)

Multiple strategies were employed to prepare for the planning process:

- chancellor listening tour of all RBHS schools, institutes, and centers;

- RBHS strategic planning steering committee;
- analysis of data collected during the university strategic planning process;
- RBHS faculty, staff, and student survey;
- follow-up RBHS faculty, staff, and student survey;
- universitywide faculty survey;
- the future of U.S. health delivery system speaker series;
- meetings with Camden, New Brunswick, and Newark community members;
- consultations with state and federal legislators and officials;
- consultations with potential donors and industry representatives;
- meetings with clinical program directors, primary hospital partner leaders, and potential hospital and hospital system leaders;

RBHS Strategic Planning Timeline





- formation of working groups to develop proposals for potential signature programs, educational initiatives, and enabling structures; and
- consultations with RBHS deans/directors, RBHS Faculty Council, members of the Rutgers Board of Trustees, the Rutgers Board of Governors and the board's Health Affairs Committee, the other Rutgers chancellors, and President Barchi.

The 24-person RBHS Strategic Planning Steering Committee, which oversaw the process by which important academic initiatives would be developed, was comprised of RBHS school and unit faculty representatives, as well as staff, student, community, principal hospital, and other Rutgers faculty representatives. (See rbhs-stratplan.rutgers.edu/implementation/steering-committee and the following page for steering committee members and titles/appointments.) The steering committee considered the future of health care, RBHS's needs and needs throughout Rutgers, and community, state, and national needs; reviewed universitywide data and RBHS survey data; recommended the formation of **working groups to focus specifically on potential signature programs, educational initiatives, and infrastructure support needed for signature programs and educational initiatives**; reviewed proposals prepared by these working groups; and submitted recommendations for signature programs, educational initiatives, and enabling structures to the RBHS chancellor.

The working groups included more than 500 faculty members across Rutgers, including RBHS and the three universities within Rutgers. Working group members represented 240

departments/programs/units within 37 schools and institutes on the Camden, New Brunswick, and Newark campuses. (See rbhs-stratplan.rutgers.edu/plan-background/working-groups for working group membership.) **The RBHS strategic plan reflects input provided by the more than 500 working group members plus the thousands of faculty, staff, and students who responded to one or more of the surveys.**

Academic Development: Signature Programs, Educational Initiatives, Service Activities, and Infrastructure Needs

The RBHS Strategic Planning Steering Committee oversaw the activities of the 32 working groups. Twenty of these working groups concentrated on potential signature areas for RBHS. Seven working groups considered specific educational initiatives that would have the potential to enhance educational and training programs across RBHS. Each of the signature program and educational program working groups was charged with analyzing strengths and gaps in existing programs in a specific area, as appropriate, and developing a five-year plan, including recommendations designed to enhance faculty collaboration across the institution. The signature program working groups were also asked to identify the potential for RBHS to become "best-in-class" nationally.

Five working groups were formed to address specific enabling structure needs, including the specific needs and/or existing gaps based on the current RBHS and universitywide environment

Steering Committee

Robert DiPaola, *Chair*

Director, Cancer Institute of New Jersey
Professor of Medicine, Robert Wood Johnson Medical School

Joseph Barone

Dean and Professor II, Ernest Mario School of Pharmacy

David Bleich

Associate Professor of Medicine, New Jersey Medical School

Joel Cantor

Institute for Health, Health Care Policy and Aging Research
Director, Center for State Health Policy
Distinguished Professor of Public Policy, Edward J. Bloustein
School of Planning and Public Policy

Judith Cohn

Director, Health Sciences Libraries, George F. Smith Library of
the Health Sciences (Newark)

Emanuel DiCicco-Bloom

Professor of Neuroscience and Cell Biology and Pediatrics,
Robert Wood Johnson Medical School
Director, Autism Research, Brain Health Institute

Francis Dixon

Executive Director, New Hope Baptist Church-New Hope
Community Development Corporation (Newark)

Walter Douglas

Chief Operating Officer, New Jersey Medical School

C. Roy Epps

Chief Executive Officer, The Civic League of Greater New
Brunswick

Cecile Feldman

Dean, Professor of Community Health, Professor of Restorative
Dentistry, Rutgers School of Dental Medicine

Vincent Joseph

Executive Vice President, Robert Wood Johnson University
Hospital

Amoli Joshi

Student Representative, New Brunswick, Master's of Public
Health, School of Public Health

Elizabeth Ketterlinus

(Former) Interim Vice President for RBHS Development,
Rutgers University Foundation

Paul Lioy

Professor and Vice Chair, Department of Environmental and
Occupational Medicine, Robert Wood Johnson Medical School
Director of Exposure Science, Environmental and Occupational
Health Sciences Institute

Peter Lobel

Associate Director, Center for Advanced Biotechnology and
Medicine
Professor of Biochemistry and Molecular Biology, Robert Wood
Johnson Medical School

Kim Manning

Vice President, University Communications and Marketing

Theresa Miskimen

Vice President for Medical Services, University Behavioral
Health Care
Professor, Department of Psychiatry, Robert Wood Johnson
Medical School

Pamela Ohman-Strickland

Associate Dean, Associate Professor of Biostatistics, School of
Public Health

Carlos Pratt

Professor, Director of Graduate Studies in Psychiatric
Rehabilitation, School of Health Related Professions
Director, Center for the Study and Promotion of Recovery
from Severe Mental Illness

Mark Robson

Dean of Agricultural and Urban Programs, Professor of Plant
Biology and Pathology, School of Environmental and Biological
Sciences
Professor of Environmental and Occupational Health, School
of Public Health

Barbara Romig

Student Representative, Newark, Ph.D. in Health Sciences
Program, School of Health Related Professions

Althea Stillman

Postdoctoral Student;
Vice President, Robert Wood Johnson Medical School
Postdoctoral Student Association

Patricia Turiello

Director, Physician Relations, University Hospital

Suzanne Willard

Associate Dean for Advanced Practice,
Clinical Associate Professor, College of Nursing

as well as needs within divisions, departments, schools, centers, institutes, and other units. These working groups were asked to identify the potential benefit and impact on research, teaching and educational programs, clinical care, community service, and public policy, and develop a five-year plan that would include recommendations designed to benefit RBHS and/or Rutgers as a whole.

All working groups also were charged with identifying metrics and providing a timeline for the achievement of the recommendations, focusing on growth of current areas of strength, improvement of weaknesses, and opportunities. Working groups submitted interim reports to the steering committee, received feedback and direction, then submitted a final 10-page report that addressed comments and suggested changes to the interim report.

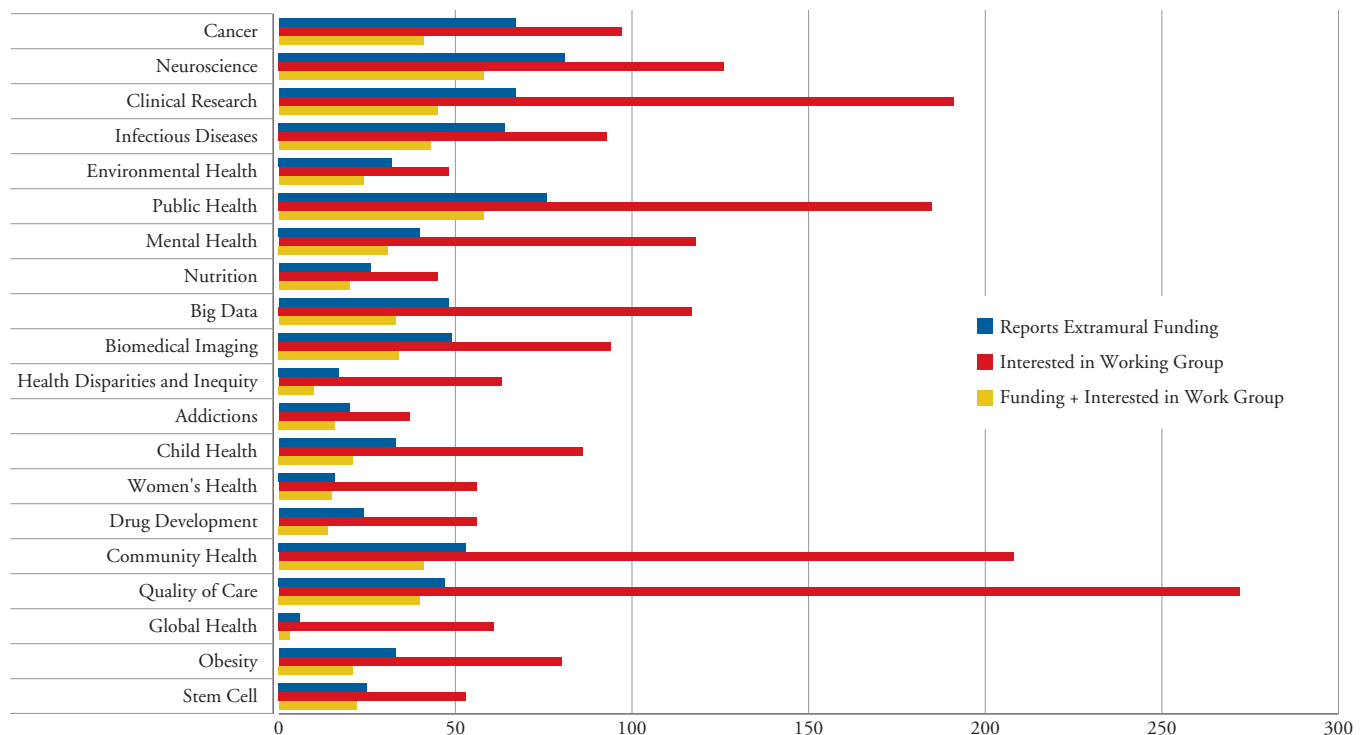
Clinical Development

The RBHS strategic planning process included meetings among the RBHS chancellor, deans and directors of clinical programs, and other leaders responsible for clinical programs. Additional

meetings were held with primary hospital partners and potential hospital and hospital system partners. Their focus was the delivery of health care, which is an integral component of the RBHS mission and is central to many RBHS programs: Cancer Institute of New Jersey, Environmental and Occupational Health Sciences Institute, Ernest Mario School of Pharmacy, New Jersey Medical School, Robert Wood Johnson Medical School, Rutgers School of Dental Medicine, School of Health Related Professions, School of Nursing, and University Behavioral Health Care. Their goal was an imperative: to maintain a standard of excellence across all RBHS clinical programs. Further, they recognized that clinical enterprises of academic health centers traditionally have subsidized the less economically viable components of the mission, particularly teaching and research. Yet, recent changes in the health care reimbursement system and the economic downturn have placed exceptional pressures on clinical revenues. Accordingly, a series of initiatives and programs were developed to improve the health of New Jersey residents and provide quality services, while addressing RBHS's financial sustainability.

Rutgers Faculty Interest in Potential Signature Areas

In a survey, Rutgers faculty identified their interest and involvement in potential RBHS signature program areas.





THE STRATEGIC PLAN

Aspiration and Identity

The RBHS strategic plan takes its cues from, and is highly aligned with, the universitywide strategic plan. While focusing on a mission, a vision, and priorities appropriate for an academic health center, the RBHS strategic plan embraces the ambition to be recognized as among the nation's leading public research institutions. The plan targets Rutgers' integrating themes, endorses Rutgers' five foundational elements, supports Rutgers' strategic priorities, and seeks to build academic strength within RBHS and across Rutgers.

RBHS's objectives in developing its strategic plan were to translate the universitywide priorities and integrating themes into RBHS's unique context, identify initiatives that would address Rutgers' overarching plan while focusing on RBHS's needs, create a funding strategy to support its initiatives, and construct specific metrics to measure the success of the RBHS initiatives.

Of specific relevance for RBHS are the themes of cultures, diversity, and inequality—local and global (i.e., respecting cultural differences and diversity while minimizing inequalities); improving the health and wellness of individuals and populations; and creating a sustainable world through innovation, engineering, and technology. The strategic priorities that resonate academically build faculty excellence and enhance Rutgers' public prominence.

A Mission and a Vision

RBHS's objectives are reflected in its aspiration and identity statements, each endorsed by a large majority of the faculty.

Aspiration

RBHS aspires to be recognized as one of the best academic health centers in the U.S., known for its education, research, clinical care, and commitment to improving access to health care and reducing health care disparities. This will be achieved through dedication to elevated standards of excellence and innovation, interprofessional collaboration and integration, and deep engagement with the community.

Identity

RBHS leads Rutgers' efforts to be a state, national, and international leader in the biomedical and health sciences and their related professions. The approach incorporates insights from laboratory sciences and the clinical, behavioral, public health, and social sciences, as well as from non-health care disciplines, including business, economics, engineering, law, the arts, and the humanities. RBHS will advance population-based, value-driven health care by building on its recognized clinical and research excellence, engaging with local and global communities, taking advantage of and strengthening its uniquely diverse workforce, and realizing interprofessional synergies among its

The RBHS strategic planning process identified four initial signature programs, one emerging signature program, four complementary programs, seven educational initiatives, and enabling initiatives to provide infrastructure support for these programs and initiatives. These programs and initiatives will enable RBHS to achieve its aspiration to be one of the leading academic health centers in the U.S. and support Rutgers' strategic priorities. The signature programs, emerging signature program, and complementary programs also address two points of emphasis in the Rutgers strategic plan: strengthening selected programs while sustaining quality; and targeting academic excellence by recruiting, retaining, and supporting outstanding faculty.



schools and institutes. Further, RBHS will strengthen its many professional ties with state and federal governments and foster new public-private partnerships with industries critical and vital to New Jersey's economy.

RBHS will achieve its aspiration and become recognized as declared in its identity statement through the implementation of its five-year strategic plan. Specific initiatives address RBHS academic programs, faculty, clinical programs, finances and development, and infrastructure.

Signature Programs

Cancer

Rutgers is extraordinarily well placed to develop an outstanding program in translational research in cancer, including research in tobacco. The goal is for this program to become among the best in the U.S. The unified Rutgers Cancer Program, under the auspices of Rutgers Cancer Institute of New Jersey, has a statewide catchment area. The Cancer Institute is New Jersey's only National Cancer Institute (NCI)-designated comprehensive cancer center. Since inception, the institute's membership and expertise have broadened across the Rutgers continuum, and it has forged collaborative relationships with Princeton University and the Institute for Advanced Study in

Princeton. The institute's membership now spans 14 Rutgers schools and institutes. It has strength in basic, population, and clinical research in cancer and its current research programs have translational targets.

In 2014, the institute's research program generated approximately \$70 million in grant support, with more than 700 publications. The translational research program includes critical niches that enable it to achieve national prominence, including efforts in precision oncology: conducting clinical trials that provide genomic assessment leading to personally guided therapies for patients based on their cancer's characteristics. The institute conducts precision oncology work in collaboration with Rutgers University Cell and DNA Repository (RUCDR) Infinite Biologics. It is anticipated that future collaborative activity in this regard will also include the planned Institute for Quantitative Biomedicine at Rutgers (Rutgers–New Brunswick).

The Cancer Institute's Early Phase Clinical Trial Program is top-ranked, having received highly competitive funding from the NCI and the Department of Defense. The institute has also received long-term funding from the NCI Cancer Therapeutics Evaluation Program and now leads one of the nation's early therapeutic clinical trials network sites. Clearly, Rutgers Cancer Institute is benefiting the state through acquisition of federal funding and the population by providing state-of-the-art opportunities, and is now positioned to further enhance the state and university.

The RBHS signature cancer program, to be led by the Cancer Institute director, will take advantage of the institute's programmatic structure, tobacco control research at the School of Public Health, and the complementary programs in clinical research, drug development, informatics, and public health. The program will enhance team science through a series of targeted initiatives:

- changing the culture and at the same time eliminating silos;
- developing funding mechanisms to enhance collaboration and "prime" multi-investigator projects and funding vehicles;
- identifying and recruiting key faculty who will both increase the "breadth and depth" and provide guidance to vitally important team science grants such as P01s and SP0REs; and
- building and supporting key infrastructure, including shared resources and staffing, to ensure success of the plan.

The cancer program will also expand to enhance research and patient care statewide, including at RBHS in Newark. The integration of the Newark clinical programs into the institute's network will make clinical research programs and trials available to a more diverse population. Incremental investment will be needed to provide pilot funding to generate preliminary data, provide protected time for enhanced research productivity, recruit new faculty, and support critical infrastructure development and use.

Implementation of these targeted initiatives will be driven by a collaborative deliberation and assessment process by key stakeholders. Assessment of infrastructure will ensure that appropriate resources are available. First, a top to bottom review of existing shared resources will be conducted. Second, necessary new and shared resources will be identified. An initial review has identified, for example, some specific needs: tissue banking, informatics, and analytic and synthetic chemistry.

Proposed Initiatives

Year 1:

- A Strategic Plan Implementation Committee will be established to oversee the program.
- The first series of affinity groups across the Rutgers continuum will be identified.
- Initial mini-retreats will be held.
- An analysis of shared resource use and a user survey will be completed.

Year 2:

- The first series of group retreats will be assessed to identify competitive goals and needs.
- Potential areas of research will continue to be identified.
- A Request for Application will be released to announce the availability of funding for high-quality team pilot projects.
- Critical faculty recruitments needed to enhance current and future programs will be identified.
- The recruitment process for identified faculty positions will begin.
- Critical requirements for new shared resources will be identified.

- A plan will be developed to allow for the use of these shared resources in obtaining data needed in support of team/translational applications for funding.

Years 3–5:

- Ongoing team programs will be monitored.
- Potential new areas will be considered, evaluated, and, when appropriate, supported.
- Nonproductive and noncompetitive teams will be eliminated.
- Use of overall shared resources and infrastructure will be evaluated.

The goals and metrics for the translational research in the cancer program will include:

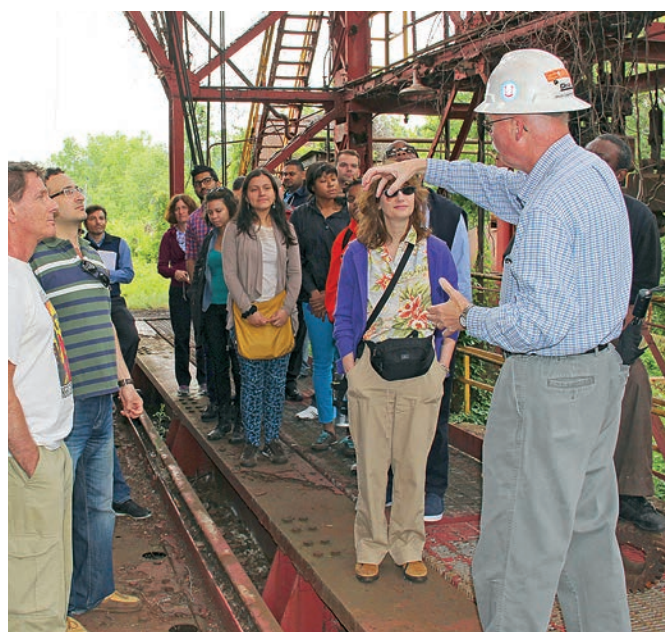
- support for the development of a world-class funded team of translational researchers;
- breaking down silos and building teams assessed by increased collaboration, multi-PI high-impact papers, and externally funded multi-PI grants;
- developing a translational pipeline from Rutgers basic science to clinical trials assessed by increased investigator-initiated early phase trials; and



■ translating public health and tobacco studies from population studies to change in policy.

Discussions are ongoing across Rutgers and Princeton to identify collaborative areas, faculty assets, and requirements that will lead to the submission of institutional training grants (NIH T32 and R25 level mechanisms, in addition to grants from other agencies) as well as a number of multi-PI collaborative applications. As outlined in the strategic plan, significant incremental resources will be required for recruiting new faculty and providing support for infrastructure and critical seed funds to “prime” collaborative grant applications. With these in place, targeted applications such as R25 proposals are anticipated for submission. One would be submitted in the first 18 months and a total of three more would be submitted within the next three and a half years.

Currently, four T32 training grants active with cancer center PIs focus on cancer-related areas. One cancer-focused T32 grant proposal will be submitted in the first two years of the program with an additional two more by year 5. Currently, no active multi-investigator P01 or SPORE grants exist within the cancer program. A skin SPORE application will be submitted by the end of year 2 and a second (prostate cancer) by the end of year 5. With added funding, a P01 grant proposal will be submitted by the end of year 2, and two additional P01s will



be submitted by the end of year 5. To facilitate SPORE, P01, and multi-PI R01-level grants, one SPORE and two collaborative program retreats have been scheduled in the next three months. These retreats will focus on identifying current collaborators, faculty recruitment needs, and funding requirements for preliminary data.

The Cancer Institute currently leads 79 open therapeutic trials; six are peer review-funded and an additional 19 are investigator-initiated. It is expected that overall investigator-initiated and externally peer-reviewed grants will be increased by 25% within two years and by 50% by year 5.

Environmental and Occupational Health

Rutgers is now among the most prominent university-based groups in environmental health, occupational health, risk assessment, exposure science, and toxicology (hereafter referred to as environmental health) in the U.S., and initial steps have been taken to be among the top globally. Between 2008 and 2013, Rutgers faculty members published more than 1,200 articles in environmental and occupational health, with many being joint publications indicative of interdisciplinary and collaborative research. Faculty have published in high-impact journals across a variety of fields, including: *Science*, *Nature*, *JAMA*, *Neurology*, *Risk Analysis*, *Environmental Science and Technology*, *Environmental Health Perspectives*, and *American Journal of Public Health*. Based on this number of publications in occupational health, Rutgers would be ranked second among peer institutions and first among Big Ten institutions. Based on the number of publications during those years in environmental health, Rutgers would be ranked third among peer institutions and second among Big Ten institutions.

Rutgers faculty members have received substantial research funding in environmental and occupational health from federal, state, nonprofit, and industrial sources. Since 2008, faculty garnered more than \$22 million in research grants from the National Institute of Environmental Health Sciences and an additional \$98 million from other NIH institutes on projects related to environmental and occupational health. Other federal agencies, such as the CDC, Department of Energy, EPA, Federal Aviation Administration, Housing and Urban Development, National Institute of Occupational Safety and Health, Federal Emergency Management Agency, Department of Homeland Security, and NSF have funded environ-

mental and occupational health research in excess of \$37 million. Additional funding has also been received from the State of New Jersey, foundations, and industrial sources to address specific problems or issues.

Of the 22 resident Environmental and Occupational Health Sciences Institute (EOHSI) faculty, 19 receive extramural funding, and five of the six Edward J. Bloustein School of Planning and Public Policy faculty who have interests in this area receive extramural funding. Additional faculty members receive extramural funding from other sources to support their work in environmental and occupational health.

These and other factors, including the number of Rutgers faculty who have received lifetime achievement awards from the Society for Risk Analysis and the International Society of Exposure Science, and the number of faculty who have served as editors or assistant editors for national journals, document the strength of environmental and occupational health at Rutgers. The program's advantages originate in the talents of the scientists and research groups that have built strong specialty areas, e.g., asthma. This expertise has been enhanced by adapting an interdisciplinary model integrating environmental health with law, policy and planning, nursing, engineering, and other disciplines across the university.

Proposed Initiatives

■ Hire a visionary director for EOHSI who will lead this RBHS signature program and work collaboratively with the complementary programs in clinical research, drug development, informatics, and public health. This step will send a message to the scientific community within and outside Rutgers that RBHS has made a major commitment to environmental health. The new director's primary goal should be to bring faculty together and support research in environmental health across different departments, programs, and schools. This will include deepening the core strength within EOHSI and extending the impact of EOHSI to include faculty across Rutgers interested in environmental health. Over the next five years, it is anticipated that new U.S.-centric and global environmental and occupational health initiatives will be developed jointly across schools and departments led by the new director of EOHSI and a university committee to be created (see below) to maintain Rutgers' leadership in the field.

Each of the signature programs intends to create a multidisciplinary research environment, foster collaborative research, and obtain multi-investigator research grants.

■ Establish a universitywide committee in academic year 2014–15 to coordinate and facilitate productive interdisciplinary and interprofessional programs in environmental health. The committee should have a broad mandate, including maintenance and enhancement of Rutgers' status as a national leader in environmental health and, specifically, brainstorming, hiring, and joint fundraising for interdisciplinary research. Initially, the committee should provide input into the search for a new EOHSI director. Ultimately, the committee should be chaired by the EOHSI director.

■ Recruit junior faculty in at least some of the following key areas of existing strength: exposure science, environmental epidemiology, environmental toxicology, epigenetics, environmental engineering, and risk analysis. These are needed to fill existing gaps and replace senior faculty likely to retire in the next five years. In addition, recruitment and investment are needed in two emerging areas within environmental health: individual susceptibility to environmental disease and nanomaterial impact on environmental health. These emerging areas will include existing researchers from multiple Rutgers departments that can be broadened with additional collaborations from the complementary areas and new recruitments, as well as from other departments and schools. A major five-year goal is to develop Rutgers-wide initiatives to obtain multi-investigator grants, center grants, program project grants, and investigator-initiated grants.

■ The committee should be permanent, meet regularly, and generate an annual report of activities in environmental health, outlining progress toward quantifiable metrics. These metrics would include success in grant funding, research, highly cited publications, recruitment, education, and international leadership. It is anticipated that grant funding would increase by 20% annually during the next five years. Two new



multi-investigator/program projects will be developed and submitted for funding over the next five years. Research will lead to two highly cited publications every other year. Five faculty members will be recruited over the next five years, three new interdisciplinary courses will be developed to meet the educational requirement of this evolving field, and international leadership will be demonstrated by the development of a new global initiative in a developing country.

Infection and Inflammation

Infectious and inflammatory diseases are among the leading NIH-funded areas of research excellence at Rutgers, which ranks well among other members of the Committee on Institutional Cooperation (CIC) and institutions of national recognition. The newly established Institute for Infectious and Inflammatory Diseases (I³D) brings together Rutgers faculty from various schools, departments, and centers on multiple campuses. This interprofessional institute will promote seamless communication, including state-of-the-art technological capabilities for seminars and other presentations. Faculty members with these interests have also obtained sponsorships from industry and other sources for recent and upcoming retreats and symposia.

Publication by Rutgers faculty with interests in infectious and inflammatory diseases is highly competitive with other CIC members, both in total publications and also when expressed relative to all publications from 2008 through April 2014 for each institution. Further, approximately 80 Rutgers faculty members currently receive NIH funding for research in infectious and inflammatory diseases. Over the last five years, the total NIH funding of Rutgers faculty engaged in infectious disease and inflammation research was nearly \$150 million. Additional faculty members receive extramural funding from HRSA, CDC, and other sources. With appropriate investment, Rutgers is poised to become a top institution in this area compared to the public top-tier institutions included in the CIC and to private institutions with strong reputations nationally.

Particular strengths exist in host-microbe interactions, immunopathology, and global health; these research programs actively compete with the leading schools in the country to recruit outstanding faculty. These attributes and established reputation provide a strong platform for building this signature area of research excellence. By working together with other signature programs and the complementary areas in informatics, drug development, and public health, the infectious and inflammatory diseases faculty can use this potent research program as leverage to develop partnerships with industry and to seek philanthropic contributions. In fact, the process of initiating

collaborative partnerships and identifying funding sources is actively occurring within this signature area. As such, a foundation is in place to further promote and develop this established area of excellence at Rutgers. Further, scientists in these areas are confident that with targeted investments and institutional support, Rutgers can become one of the top institutions in infectious and inflammatory disease in the country.

Proposed Initiatives

■ New faculty will be recruited to facilitate continued growth of external grant support, increased publications in high-impact journals, and the generation and commercialization of intellectual property (IP). Recruitment will include: outstanding junior/mid-level research faculty with expertise in infection and immunity focusing on targeted research areas of host-microbe interactions, immunopathology, and global health (within the first three years); and outstanding senior- or mid-level clinical scientists who can lead research programs in clinical/translational research and/or possess expertise with clinical trials (within the first three years). These recruitments will be conducted in close collaboration with the complementary areas through the recruitment of faculty members with joint appointments to facilitate maximal synergy between the signature area and each complementary program.

■ To encourage and reward interprofessional collaboration, this program will: seek to move faculty with common interests to a common location in Newark (including NJMS, RSDM, and SON faculty) and New Brunswick (RWJMS) to generate the critical mass needed for the development of increased multi-investigator grants, including center grants and program project grants (by year 5); establish a strong internet connectivity network with all Rutgers faculty engaged in research in this signature area of research excellence (end of year 1); establish yearly retreats for Rutgers faculty in this signature area to share findings and develop novel ideas; work closely with the Office of Technology Commercialization to generate IP portfolios and establish broad partnerships with pharma/biotech companies to promote collaborative projects that can enhance IP development and commercialization (by year 4); and financially support collaborative efforts with internal grants of at least \$100,000 per project, particularly for the purpose of seeding multi-investigator grants (applications for these grants should be submitted within the first year and funding should commence by the second).

■ To develop state-of-the-art resources, the program proposes to: develop new core facilities for metabolomics, bioinformatics, and clinical research/trials units (with proper funding, these new cores could be established in two to three years); upgrade/maintain equipment in existing core facilities, specifically the flow cytometry core at NJMS and a new satellite flow core facility in New Brunswick/Piscataway (three years); upgrade the animal facilities at RBHS in New Brunswick and Newark (three years); introduce sustained efforts to raise funds in this signature area of research excellence from private donors in New Jersey and nationally (one year); and hire an administrative assistant in the I³D to facilitate collaborations, help develop internet connectivity, support multi-investigator cross-campus grant initiatives, and interface with the Rutgers University Foundation (one year).

A combination of internal and external funding sources is necessary to support these initiatives and make Rutgers one of the top institutions nationwide in this rapidly growing area of research excellence. To ensure the successful implementation of the proposed initiatives, the signature area strategic team will meet monthly over the next five years to evaluate the impact of implemented actions, measure outcome metrics, and identify new action items or evolving strategies. Similarly, the strategic team will meet frequently with leaders of the complementary areas in informatics, drug development, and public health to



promote collaborative growth and maximize resources within the Rutgers community. In fact, the process of meeting with these leaders to develop an action plan is already under way.

The outcome metrics will include NIH grant funding; publications, particularly in high-impact journals; generation and commercialization of intellectual property; and national and international recognition of faculty accomplishments. It is anticipated that with proper resources, current levels of NIH funding could be increased from \$150 million to \$200 million during the next five years (cumulative). As junior faculty become established during the five-year period, grant funding is expected to continue to rise and potentially reach \$300 million in six or seven years (cumulative).

It also is anticipated that the number of publications in high-impact journals (defined as having an impact factor of 8.0 or higher) will increase. This is readily measurable and will be tracked throughout Rutgers and assessed yearly. Measures of faculty reputation will also include number of invited talks to be delivered at national and international conferences/meetings and other research institutions. To track intellectual property growth, patent applications, and licenses, revenue will be assessed quarterly with assistance from the Office of Technology Commercialization.



Neuroscience

The goal of the neuroscience initiative is to create a nationally recognized center of research into the biological bases of brain function and dysfunction in the service of providing new treatments for common nervous system disorders. Areas of focus will include:

- neurodevelopmental disorders (autism spectrum disorder and schizophrenia);
- neurodegeneration and nervous system injury (multiple sclerosis, Parkinson's and Alzheimer's diseases, spinal and brain injuries);
- cognitive and sensory disorders; and
- motivational disorders (addiction, obesity).

Funding to support this program will be sought from the NIH BRAIN initiative and other public and private entities.

The program will be led by the director of the new Brain Health Institute (BHI), which will be the home for this initiative. BHI was created in 2013 as a Rutgers University–New Brunswick and RBHS partnership. BHI will work collaboratively with other Rutgers entities with appropriate neuroscience interests to achieve the program's objectives. These include the to-be-created Rutgers University Consortium in Autism and the Center for Molecular and Behavioral Neuroscience (Rutgers University–Newark). BHI will also work with Rutgers–New Brunswick to hold a conference on computational cognitive neuroscience, planned for FY 2015, to which national experts who utilize biological, psychological, and computational approaches to conduct brain research will be invited.

The selection of the focus areas was based on an analysis of strengths at Rutgers currently, as well as the recognition of common nervous system disorders needing novel treatments. An analysis of publications from Rutgers faculty over the past five years in neurodegeneration, dysfunction, and aging revealed 103 papers related to Parkinson's disease, 101 papers related to Alzheimer's disease, and 90 papers related to multiple sclerosis. Of these, Parkinson's disease and multiple sclerosis were identified with the greatest strength in grant funding, with 11 grants focusing on Parkinson's disease (est. \$6.4 million) and 24 on multiple sclerosis (est. \$10.1 million). Three grants focus on Alzheimer's disease (\$1.6 million), and other investigators are

studying processes related to central nervous system degeneration and aging (19 PIs; 28 grants) or adult brain function (19 PIs; 32 grants). Several clinical trials were identified in the fields of multiple sclerosis and Parkinson's disease.

Analysis of publications from Rutgers faculty over the past five years in loss of neural function during development revealed 37 papers in the area of autism and 54 papers in schizophrenia. Forty-one currently funded or recently closed grants associated with this sub-area were identified: 15 grants directly related to autism (est. \$10.5 million) and seven grants (est. \$5.4 million) directly related to schizophrenia. Additional investigators are studying processes related to developmental disorders or injury (15 PIs; 19 grants). The State of New Jersey also supports grants in autism, including one program project grant, indicating its endorsement of this area.

Analysis of publications from Rutgers faculty over the past five years in loss of neural function after injury revealed 77 papers in spinal cord injury, 45 in brain injury, and 113 in stroke. The greatest strengths in grant funding were in spinal cord injury and traumatic brain injury. Eighty-five currently funded or recently closed grants in this area were identified: 50 directly related to spinal cord injury (est. \$18.1 million) and 16 related to traumatic brain injury (est. \$12.3 million). The remaining grants encompassed more general themes within strategies to promote regeneration (8 PIs; 19 grants). The State of New Jersey has supported a number of the grants on both spinal cord injury and traumatic brain injury (TBI), including two program project grants on traumatic brain injury (both basic and clinical studies). Several clinical trials and private donations were identified in spinal cord injury.

Comparisons of publications in these areas of strength were conducted with peer institutions in New York, Connecticut, Philadelphia, and New Jersey, as well as institutions in the Big Ten. In the area of Parkinson's disease, Rutgers ranked fifth in publications regionally and fourth in the Big Ten. An analysis of multiple sclerosis-related publications revealed that Rutgers already is "first in class" both regionally and in comparison to the Big Ten. In spinal cord injury, Rutgers ranked fourth regionally and sixth in the Big Ten in publications. An analysis of publications associated with TBI revealed that Rutgers is fifth both regionally and in the Big Ten. Spinal cord injury, traumatic brain injury, and autism are particularly attractive because the State of New Jersey supports commissions on spinal cord



injury (the New Jersey Commission for Spinal Cord Research) and brain injury (the New Jersey Commission for Brain Injury Research). Additionally, the Governor's Council on Medical Research and Treatment of Autism has provided significant grant funds to Rutgers faculty.

Other clinical areas with limited therapies are ripe for development at Rutgers. Cognitive neuroscience is the study of brain mechanisms of high-level mental function that are critical for human experience but are primary contributors to the morbidity of many neural disorders including Alzheimer's and Parkinson's diseases, autism, and schizophrenia. Rutgers' strengths in cognitive neuroscience can be linked to extensive expertise in behavioral neuroscience and neuroimaging. Development of new therapies for these disorders requires an understanding of complex cognitive phenomena and the way in which altered neural function gives rise to cognitive deficits in such diseases. Motivational disorders also rank high in the need for new clinical treatments. Addiction and obesity are rampant nationally and internationally, but little is known about the brain substrates that lead to these disorders. Strengths at Rutgers in both of these and related areas indicate that further development would be fruitful for developing novel treatments for these disorders. New therapies require research focused on mechanisms of motivated behavior, which are at the root of these problems.



A further focus for BHI will be to utilize new techniques in basic neuroscience to develop novel therapies for brain and spinal disorders. Over the past seven years, developments in viral vector neurotransduction, optogenetics, and chemicogenetics (designer receptors), among other areas, are revolutionizing neuroscience. These new methods have proven effective in altering brain function and dysfunction in animal models, indicating that such methods may lead to a new generation of neurotherapeutics. Indeed, viral vectors are already being used in clinical trials to treat Alzheimer’s and Parkinson’s diseases by expressing growth factors to halt degeneration of neurons in the basal forebrain and midbrain. Similar viral vectors can be used to express opsins or designer receptors in a cell type-specific manner to allow control of selective populations of brain or spinal neurons with unprecedented specificity. This will allow for the development of new therapies, based upon knowledge from basic neuroscience research, with many fewer side effects compared to almost any current treatment. Rutgers can take the lead in this effort.

The neuroscience initiative’s ultimate mission will be to unite and expand the large Rutgers neuroscience community and become “best in class” nationally within the identified focus fields. The program will have three major goals:

- **to create research programs** focused on the biological underpinnings of healthy central nervous system functions and dysfunctions associated with the above disorders;
- **to develop new treatments** for these disorders based upon this research and new neuroscience tools; and
- **to establish a rich neuroscience resource in New Jersey** that educates the public, clinicians, faculty, and students, as well as state, national, and international health officials.

By studying different disorders in parallel, we can identify commonalities for the underpinnings of disease. Moreover, the new neuroscience techniques that will be used as the basis for novel neurotherapeutics will be applicable across all of these and other neural disorders. The goal is to identify the genetic, environmental, and other aspects related to neuropathology and repair so that effective strategies can be developed for prevention and treatment.

The newly formed RBHS complementary programs will provide significant synergies. The informatics group will assist in state-of-the-science imaging data acquisition and storage as well as with increased communication capabilities. The clinical research group will support the development of a clinical and translational science award that will support clinical trials arising from basic research. The public health group will advise in the fields of epidemiology, biostatistics, and quantitative methodologies. The drug discovery group will assist in target identification, which will fuel translational research and coordinate institute studies with New Jersey biopharmaceutical companies and the Rutgers Biopharma Educational Initiative.

Proposed Initiatives

Year 1:

- Recruit a leader for the Brain Health Institute, who will also serve as leader of the RBHS signature program.
- Begin recruiting senior faculty (ideally, one for each identified focus area) with established track records of extramural funding to provide leadership for each initiative sub-area (faculty to arrive by year 2).
- Establish administrative support for the program.

■ Evaluate and plan for state-of-the-science imaging at needed sites and other needed cores (supported by equipment grants by faculty and a Rutgers campaign to raise funds), which will be monitored by core directors with the goal of becoming self-sufficient from user fees by years 2–3.

■ Strengthen alliances with principal teaching hospitals (level 1 trauma centers at University Hospital in Newark and Robert Wood Johnson University Hospital in New Brunswick, Kessler Rehabilitation Institute, JFK Johnson Rehabilitation Institute, and Children’s Specialized Hospital) by identifying one collaborating faculty member affiliated with each site who will work with the institute leadership to promote identification of research questions and recruitment of clinical trial participants from this site (descriptive statistics of participant involvement from each site and faculty input from each site will be collected to monitor the effectiveness and strength of these alliances).

■ Establish stronger liaisons with the biotech and pharmaceutical industry in collaboration with the drug development and clinical research complementary programs (biotech and pharmaceutical companies will be introduced to the institute through an invitational meet-and-greet at the institute faculty and staff open house, followed by designation of a Rutgers drug development faculty member to be the ambassador of the institute to that company regarding drug or biotech research and development).

■ Several steps will be taken to facilitate communication. One- to two-day strategic planning conferences will be conducted. These will include faculty, staff, students, and multidisciplinary collaborators from various Rutgers schools; community and professional organizations; foundations; and governmental agencies. Teams will be developed for each of the focus areas to advise on goals, objectives, and outcome measures. Processes will be put in place, including telecommunication capabilities from all sites, to coordinate communication among international, national, and state educational, clinical, and research neuroscience programs, using the expertise of IT and in collaboration with public health experts. A website will be developed with a virtual resource center along with directory of all staff, faculty, clinicians, and researchers involved in the program. A Telehealth Grand Rounds neuroscience seminar series will be planned to bring leaders external to Rutgers to speak and meet with Rutgers scientists in the BHI areas of focus.

The mission for each of the signature programs is to unite and expand the large Rutgers community focused on their specific area of interest and become “best in class” nationally.

Year 2:

■ Recruit the first group of junior faculty hires to fill some of the gaps in viral vectors and plasmids, cognitive neuroscience, motivational neuroscience, genetics, neuropathology, imaging, clinical research, and translational research especially in the area of drug development (faculty to arrive in years 2–3).

■ Establish an internal neuroscience study section to support new grant applications.

■ Establish a pilot grant mechanism that funds collaborative projects.

■ Form affinity groups to enhance collaborations across campuses and with external entities.



- Apply for federal, state, and private foundation grants to fund individuals, multi-PIs, and training grants.
- Establish an endowed one-year fellowship to support post-neurology residency training of physician-scientists and a three-year endowed fellowship to support training of an MD/PhD student.
- Establish strong drug discovery teams to foster translational/clinical trials in collaboration with the drug development and clinical research complementary programs.
- Establish access to core resources in key areas such as biostatistics, epidemiology (public health complementary program), data management, clinical trials (clinical research complementary program), and bioinformatics (informatics complementary program).
- Provide regularly scheduled Telehealth Grand Rounds for neuroscience researchers, clinicians, educators, and advocates within the BHI.
- Organize symposia on each of the areas of focus with invited expert speakers (the director will meet with the president of the New Jersey chapter of the Society for Neuroscience, public health professionals, as well as with other stakeholders to discuss how outreach activities can be best coordinated).



- Identify continuous quality indicators for best practices in clinical care, education, and quality of life for persons with neurodegenerative conditions, neural injury, motivational or cognitive disorders, and neurodevelopmental disabilities.

Year 3:

- Continue to recruit faculty hires to fill gaps in viral vectors and plasmids, cognitive neuroscience, motivational neuroscience, immunology, genetics, neuropathology, imaging, clinical research, and translational research, especially in the area of drug development; continue to apply to NIH for individual (R01, R21), training (T32, F30), program project (P01), exploratory (P20), specialized center (P50), and center core (P30) grants from the relevant NIH institutes (at least 20 NIH grant applications per year, including all institute, individual, training, and collaborative grants).
- Formulate state and national policy efforts to address earlier screening and evidence-based diagnosis of neurodevelopmental disorders (autism), as well as earlier recognition of neurodegenerative and neural injury disorders.
- The Brain Health Institute director and/or program faculty will serve on state, federal, and international committees by the end of year 3.

Year 4:

- Develop curricula and training guide toolkits for pre- and post-graduate health profession education regarding cognitive function and dysfunction, motivational disorders (addiction and obesity), neurodegeneration, neurodevelopmental disorder, and neural injury diagnosis and care (faculty development for this curricula development starts in year 1 or 2).
- Designate policy center faculty to serve as experts for local, state, national, and international consultation.
- Continue applying for individual (R01, R21) and collaborative NIH grants (P01, P20, P50, P30) and for centers of excellence grants directed to autism, multiple sclerosis, Parkinson's disease, spinal cord injury, and traumatic brain injury, where available.

Year 5:

- Submit an application for an NIH-funded comprehensive center grant (P60).



- State, national, and international policy will be set to increase earlier screening, diagnosis, and referral for neural injury (traumatic brain injury, spinal cord injury), neurodevelopmental disorders (autism), cognitive, motivational, and neurodegenerative disorders (multiple sclerosis, Parkinson’s disease).

By the end of Year 5, program faculty will:

- receive multiple NIH research center-related awards, positioning Rutgers among the top 10, NIH-funded U.S. research centers;
- receive more than double the current funding from federal and state grants;
- increase the number of publications (at least 10 articles per year from at least three focus areas of the institute or at least 30 articles per year in years 3–5);
- have established cross-communication and increased campuswide collaborations (to be measured quantitatively using the number of Rutgers schools, departments, faculty, and staff involved in institute initiatives over each of the five years, with qualitative assessments conducted semi-annually by institute staff to identify strengths, weaknesses, and barriers to successful collaborations);
- be recognized at the state and national levels as a critical resource to inform public policy; and
- be recognized as “best in class” regionally and within the Big Ten in neuroscience.

Emerging Signature Program

Community Health and Health Systems has been selected as an emerging signature program. While RBHS does not currently have the capacity to develop a program in this area that is likely to compete with the top programs nationally within the next five years, expertise exists within RBHS specifically and the balance of Rutgers more broadly as well, and large numbers of faculty have interests and expertise in areas of relevance. Most importantly, work in this area will address a vital RBHS/Rutgers mission and is of great consequence to the state. Further, RBHS is well situated to take advantage of funding opportunities.

Community Health and Health Systems

Health care in the U.S. is undergoing its most significant changes in half a century, and the integration and emergence of RBHS offers a singular opportunity for Rutgers to emerge as a regional and national leader guiding health system change. The federal government and major philanthropies, including the New Jersey-based Robert Wood Johnson Foundation, are investing significant resources to shift from a health care paradigm that focused solely on the patient-provider dyad to one that emphasizes a more holistic, population health perspective. National health reform is also fueling this shift by making health care systems broadly accountable for disease



prevention and improvement of the health of communities. These forces create new opportunities for Rutgers to advance as a leader in designing, implementing, and evaluating new strategies to improve health and reduce costs.

Universitywide, more than 300 faculty members identified themselves as having interests in community and urban health, health disparities, health services research, and/or quality and safety, each of which is relevant for this emerging signature program. Further, more than 100 Rutgers faculty members receive extramural funding in these areas.

Examples of Rutgers substantial capacity include:

Eric B. Chandler Health Center

The Chandler Center, one of approximately 1,300 federally qualified health centers (FQHCs) and one of 26 in New Jersey, is operated by Robert Wood Johnson Medical School in conjunction with a community board. The center, one of the few FQHCs operated by a medical school, provides primary medical and dental care to the most needy New Brunswick residents, is a training site for RBHS health professions students, and serves as a site to develop and test innovative strategies to improve the health care safety net.

The Institute for Health, Health Care Policy and Aging Research (IFH)

The institute is a national and international leader bringing together the social and behavioral sciences, clinical disciplines, basic sciences, and related fields to promote research on critical health and mental health issues. The institute has substantial extramurally funded multi-disciplinary research programs making nationally acclaimed scholarly and applied contributions. Notably, three of Rutgers' elected members of the National Academy of Sciences' Institute of Medicine are currently institute core members; in 2013, two associate members, an historian and a physician, were awarded MacArthur Fellowships. Extramural support for research and training in FY 2013 totaled \$12.5 million.

Robert Wood Johnson Medical School, Department of Family Medicine and Community Health

This nationally recognized leader in medical practice transformation has conducted intervention trials in approximately 1,000 medical practices across the country, resulting in more than 150 scientific publications. This work is being applied to the development of Robert Wood Johnson Partners, a Medicare Shared Savings Program Accountable Care Organization (ACO); and New Brunswick Health Partners, an emerging Medicaid ACO. ACOs, as defined by the Centers for Medicare and Medicaid Services, are "groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high-quality care to their Medicare patients." These and other initiatives created within RBHS laboratories of innovation and reform help reshape health care delivery in New Jersey and offer lessons for the nation.

Rutgers School of Dental Medicine, Department of Community Health

The school's Community Oriented Dental Education program offers students the opportunity to live and learn in community-based practice settings. With clinics in Newark, Northfield, Stratford, and Galloway and planned operations in New Brunswick and Camden, the dental school, which is already the largest provider of oral health care to low-income underserved populations in New Jersey, will have a statewide presence. In addition, the school's From Practice to Preceptor program, funded by the Health Resources and Services Administration, enables the dental school to address the acute shortage

of dental school faculty by educating the next generation of oral health care professionals. The proposed New Jersey Center for Oral Health Policy will provide an advocacy voice for oral health and serve as a resource for dental public health and oral health services research initiatives.

School of Nursing Community Service Programs

The School of Nursing (SON) has a strong commitment to the Newark and New Brunswick communities. The FOCUS Wellness Center, a partnership between the school and the FOCUS Social Service Agency in Newark, provides primary care and interprofessional services, including social work, pharmacy, behavioral health, and domestic violence counseling. The New Jersey Children's Health Project is a mobile van providing primary health care services to underserved and uninsured residents of Newark. The Jordan and Harris Community Health Center in Newark facilitates community empowerment and participation in health promotion programs designed to reduce health disparities. The François Xavier Bagnoud Center's mission emphasizes its commitment to improving the health of vulnerable women, children, youth, and families and to build capacity in the communities and systems that serve them. The school also leads a promotoras de salud (community health worker) training program for immigrant Hispanic women in New Brunswick. This began as an NIH-funded intervention to promote physical activity among immigrant women. The intervention was highly successful and was subsequently adopted as a standing community program sponsored by Lazos America Unida, a Mexican-American organization headquartered in New Brunswick and the Mexican Consulate of New York City. The promotoras are currently assisting SON faculty in developing and pilot testing physical activity, nutrition, and acculturation stress-reducing intervention to address obesity among Mexican immigrant women. In partnership with the consulate and the National Alliance of Mental Illness, SON faculty have also trained community men as promotores de salud to deliver research-based primary prevention programs aimed at decreasing the incidence of depression related to acculturation stress among immigrant Mexican men in New Jersey. Other programs include collaborations with community organizations to promote health, including AIDS service organizations and community social service agencies.

University Behavioral Health Care (UBHC)

UBHC provides academically based clinical programs and services throughout the state of New Jersey and is one of the largest providers of behavioral health care services in the country, including services that reach underserved populations. UBHC develops and supports New Jersey initiatives, public-sector programs, and programs for employers and the corporate community.

These entities in Community Health and Health Systems will collaborate with each other and with other Rutgers units to address important community health issues. For example, the Institute for Health, Health Care Policy and Aging Research and faculty based in arts and sciences departments can work together to address questions in two interacting translational research programs: applications of genetics and cellular biology to the clinic and community, and applications of cultural and cognitive sciences to the clinic and community.

Environmental factors play a critical role in gene expression affecting human development from in utero through adult life. Analysis of these environmental factors and differences in their frequency and content in diverse communities can lead to development of treatments targeted to environment-gene interactions both common and specific to ethnic communities and across generations in these communities.



The signature programs were selected from among the strongest of the existing RBHS programs.

Nonadherence to treatment and failure to initiate and maintain use of available, effective, and often relatively low cost treatments for asthma, diabetes, hypertension, depression, and other cardiovascular conditions are estimated to drive 70% of the costs of care for the U.S. health care system. Although nonadherence to treatment impacts all sectors of the population, its adverse effects are felt more strongly among black and Hispanic populations and the elderly. Multidisciplinary teams can address the cultural and cognitive factors underlying nonutilization of effective medication and address and improve the very mixed findings of information technology for addressing nonadherence.

Matching technology to the brain's system for processing information is poorly understood. These issues range from the selection of the sensory channel for delivery of information to procedures allowing patients to see the connection between adherence behaviors and understandable changes in biomarkers, function, and other health outcomes.



Additional productive units across RBHS include many service programs that offer substantial capacity on which to build this emerging signature area. Further, more than 40 projects funded by the NIH, Agency for Healthcare Research and Quality (AHRQ), and private foundations currently provide more than \$20 million in extramural research support for studies addressing health disparities and equity. Numerous additional projects support scholarly and applied work for community health and health systems' quality and safety.

A community health and health systems program will be initiated to develop and sustain capacity to generate high-impact, rigorous research; attract significant extramural support; effectively translate research to policy and practice; and make major contributions to improving population health, eliminating health disparities, and promoting health equity. The program's goal will be to move Rutgers toward becoming a best-in-the-nation academic institution in community health and health systems by promoting evidence-based population health improvement, engaging diverse communities, and advancing delivery system innovation.

A director for this emerging signature program will be identified in year 1. Other development activities, also to be addressed in the program's first year, will focus on identifying and building capacity within Rutgers and refining programmatic targets and metrics. Capacity building will include the development of new models of interprofessional care, new platforms for population health, including the Robert Wood Johnson Partners ACO, and sites to deliver community-oriented care, including programs that encompass both traditional care models and mobile and community-based models run by nursing school programs and the School of Health Related Professions.

Metrics and measurement strategies will be developed in three domains: the number of high-impact, peer-reviewed publications in specific fields; the extent of extramural funding, including, in addition to the NIH, support from AHRQ, CDC, other relevant federal entities, and private foundations; and efficacy of engagement with diverse communities as well as practice and policy audiences. Options will be examined and metrics will be selected during the early months of plan implementation.

Proposed Initiatives

Year 1 (first-year activities will continue through year 5, as appropriate):

- Engage Rutgers scholars in a community health and health systems working group. Key tasks include inviting participation from strategic planning groups, including health disparities and equity, quality and safety, community and urban health, underrepresented minority training, and relevant complementary areas (especially public health and clinical research); establishing communication mechanisms; and creating a steering committee and other subgroups as needed. The working group will be formed in the first month.

- Identify and implement clearly defined metrics to compare Rutgers to other institutions. Tasks include identification of appropriate metrics for: extramural funding productivity (e.g., NIH, AHRQ, CDC, HRSA, and public and private foundations); high-impact publication productivity; and effective community/delivery system/policy engagement. Metrics will be identified during months two to five and reported annually.

- Identify and investigate AAU aspirational peer institutions. Tasks could include selected site visits and identification of characteristics of highly effective institutions and to draw lessons for Rutgers. These tasks will be accomplished during months three to seven.

- Build an interprofessional learning community across Rutgers and enhance Rutgers' capacity to engage effectively in high-impact research. Tasks include creating a listserv, hosting symposia and other collaboration opportunities, identifying skill-building needs (e.g., community-based participatory research, patient-centered outcomes research, etc.), and initiating skill improvement strategies; and identifying and filling other gaps in research capacity (e.g., data sources). Creation of the learning community will begin in the third month and continue throughout the year.

- Identify and pursue funding opportunities. Tasks include: tracking and distributing funding opportunity announcements; engaging in dialogue with funding agency leaders; and developing capacity to pursue large-scale collaborative research opportunities. These tasks will begin in the second month and continue throughout the year.

- Enhance engagement with local communities and practice and policy audiences. Tasks will include: broadening collaborations with community leaders in New Brunswick, Newark,



Camden, and other communities; identifying/implementing opportunities to build skills of Rutgers faculty and staff in translation of research to practice and policy (e.g., through workshops or symposia); identifying near-term and long-term opportunities to build real community collaborations.

Years 2–5:

- Identify and implement strategies for RBHS to be a “learning health care system” by promoting a culture of collaboration and methodologic development.

- Build data and analytic capacity.

- Build partnerships with other delivery systems/networks, state governments (e.g., Medicaid agencies, departments of health), and other entities to engage in collaborative work.

- Work with other RBHS signature and complementary programs to advance excellence in community health and health systems.

- Identify, develop, and evaluate the most promising and feasible conceptual approaches for promoting population health and delivery systems innovation using the most up-to-date science.

- Support, through an internal competition, priority investments (e.g., pilot project and selected faculty hires) for two or more focused initiatives that rapidly advance Rutgers on the path to “best in class.”



- Pursue other capacity building efforts based on lessons from the assessment of aspirational peer institutions and other initial activities.
- Significantly improve programmatic metrics to be selected relative to peer academic institutions.

Complementary Programs

The RBHS strategic plan will support the development of four complementary programs to focus on areas that, while relatively strong, are not of sufficient strength currently to have the potential to be among the best in the nation within the next five years. However, they are essential for the growth and development of RBHS as well as the success of signature and emerging programs throughout RBHS. Each is critical to the RBHS mission more broadly.

Clinical Research

Rutgers' mission includes providing education and instruction, conducting cutting-edge research, and performing public service in support of the needs of New Jersey's residents.

Clinical research is necessary to improve treatments and the health status of populations. Expanding clinical research will provide access to novel treatments to the state's residents and,

in particular, disseminate the benefits of Rutgers biomedical research to the RBHS clinical enterprise and, specifically, to its health care providers, benefiting patients throughout New Jersey. It also will help advance one of the major industries in the state.

For these reasons, the expansion of clinical research was also an important motivation for the Rutgers-UMDNJ integration. While Rutgers does not have the depth and breadth of the strongest clinical research programs nationally, considerable clinical research is being conducted at Rutgers. This includes a large number of active clinical protocols (3,394), peer-reviewed grant funding (\$21.65 million in 2013; \$112.85 million since 2009), and high-impact peer-reviewed publications (73 in high-impact clinical journals (impact factor >8) and 7,062 publications cited in PubMed from 2009 through 2013). Universitywide, at least 60 faculty members currently receive NIH funding for clinical research. More than 65 faculty members who responded to a survey distributed to all Rutgers faculty in February 2014 reported that they currently receive extramural funding to support clinical research activities.

Further, considerable clinical resources are available through the large hospitals and community-based centers in Newark and New Brunswick, as well as through more than 16 integrated medical centers throughout the state. RBHS has the capacity to

provide leadership and oversight for a clinical research infrastructure sufficient to support signature programs and has the potential to expand the signature programs through foundation- and government-sponsored clinical research programs and partnership with biotechnology and pharmaceutical companies, and building clinical research bridges that would allow Rutgers to become a significant national leader.

Proposed Initiatives

Years 1–5:

- Develop the infrastructure needed to support an NIH application for a Clinical and Translational Science Award (CTSA). When awarded, the CTSA would be a resource accessible to and supportive of research programs within all RBHS schools and units, and all schools and units Rutgers-wide with health-related research programs. The CTSA would provide expanded core resources in key areas, including biostatistics, bioinformatics, data management, clinical trials and epidemiology, research nursing, and pharmacy and pharmacology.

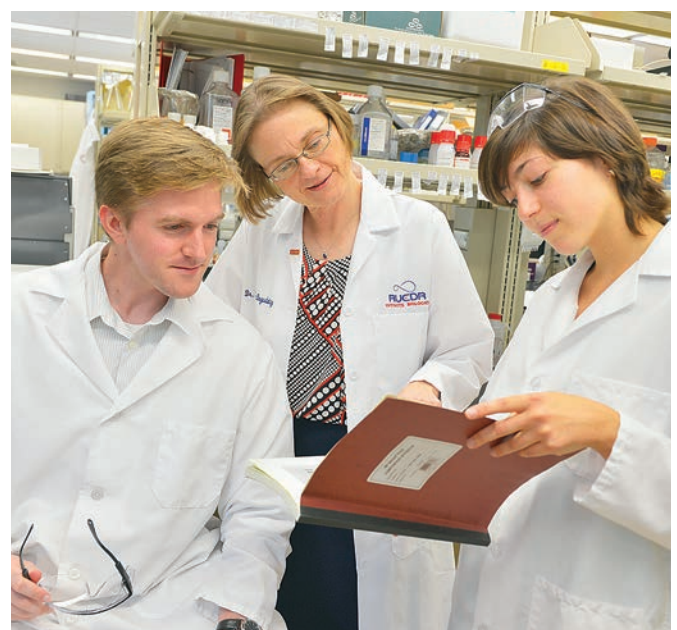
- Collaborate with the Rutgers University Cell and DNA Repository (RUCDR) Infinite Biologics, the world's largest university-based biorepository. In operation since 1999, RUCDR has perfected the science of biobanking, bioprocessing, gene sequencing, and analytics. RUCDR currently works with several centers and institutes at Rutgers. The collaboration would enable RUCDR to support RBHS researchers focusing on the genetic causes of common, complex human diseases and enable genomic discoveries that would lead to diagnoses, treatments, and cures for these diseases. The collaboration will also enable us to advance our ability to determine individual/genetic susceptibility to the benefits or risks of therapies. Through this collaboration, resources would be available to assist investigators and provide access to high-quality biomaterials, technical consultation, and logistical support.

Discussion is under way to address the clinical research infrastructure across Rutgers. An initial step would include the creation of a biostatistics consulting service that would merge existing services and coordinate activities universitywide and, in particular, clinical research in the School of Public Health, at Rutgers–New Brunswick and at Rutgers–Newark.

The following tasks will be conducted in **Year 1**:

- identifying a leader for this program who, with other senior clinical researchers, will visit academic sites with similar centers in development;
- establishing a CTSA Advisory Committee;
- recruiting a CTSA director;
- beginning recruitment for nursing, pharmacy, and other relevant staff from internal and external sources;
- identifying clinical research unit space for CTSA development at both Rutgers–New Brunswick and Rutgers–Newark;
- developing a financial model for CTSA support; and
- initiating work with the cancer signature program to recruit new clinical investigators.

Additional critical tasks in year 1 will include efforts to improve and increase clinical research activity and infrastructure to streamline clinical trial negotiations with pharmaceutical companies and enforcing competitive timelines attractive to the pharmaceutical industry in an effort to increase activity and preliminary data necessary for a CTSA application.



The following tasks will begin or be conducted in **Year 2:**

- providing CTSA services across Rutgers;
- recruiting core staff and developing organizational structure (continued);
- establishing standard operating procedures;
- integrating IRB services across the network;
- developing informatics for integrated databases;
- establishing new cores in biostatistics, bioinformatics, and pharmacy as dictated by the Advisory Committee and CTSA director;
- identifying current faculty for integration into the center;
- developing a plan for integration with RUCDR and biorepository; and
- working with the neuroscience signature program to recruit new clinical investigators.

In Year 3:

- Preliminary application for a CTSA award will be developed.
- Strategic recruitment of new faculty in specialized centers to enhance faculty critical mass in clinical investigations will be conducted.



- Three to five collaborative research grants (e.g., PO1, SP0RE, etc.) will be submitted.

- Concurrently, new clinical investigators will be recruited jointly with the infection and inflammation signature program.

- A pilot grant program in clinical investigation will be developed.

In Year 4:

- The CTSA application will be submitted.

- The recruitment of new clinical investigators will be conducted jointly with the environmental and occupational health sciences program.

- A major industry partnership will be established.

In Year 5:

- The CTSA award will be established.

- Rutgers will be identified as a national leader in clinical research in each of the signature programs.

- Development of clinical programs in other health-related disciplines universitywide will begin.

Drug Development

Rutgers is uniquely positioned in the areas of drug discovery and development to provide complementary support for RBHS signature programs—an important motivation for the Rutgers-UMDNJ integration. Rutgers is the only Big Ten university geographically located in the midst of a large biopharmaceutical cluster. Additionally, the integration establishes Rutgers as a powerhouse of biomedical health science research in the New Jersey biopharma ecosystem. The new Rutgers and the health care-focused biotechnology, diagnostic, and pharmaceutical industries have complementary strengths, especially at the intersection of discoveries that can be translated into new medicines. This is an initiative in which RBHS will play a major role.

All drug discovery and development companies, regardless of therapeutic focus, use platform technologies to bridge the gap between clinical need and translational innovation. Rutgers' core competencies in these technologies include: structural biology; biologics, proteins, and polypeptides; drug delivery;

computational biology and structure-based drug discovery; molecular synthesis; and translational science. Rutgers is also establishing emerging competencies in disease-focused translational and discovery research in oncology and infectious and neurological diseases. Rutgers also recognizes an opportunity to build a complementary and supporting capability in pharmacopidemiology. Further, Rutgers has considerable strengths in a vast scope of discovery biology that have not been designated as core competencies, including metabolomics, fibrosis, inflammatory disease, and neurotrauma.

Faculty members with interest and expertise in drug discovery and development are well funded, and many have developed strong relationships with members of the biopharmaceutical industry. From 2011 through 2013, Rutgers faculty funding in these areas, including federal and state government, corporations, foundations, institutions of higher education, and associations and other sponsors, totaled more than \$204 million. Nearly 100 Rutgers faculty members currently receive NIH funding for research in drug development and drug discovery. Publications in these areas from 2011 through 2013 totaled approximately 2,000.

A universitywide Drug Design Center will be formed to develop and enhance discovery of lead compounds to advance medicine. The center will spur development programs through close collaboration with translational efforts in cancer, environmental and occupational health, infection and inflammation, and neuroscience, as well as in collaboration with the clinical research complementary program. In year 1, a leader for this program will be designated to be responsible for identifying Rutgers faculty members with valuable expertise in the broad field of drug discovery and development.

Proposed Initiatives for the Drug Design Center

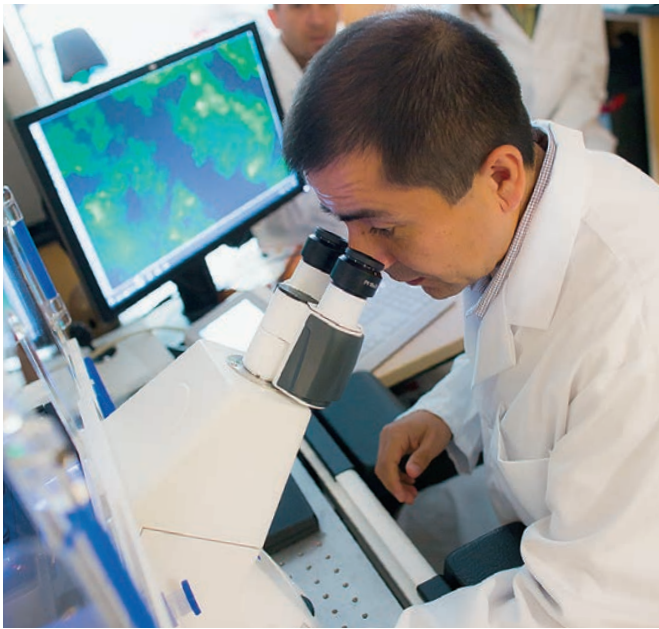
Years 1–5:

■ Formally designate drug discovery and development core competencies in the following platform technologies: computational biology and structure-based drug design; structural biology; biologics, proteins, and polypeptides; drug delivery; molecular design and synthesis; and translational science. Moving forward, an annual review will be conducted to identify additional competencies and reevaluate established competencies.



■ Promote joint recruitment of world-class faculty across academic units. All hiring needs and opportunities within RBHS will be evaluated for potential synergies with other units and departments, including non-RBHS units (e.g., the School of Arts and Sciences, its Department of Chemistry and Chemical Biology, and the new Rutgers University–New Brunswick Institute for Quantitative Biomedicine). Coordinated recruitment efforts will begin immediately. The details of joint hires will be addressed by unit leadership on a case-by-case basis. Coordinated hires will include the leadership of the Drug Design Center, faculty or staff to bring relevant core competencies, and faculty relevant to RBHS signature programs.

■ Enable multi-PI, collaborative grant opportunities as well as establish training and educational initiatives that align with core competencies in platform technologies and translational research in signature programs. RBHS and the Drug Design Center will solicit, promote, and cultivate major multi-PI programs in research and training. Planning for collaborative grant opportunities will begin immediately; at least one major multi-PI grant application, training program, or educational initiative will be advanced by each core competency each year beginning no later than 2015.



- Provide essential service capabilities where collaborative teams are not available. This capability, currently growing within the Office of Research and Economic Development, will be coordinated with RBHS strengths in drug discovery and the Drug Design Center and will be reviewed annually.

- Institute interdisciplinary seminars and working groups focused on drug discovery and development, to be organized by core competencies, the Drug Design Center, and RBHS signature program leadership. Creation and development will begin in 2014 and be completed in 2015. Activities will be reviewed annually.

- Maximize the value of innovation by creating new tools and lead compounds relevant to drug discovery and development through collaborative research. Specific activities will include fostering collaborations with the biopharma industry and investigating small business innovation research/small business technology transfer funding opportunities, to be managed by the Drug Design Center, RBHS, and Rutgers leadership. It is anticipated that the newly constituted Rutgers University Neuro-Engineering Group (Rutgers–New Brunswick), launched to create enhanced opportunities with industry, including the transfer and commercialization of pharmaceutical products, will be particularly valuable in this regard. Reviews will be conducted quarterly.

Informatics

Computational and big data-enabled research is a vital theme cutting across the national research and education agenda in all areas of biological, health, and life sciences, and it is critically important that RBHS specifically and Rutgers more broadly build core competency in this area. Considerable interest in this area exists across the university. More than 60 faculty members currently receive NIH funding for research in informatics or related areas. Additional faculty members receive extramural funding from other sources to support their work.

To be internationally competitive and to ensure the success of RBHS signature and emerging programs, it is critical that Rutgers develop and implement a bold strategic vision for an advanced cyberinfrastructure (ACI) ecosystem. This vision must address the needs of RBHS and provide researchers with essential computing and data handling capabilities and expertise, and students with necessary exposure and training. Given the large and growing volumes and variety of data associated with each of the designated signature and emerging areas (cancer, environmental and occupational health, infection and inflammation, neuroscience, and community health and health systems), as well as the growing number of modalities that are actively gathered as part of these investigations, access to adequate computational and data analytics resources as well as related cross-disciplinary expertise presents a dominating challenge. To continue to propel these programs forward, Rutgers must establish the requisite cyberinfrastructure, with necessary computing, storage, and networking resources and associated expertise that will allow reliable and timely processing of data and its transformation into knowledge to accelerate advances in research, educational, and clinical practices in each of the signature programs.

A strategic investment—comparable to those being made by peer institutions—is needed to drive innovation, improve research capabilities and productivity, enhance faculty competitiveness, and address limitations in existing capabilities and critical gaps. Identified gaps within RBHS and across Rutgers span four key dimensions:

- Administrative structures for multidisciplinary research
- Personnel and expertise in computation and data
- ACI

- Student education and training in the use and assembly of big data

Addressing ACI ecosystem needs is an important element for Rutgers' strategic plan; RBHS plans must align accordingly. Specific recommendations include:

- establishing a Rutgers-wide office for research cyber-infrastructure;
- creating a balanced ACI at Rutgers;
- recruiting faculty with systems and computational expertise and biomedical informatics expertise; and
- establishing multidisciplinary research and educational structures.

Proposed Initiatives

Years 1–5:

- Select a leader for the RBHS program in collaboration with Rutgers-wide ACI strategic planning. Additional efforts will include a focus on understanding ACI (computer, data, communication, expertise, education/training) requirements and priorities from stakeholders across Rutgers. This will be accomplished, in part, with the organization of a one-time workshop for all investigators either utilizing or planning to utilize big data in their research. The intent would be to share information, including successes and failures, establish lines of communication across Rutgers, and create opportunities for collaboration and the development of grant proposals supporting RBHS signature programs. Finally, existing best practices should also be investigated and important features adopted for use at Rutgers. These efforts should align with the ongoing ACI strategic planning efforts and will be completed in the first six months.
- Establish key structures for research and education that can support multidisciplinary computational and data-enabled science, as well as deploy the ACI core to support immediate research/education needs. An overarching universitywide management structure in the form of the Office of Research Cyberinfrastructure should be established. These activities will be completed within the first three years.
- Develop mechanisms for ensuring sustained investments in ACI and its seamless integration into all aspects of research and education within RBHS and across Rutgers. Mechanisms for oversight and adaptation/correction should also be established. These mechanisms will be established in years 3–5.

Complementary programs focus on areas that are not currently of sufficient strength to become among the best in the nation within the next five years, but are essential for RBHS development and the success of signature programs, and are critical to Rutgers' mission.

The overarching metric of ACI success will be its ability to effectively support the research and education mission within RBHS and across Rutgers. Specifically the metric should address the following questions:

- Does the ACI provide the appropriate capabilities for enabling transformative research and innovation?
- How effectively does it support education and training?
- How effectively and easily can users (researchers, educators, students, practitioners, etc.) use the ACI as a research and training platform?



■ How does ACI allow research to be competitive with peers?

The metric will leverage more standard analytical tools such as user and usage measures, publications and citations, and grant funding.

Public Health (Including Global Health)

Public health, an important motivation for the Rutgers-UMDNJ integration, is a key component of RBHS's health care mission and a priority for the state. It also is an integral component of one of the Rutgers strategic plan themes: improving the health and wellness of individuals and populations. RBHS faculty and staff are well positioned to support public health through initiatives led by RBHS and other Rutgers schools. It also builds on recent relationships established with the New Jersey Department of Health, reflected by the health commissioner's inclusion on the search committee for a new School of Public Health dean. This is an opportunity to support RBHS signature programs, specifically through methodological consultation for basic, clinical, and outcomes research, including the training of methodologists to assist in consultation. Universitywide, at least 175 faculty members with appointments in schools throughout RBHS and elsewhere at Rutgers currently receive NIH funding for research in public health, population health, health promotion, wellness, health behavior, preventive medicine, global health, or a related field.



Primary contributors to this complementary program will include, among others, faculty from the School of Public Health (SPH) in Piscataway, the Department of Preventive Medicine at New Jersey Medical School (NJMS), the Department of Quantitative Methods: Epidemiology and Biostatistics at SPH in Newark, the François Xavier Bagnoud Center in the School of Nursing, and the Environmental and Occupational Health Sciences Institute. Many of these faculty members have ongoing collaborative relationships with faculty who will contribute to each of the RBHS signature programs. The new SPH dean will direct this complementary program.

While public health research, service, and training involve a diverse range of topics, all rely on methodological expertise, including biostatistics, epidemiology, survey research, and health economics. With these tools, public health professionals can efficiently develop competitive applications for grant funding from foundations, state government, the NIH, and other federal granting agencies. Data from well-designed and well-analyzed large-scale studies will allow multidisciplinary faculty to respond swiftly to emerging needs within the surrounding community, the state, the nation, and around the globe. The complementary public health program at Rutgers will bring this expertise to signature areas across RBHS and will extend work beyond RBHS and elsewhere at Rutgers by training new public health professionals.

The work of each of the RBHS signature programs will be enhanced with support from the public health complementary program. For example, ongoing tobacco control research, an important component of the cancer program and performed by many public health faculty, has generated nearly \$8 million in direct funding and yielded nearly 60 publications in the last five years. The informal injury prevention and control group at RBHS in Newark, whose work includes traumatic brain injury, brings together researchers, educators, and service providers across Rutgers, all of whom will support the neuroscience program. Further, experienced infectious disease epidemiologists will enhance the infection and inflammation program. Finally, environmental health is a core area of public health research and education.

A Biostatistics and Epidemiology Consultation Center (BECC), housed within SPH, will be created to support RBHS signature programs, the emerging signature program, and other RBHS research, as well as biomedically oriented studies



throughout Rutgers. An aggressive plan for this center will be needed, however, as significant gaps exist in RBHS public health programs.

Proposed Initiatives

Year 1:

- A School of Public Health dean with a broad public health background will be recruited and will promote interprofessional practice and advocate for resources to support RBHS signature areas in addition to areas identified in the RBHS and SPH strategic plans.
- A senior methodologist with administrative experience and a significant grant history will be recruited as director of the BECC.
- Baseline metrics will be verified/established.
- Infrastructure and staffing needs for the BECC will be identified, and a BECC director/manager will be appointed.
- Support staff for the BECC will be recruited, especially data analysts.
- A series of conferences will be held for key stakeholders under each of the signature areas to strengthen the BECC's ability to mobilize a multi-school response to requests for proposals.

Year 2, during which time SPH will be reorganized under the leadership of the new dean:

- Pilot funding mechanisms for public health research in the signature areas will be developed.
- Pilot funding will be awarded to public health researchers in the signature areas.
- Master's, pre- and postdoctoral public health fieldwork and research fellowships in the signature areas will be developed.
- Methodologists will be recruited in collaboration with the signature programs to support research and policy in each of the signature areas.
- Public health researchers will be recruited, particularly across the signature areas, potentially including tobacco control (with expertise in chemistry or toxicology), injury prevention, and infectious disease epidemiology.

Years 3–5:

- Public health faculty will collaborate with others at Rutgers and submit grant applications in each of the signature areas.
- Public health faculty will submit a grant application to CDC to create a Rutgers Injury Control Research Center.



- A faculty mentorship program will be developed to recognize and support rising junior faculty in the signature areas and the emerging signature area and promote their development.

During this five-year period:

- The overall number of public health-oriented extramural grant submissions from schools throughout RBHS in the signature areas will increase by 50%.
- NIH extramural funding will increase by 33% by year 2 and double by year 5.
- The number of research publications in public health topics across RBHS will increase by 10% annually.
- The number of faculty supported by public health-oriented extramural funding in signature areas will triple by year 5.
- Collaborative projects of SPH methodologists with researchers in signature areas will double in number, from five currently to 10 by the end of year 5.
- SPH faculty will participate or lead in submitting and obtaining peer-reviewed extramural federal funding for center, program, project, and core grants in collaboration with faculty associated with each RBHS signature area, which will double by year 5.

- RBHS will establish a national reputation in public health in the signature areas and potentially in injury prevention by year 5.

- RBHS will become “best in class” in tobacco control research by year 5.

- SPH will rank in the top 20 schools of public health by the *U.S. News & World Report* by year 5.

Global health will also be a key component of this complementary program, as it is an equally important priority for RBHS’s health care mission and three of Rutgers’ strategic planning integrating themes: cultures, diversity, and inequality—local and global; improving the health and wellness of individuals and populations; and educating involved citizens and effective leaders for a dynamic world.

Primary contributors will include faculty in the RWJMS Office of Global Health, the NJMS Institute for Infectious and Inflammatory Diseases, Rutgers School of Dental Medicine, the SPH Center for Global Public Health, the SON François Bagnoud Center, the Environmental and Occupational Health Sciences Institute, and the Centers for Global Advancement and International Affairs. It is anticipated that faculty from other schools within RBHS and across the university will also contribute. An example of how the signature programs will be enhanced by global health programs is provided by the existing linkages between global public health and environmental and occupational health faculty in studies related to air pollution, climate change, and pesticide health. In addition, an expansion of research into global environmental and occupational health issues, such as worker health and safety, is anticipated, further enhancing work in this area.

The global health component of this complementary program will be managed by the chancellor’s office. An important objective will be to include all RBHS schools.

Proposed Initiatives

Year 1:

- Recruit a Henry Rutgers Term Chair for Global Health, who will assume responsibilities for leading global health activities for this complementary program. He or she will receive a faculty appointment in the appropriate RBHS school.

Year 2:

- Develop plans for a global public health master's degree program (potentially a joint-degree program will emerge across schools).
- Recruit public health research faculty with interests in global infectious diseases and global environmental and occupational health.
- Create a web-based resource center to centralize global work as a virtual clearinghouse, publicize and capitalize on the humanitarian global health work at Rutgers, and encourage student participation in global work.
- Develop a database of global health-related grants and publications universitywide.

Years 3–5:

- Finalize plans for a global health master's degree program.
- Expand RBHS's global health capacity in the signature areas through meetings, communication, and the web-based resource center.

During this five-year period, the number of student global internships or volunteer placements will increase by 30%, and RBHS will establish a national reputation in global health.

Educational Initiatives

Seven educational initiatives have been selected for development during the five-year strategic plan: novel approaches to teaching and interprofessional education, led centrally by RBHS; undergraduate health-related education, underrepresented minority group pipeline programs, and leadership training, pursued by RBHS, with Rutgers taking the lead; and joint-degree and professional educational program efforts, led primarily by specific RBHS schools.

Novel Approaches to Teaching

The Novel Approaches to Teaching initiative at RBHS will create learning environments that promote quality and patient safety while continuing to advance educational excellence for future health care providers of the state of New Jersey and the nation as a whole. RBHS schools have current strengths in this area (e.g., the long-distance learning program in the School of

Health Related Professions, community-based service-learning in the Rutgers School of Dental Medicine, and the simulation laboratories in the School of Nursing). In order to achieve this goal, specific objectives will be met as noted below and a Novel Approaches to Teaching Steering Committee will be created and led by the RBHS vice chancellor for interprofessional programs. The steering committee will oversee the development and implementation of novel approaches to teaching. Specific focus will be placed on six potential educational programs/areas of interest: excellence in distance learning, massive open online courses (MOOCs), mapping and sharing of foundational curricular resources, simulation education, strategies for shortening the training path, and utilization of learning management systems. Strategies to enhance and expand existing programs throughout RBHS will be developed. Activities will include cataloging existing programs and reviewing methods utilized by existing programs within RBHS and across Rutgers and by successful and innovative programs offered by peer and aspirant institutions. These programs/approaches will be linked, as appropriate, to ongoing Rutgers programs with similar foci. Subcommittees focused on these approaches will be formed, many in concert with the Interprofessional Education Faculty Advisory Council.

The foundational element of all innovative educational programs will be the RBHS commitment to train highly



competent health care professionals who provide high quality, safe patient care and other services, or who engage in high quality research. All RBHS educational programming will be patient-focused at the individual, family, community, societal, or global level. The modalities noted above will be utilized to improve the quality, efficiency, and visibility of RBHS educational initiatives.

Technology is a key component of the efforts to improve educational offerings. In addition to simulation labs and MOOCs, RBHS students will be highly proficient in incorporating “bedside” technologies available on smartphones, tablets, and laptop computers. These technologies can enhance patient safety by reducing errors and making evidence-based or consensus, panel-developed prevention or disease management protocols easily accessible to all clinicians.

Six specific objectives are planned.

The first objective is to expand the usage of existing simulation facilities by extending access to all learners on the same campus where appropriate. To accomplish this objective all schools will become familiar with RBHS simulation facilities, technological resources, and programs on all three campuses during academic year 2015; all schools will identify current and anticipated simulation needs and timing of these needs by June 30, 2015;



schools will begin to share simulation resources on an ad hoc basis during academic year 2015; a master schedule for the use of all simulation centers and programs will be developed by the end of academic year 2016; each school will develop one mandatory interprofessional simulation experience for all students by the end of academic year 2016; and RBHS faculty will submit at least five papers on interprofessional simulation by academic year 2017.

The second objective is to develop an administrative structure to oversee the utilization, planning, designing, and maintenance of current and future simulation resources. In order to do so, a feasibility study will be conducted in collaboration with the RBHS deans and chancellor to determine the resources available to create a centralized simulation center on each campus, to be completed by the end of academic year 2017. The Novel Approaches to Teaching Steering Committee will collaborate with the educational administrative leadership at all RBHS schools to develop a recommendation for the most appropriate administrative oversight structure for simulation experiences throughout RBHS by the end of academic year 2017. If deemed appropriate, comprehensive, interprofessional simulation centers will be developed at RBHS in New Brunswick/Piscataway and Newark, with financial support to be identified and architectural designs to be completed by the end of academic year 2019, with the centers to be completed by the end of academic year 2020.

The third objective is to adopt a single, unified learning management platform. Tasks include: a survey of all learning management systems (LMS) currently in use within RBHS, to be completed by the end of academic year 2015; a survey of learning management systems in use at RBHS peers and aspirational peers, to be completed by the end of academic year 2015; a survey of faculty who are high utilizers of LMS to determine their interest in change and their preference for a single LMS, to be completed by the end of academic year 2016; a single LMS for RBHS will be fully implemented and fully functional by the end of academic year 2019; achieving IT capacity needed to implement a fully functional LMS will be determined during academic year 2016; identifying and acquiring analytic tools needed to enhance the functionality of the LMS, implemented during academic year 2017, and achieving IT upgrades to accommodate a fully functional LMS will be implemented by academic year 2019.

The fourth objective is to map, develop, and share RBHS foundational curricular resources. To accomplish this: a library of content-rich, standards-based curricular materials for common concepts that are foundational to health sciences education will be completed by the end of academic year 2018; and a library of instructional materials that promote the development of critical thinking skills for all learners will be housed in the LMS library by academic year 2019.

The fifth objective is to enhance and expand the utilization of distance learning for undergraduate, graduate, and continuing education. To accomplish this objective: all RBHS faculty involved in classroom or online teaching will be offered faculty development to improve online teaching skills, similar to what is now being provided to SHRP faculty, with the first course to be developed and offered RBHS-wide in academic year 2016; the executive director of the RBHS Center for Continuing and Outreach Education will collaborate with the Rutgers Center for Online and Hybrid Instruction to enhance online continuing education offerings from RBHS, with collaboration to begin in academic year 2015; and the utilization of RBHS online continuing education courses will increase by 50% by the end of academic year 2019.

The final objective is to determine the feasibility of shortening the training path for some RBHS programs. This will be accomplished by: exploring existing program shortening currently under way at RBHS, to be completed by the end of academic year 2016; exploring the feasibility of shortening other educational programs by the end of academic year 2019; attaining institutional membership to the National Center for Faculty Development and Diversity (NCFDD), to be achieved by RBHS by academic year 2016; examining the “research to writing gap” for faculty in RBHS schools, by the end of academic year 2016, and shortening significantly the average “gap” by the end of academic year 2019; and RBHS, the Rutgers Office of Instructional and Research Technology, and the greater Rutgers community collaborating to combine NVivo expertise and share server space by academic year 2016.



Interprofessional Education

The definition and goal of Interprofessional Education (IPE)—an important educational program for all RBHS students—are those identified by the World Health Organization, adopted by the Interprofessional Education Collaborative, and commonly used by the health professions: “[IPE] occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes. Once students understand how to work interprofessionally, they are ready to enter the workplace as a member of the collaborative practice team.”

IPE programs will include RBHS students as well as other Rutgers students pursuing health or health-related professions, as appropriate, such as students enrolled in the School of Social Work and the doctoral school psychology program at the Graduate School of Applied and Professional Psychology. Together, students in different disciplines would receive joint training in health care settings to learn concepts of coordinated care.

Highly functioning interprofessional teams have demonstrated improved health outcomes, increased quality, and improved access to care. IPE is therefore critically important as RBHS strives to train future generations of health care professionals and researchers for the state of New Jersey and beyond. Successful implementation of IPE at RBHS requires



the development of an administrative structure and the allocation of resources centrally as well as from each school.

The RBHS Interprofessional Faculty Advisory Council (IPEFAC) was created during academic year 2014 to oversee the development and implementation of IPE within RBHS. The council is chaired by the RBHS vice chancellor for interprofessional programs, with each RBHS school represented. The council also includes a faculty member of the School of Social Work in light of the significant contributions of social workers to the health care team. In addition to IPEFAC, a number of IPE-focused subcommittees have been or are being formed. These include the research and scholarly activity subcommittee, the IPE faculty development subcommittee, the large and small group teaching subcommittee, and the IPE simulation subcommittee. It is anticipated that subcommittees will include representatives of the Novel Approaches to Teaching Steering Committee as well.

The vice chancellor, in collaboration with the IPEFAC, has already begun mapping a plan to enable RBHS to become regarded as among the nation's leaders in interprofessional education and collaborative practice. One measure of RBHS's success as a national leader will be its designation by the National Center for Interprofessional Practice and Education as a Nexus Innovation Incubator member. To that end, faculty members

from several RBHS schools have attended the national Interprofessional Education Consortium conferences as well as other IPE-focused conferences to learn about IPE innovations in the U.S., Canada, and European countries.

Rutgers already conducts a nationally recognized care program in the FOCUS Wellness Center, housed within the School of Nursing, bringing interprofessional hands-on clinical experience to patients in Newark. FOCUS stands as a learning lab for students from a variety of professions in providing an innovative model of care. Other programs are in their infancy, such as an IPE program led by the School of Health Related Professions' (SHRP) physician assistant program, which includes 350 students and 50 faculty representing SHRP, the Ernest Mario School of Pharmacy (EMSOP), the School of Nursing, and the School of Social Work. An interprofessional simulation laboratory is currently being planned by EMSOP.

Four specific objectives are planned.

The first objective is to create an RBHS-wide administrative infrastructure to support the development of IPE initiatives. Some of this infrastructure exists in the roles of the vice chancellor for interprofessional programs, who oversees development and implementation of IPE, and the IPEFAC. Plans to be

implemented include: hiring a program coordinator in academic year 2015 to help support the implementation of required IPE activities and assist in the preparation of grant proposals; forming a Rutgers Interprofessional Student Council (RISC) in academic year 2015, to convene quarterly and include representatives from the eight RBHS schools as well as the School of Social Work; forming an RBHS IPE Academic Administrators Group by the end of academic year 2015; and striving to adopt IPE specific goals and objectives in the strategic and facilities plans of each RBHS school.

The second objective is to facilitate the development of a wide range of student IPE learning opportunities. Activities include: developing an IPE research and scholarly activity subcommittee of the IPEFAC to facilitate educational research and publication by RBHS faculty (the co-chairs for this subcommittee were identified in the fourth quarter of academic year 2014 and the full complement of subcommittee members will be established during academic year 2015); creating an IPE faculty development subcommittee to propose and spearhead educational opportunities for IPE teachers, small- and large-group facilitators, and clinical preceptors, and chaired by and consisting of RBHS Master Educators' Guild members (the chairs of the subcommittee were identified in the fourth quarter of academic year 2014, with remaining members to be identified by the end of the first quarter of academic year 2015); developing an IPE simulation subcommittee in collaboration with the Novel Approaches to Teaching Steering Committee, which will be formed by the end of the second quarter of academic year 2015; developing an IPE small- and large-group teaching subcommittee by the end of the first quarter of academic year 2015; presenting IPE-focused grand rounds/conferences quarterly, to begin in academic year 2014; developing, in collaboration with members of the Novel Approaches to Teaching Steering Committee, an online foundational IPE course available to all RBHS students, beginning the first quarter of academic year 2016; developing, in collaboration with the Novel Approaches to Teaching Steering Committee, a catalog of all small- and large-group IPE courses, and making it available to all RBHS faculty (the first phase will be completed in academic year 2015; the catalog will be ongoing); and identifying opportunities for IPE collaborations with Rutgers–New Brunswick and Rutgers–Newark, beginning in academic year 2015.

Educational initiatives were selected for their potential to improve and/or enrich educational and training programs throughout RBHS.

Other initiatives include applying for private and public external funding to support IPE activities, which will be executed annually (several RBHS schools already receive some grant funding for IPE activities); assessing the current status of interprofessional collaborative practice, to be completed by the end of the second quarter of academic year 2015; working with RBHS faculty practices to enhance their functioning as highly effective interprofessional collaborative practices as appropriate, in order to maximize learning during student exposure to interprofessional collaborative teams during their clinical rotations, beginning in the third quarter of academic year 2015; developing and implementing team, objective-structured clinical examinations (TOSCE), beginning in academic year 2016 (the first TOSCE will be administered in the first quarter of academic



year 2017); and formally evaluating all IPE activities in order to make improvements as needed (this process began in academic year 2014 and will continue moving forward).

The third objective is to enhance the physical infrastructure available to students for IPE experiences. Planning activities include the possible development of an IPE building at RBHS in Newark. Preliminary planning began in academic year 2014, including the completion of preliminary architectural plans. Planning will be completed by the first quarter of academic year 2016. Whether ample resources exist to proceed with the building, if it is considered desirable, remains to be determined.

A feasibility study will be conducted on each campus to determine the need and resources available for creating a centralized simulation center. This study will be completed by the end of academic year 2017 in collaboration with the deans and chancellor. The Novel Approaches to Teaching Steering Committee, working with the IPEFAC, will collaborate with the educational administrative leadership at all RBHS schools to develop recommendations for the most appropriate administrative oversight structure for simulation experiences at RBHS by the end of academic year 2017. Finally, if determined to be appropriate, new comprehensive, interprofessional simulation centers may be developed at RBHS in New Brunswick/Piscataway and Newark. Funding will be identified and architectural designs



completed by the end of academic year 2019. The centers will be completed by the end of academic year 2020.

The fourth objective is to enhance the national reputation of RBHS as a leader in interprofessional education. This will be accomplished by: faculty submission of at least five papers on interprofessional simulation by academic year 2017 and subsequently five papers annually; faculty presentation, at a minimum, at one national conference on IPE annually beginning in academic year 2015; and RBHS sponsorship of a regional conference on IPE beginning in academic year 2016.

Undergraduate Health-Related Education

Rutgers can receive national recognition through its high-priority, undergraduate health-related educational programs. RBHS encourages innovative, new program development and expanding existing programs, particularly those with articulation ladder opportunities for undergraduate students with interests in health professions education. Leadership for these will be provided by the respective undergraduate school and program, with support and assistance provided by RBHS as appropriate. Further, RBHS proposes to work with the undergraduate Rutgers programs to integrate interprofessional educational programs and novel approaches to teaching programs, such as simulation education. RBHS will maintain internet-based lists of undergraduate health-related educational programs and provide links to more information about these programs, and RBHS schools will assist program leaders in promotional activities as appropriate. The timeline and metrics will be developed in collaboration with the university.

Underrepresented Minority Group Pipeline Programs

Underrepresented minority group pipeline programs are a high priority for RBHS and elsewhere at Rutgers, as these programs highlight two of Rutgers' greatest strengths: its diverse student body and the range of its educational offerings in the health sciences and related fields. RBHS is in an advantageous position to recruit and train promising students who are members of populations underrepresented in the health sciences and is poised to do so.

Multiple ongoing and successful pipeline programs are managed by schools and institutes within RBHS, including the Educational Opportunity Fund (EOF), which provides opportunities for students from economically disadvantaged backgrounds in

New Jersey to participate in higher education programs. EOF provides financial, academic, and counseling support services to qualified students who demonstrate potential and need. The School of Nursing's EOF program is the only one in the state tailored for nursing students, and the School of Health Related Professions' EOF program is the only one designed for allied health professions students. Graduates of these programs have assumed leadership roles as health professionals.

Additional programs include the Rutgers Summer Medical and Dental Education Program, born 52 years ago, which teaches college sophomores and juniors leaning toward those professions about the medical and dental school experiences, and Project L/EARN, which is a social science health research internship program that trains and advises undergraduates with interests in careers in health services and research. Founded in 1991, Project L/EARN, housed in the Institute for Health, Health Care Policy and Aging Research, received an "Innovative Program Model" award from the National Association of Minority Medical Educators.

Underrepresented minority group pipeline programs are also a high priority universitywide, so efforts will be undertaken to coordinate/bridge RBHS programs with other Rutgers programs, as well as with the emerging community health and health systems signature program. These efforts will be managed through the chancellor's office to ensure coordination and collaboration. RBHS activities, in particular, will include an emphasis on scholarly activity and identifying funding opportunities.

Critical gaps in underrepresented minority group opportunities within RBHS include:

- a lack of information regarding the structure, function, and impact of existing pipeline programs;
- a lack of a tracking system for all pipeline program participants/graduates;
- the absence of a robust mentoring and alumni pool and standard measures of success; and
- the identities of additional funding sources to grow and replicate programs and entice qualified participants from underrepresented groups to RBHS pipeline programs.

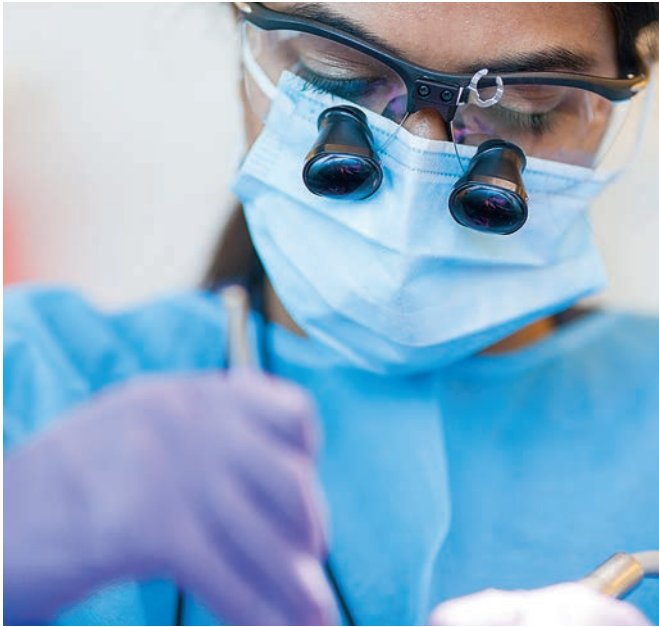
Highly accessible opportunities include:



- existing rich educational offerings for humanistic, linguistic, and cultural competency training that can support further interprofessional collaborations among RBHS units; and
- multiple campuses, which can produce local replications of programs developed by other Rutgers units.

In collaboration with Rutgers–New Brunswick, Rutgers–Newark, and Rutgers–Camden, RBHS aims to:

- increase the visibility of productive high-caliber underrepresented minority group programs available throughout Rutgers;
- focus on holistic admissions processes (i.e., a balanced, individualistic review and assessment of qualities presented by an applicant taking into account cognitive and noncognitive factors);
- retention of minority students and faculty; increase diversity and inclusion in the allied health, research, and policy professions;
- provide humanistic, culturally and linguistically sensitive educational experiences through RBHS pipeline programs;
- continue to develop and enhance mentoring, role modeling, and leadership opportunities; and
- promote collaboration across all campuses in education and research training.



The timeline and metrics will be developed in collaboration with the university.

Leadership Training

Leadership training is a vital priority for RBHS and Rutgers as a whole. RBHS will work with the Rutgers executive vice president for academic affairs, who oversees leadership training programs for all university faculty and works with University Human Resources for staff leadership training. An RBHS task force will develop a compendium of existing leadership training programs, including descriptions, for comparison with leadership training programs offered elsewhere at Rutgers and through the CIC. The task force will work with central administration, the planned Rutgers–New Brunswick-based Rutgers Leadership Academy, and campus leaders to take advantage of the many existing programs and develop leadership training programs for faculty and/or staff, as needed, to fill gaps. It is anticipated that some newly developed leadership training programs will be discipline-specific while others will address concepts and issues that cut across academic disciplines. All will be coordinated with the broader Rutgers community and linked to CIC institutions as appropriate. The timeline and metrics will be developed in collaboration with the university.

Joint-Degree Programs

Joint-degree programs are important, as they enhance training opportunities for health professional students and recruitment of the best students, particularly now as health care moves toward new models of team care and delivery systems. RBHS must prepare its biomedical and health sciences graduates to operate seamlessly across disciplines. Management of these programs at all levels, including decisions regarding their status and the creation of programs moving forward, will continue to be led by those respective schools, as they are best equipped to do so. RBHS will assist schools by developing a compendium of joint health-related degree programs nationally, analyzing those programs by focusing on utility and success, and working with RBHS marketing/communications to develop a marketing plan for existing joint-degree programs and those to be developed by the schools in the future, including internet-based materials. The timeline and metrics will be developed in collaboration with the university.

Professional and Continuing Education Programs

Professional and continuing education programs may include a variety of high-quality live, home, and online activities that achieve, retain, and strengthen professional competencies among professionals at Rutgers, throughout New Jersey, and beyond. In many instances, these efforts are mandated by professional licensing bodies and require continuing education credits or units. Many of these programs within RBHS schools have been managed well and are extremely successful, while others have not achieved the same level of success. Further, professional education programs have received varying levels of central-, school-, and department-management support, sometimes with overlapping or duplicating efforts. On occasion, managing entities, usually central administration, have struggled with idiosyncrasies of specific programs because of the unique certification requirements of professional licensing bodies. To avoid duplication and address the idiosyncratic nature of programmatic requirements and other issues, individual schools will be directed to manage these programs in the future. A hybrid management model will be developed by RBHS, in consultation with leadership at each school, until schools that require time to do so are able to transition into this school-based model. Ultimately, implementation will be at the school level, with oversight and coordination provided at the RBHS level. The timeline and metrics will be developed in collaboration with the university.

Clinical Initiatives

Multiple initiatives have been proposed to address: clinical services; the quality of patient care; faculty practice plans, including consideration of joint and/or multi-professional practice plans across schools; and joint department chair appointments to integrate complementary schools and their clinical practices more efficiently. A few of these are described below. Other initiatives will be developed to address these goals during the five-year time period of the strategic plan, responding to the rapidly changing health care environment.

Branding

Many academic health centers have capitalized on recognition of their parent organization's brand name and translated this good will to the academic health center and patient-facing components of the organization. In conjunction with conducting a systemic review of the overall structure of the clinical practices at RBHS and an in-depth analysis of key functional components of the patient care delivery, Rutgers, led by RBHS, will also assess its health care marketing, communications, and branding strategy. This review will ultimately encompass the creation and implementation of a consistent and appropriate overarching sub-brand to be associated with the university's delivery of clinical services statewide, nationally, and globally.

Rutgers enjoys a globally recognized brand associated with a rich, nearly 250-year history. The statutorily designated legal entity and organizational/administrative sub-brand for Rutgers' health care division is "Rutgers Biomedical and Health Sciences," or "RBHS." Presently, multiple RBHS sub-units contribute to the health care mission of delivering care: clinical care, research, community health, and teaching. Rutgers' strategy will be to develop a brand to be associated with the health care delivery umbrella that is easily recognized and understood by the university community, patients, consumers, potential donors, industry partners such as pharmaceutical and biotechnology companies, and the public. This branding effort will help drive consumer recognition of Rutgers broadly and RBHS specifically as high-quality, academically cutting-edge providers of health care services.

RBHS partners with more than 300 affiliates across New Jersey to deliver patient care and provide students clinical training experiences.

Clinical Partnerships

RBHS partners with more than 300 affiliates across New Jersey to deliver patient care and provide students clinical training experiences. Building and expanding relationships with principal teaching hospitals of RBHS is a constant priority. RBHS is currently in negotiations with several hospitals and hospital systems to ensure ongoing clinical and educational opportunities for providers, faculty, staff, and students.

University Hospital

Pursuant to the statute that created RBHS, University Hospital (UH) in Newark is the principal teaching affiliate of the Newark-based RBHS schools. At this time, the Rutgers president, RBHS chancellor, and deans of New Jersey Medical School and Rutgers School of Dental Medicine serve as voting members of the hospital's Board of Directors, who strive to



ensure opportunities exist for productive collaborations between Rutgers and UH and the provision of quality health care for the community.

The RBHS chancellor has been selected to serve on the hospital's strategic planning committee, among other committees. Developing a strategic plan for the hospital jointly with RBHS will result in complementary approaches for fulfilling the clinical, research, and educational missions of both institutions.

Robert Wood Johnson University Hospital

Historically, Robert Wood Johnson University Hospital (RWJUH) has been the principal teaching affiliate of Robert Wood Johnson Medical School. Importantly, the hospital is now the flagship institution of a growing health system—Robert Wood Johnson Health System—which offers opportunities for RBHS. Rutgers president, RBHS chancellor, director of the Cancer Institute of New Jersey, and the RWJMS dean are members of the RWJUH Board of Directors. Current agreements between RBHS and RWJUH include a service co-management agreement with the Cancer Institute and an academic affiliation with RWJMS. At the time of this writing, negotiations are under way to redefine the affiliation between RBHS and the hospital in a fashion that should benefit both partners and ensure the provision of quality health care for the community.



Others

Additional agreements for services are ongoing with multiple hospitals/systems throughout New Jersey, including services negotiated with NJMS, RWJMS, and the Cancer Institute. The restructuring that created RBHS has provided various opportunities with other hospitals and health systems, all under consideration, in the context of the negotiations under way above. RBHS also desires to strengthen and enhance existing clinical relationships with Veterans Health Administration clinical sites, both in East Orange and Lyons.

Accountable Care Organization

The Patient Protection and Affordable Care Act (ACA), which became law in 2010, provides incentives for health care organizations to become accountable care organizations (ACOs) in the belief that ACOs will decrease health care spending and improve quality of care. ACOs, as defined by the Centers for Medicare and Medicaid Services, are “groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high-quality care to their Medicare patients.” The goal is to “ensure that patients, especially the chronically ill, receive appropriate care at the right time, while avoiding unnecessary duplication of services and preventing medical errors.” When an ACO succeeds in delivering high-quality care, as well as spending health care dollars more wisely, it shares in the savings it achieves for the Medicare program.

Robert Wood Johnson Partners (RWJP), a new ACO, became operational in January 2014, as a joint effort of Rutgers, Robert Wood Johnson University Hospital (RWJUH), and the Robert Wood Johnson Health System (RWJHS). Its collaborative background, bridging high-quality clinical care with robust academic and research resources, helps differentiate RWJP from other ACOs.

Through RWJP, 6,000 Medicare beneficiaries now have access to 70 primary care doctors, advanced practice nurses, and approximately 600 specialists, including members of the faculty practice, the Robert Wood Johnson Medical Group, as well as physicians in private practice. All patients have a yearly care plan, making them part of the multidisciplinary team at the point of service, with the practice serving as a patient-centered medical home. Central to the new ACO's efforts is the coordi-



nation of treatment among doctors, other health professionals, and hospitals through more efficient use of electronic health records, as well as restructuring initiatives aimed at improving communication with patients and involving them directly in their care.

Building on the Medicare ACO infrastructure, additional opportunities are being pursued, including the development of New Brunswick Health Partners, which will operate as an ACO under New Jersey's Medicaid program, serving the area's low-income population. Similarly, RBHS clinicians in Newark are working with the Greater Newark Health Care Coalition to develop a Medicaid ACO for that community.

RWJP is designed to create a seamless patient experience, from an individual's visit with a primary care physician, to care from specialists throughout the group or participating network, as well as inpatient or outpatient care provided by RWJUH or one of the more than 70 hospitals and health facilities/providers that comprise RWJHS. While its initial patient base consists of Medicare beneficiaries, RWJP hopes to extend its services to employees of the health system and Rutgers in the near future. Consideration also will be given to extending services to other state employees. An application to participate in the state Medicaid ACO program is also under development, bringing the benefits of RWJP to more vulnerable populations.

Benefits of RWJP to RBHS extend well beyond promoting advanced clinical care for populations. RWJP will create the potential for extensive databases for research, extending from the genetic/molecular level to health systems/population levels. Major research universities are discovering the benefits of integrated delivery systems to enable translational scientific research, and RWJP will help to foster this at Rutgers, likely playing an important role in a Clinical and Translational Science Award application.

RWJP will also create training laboratories for interdisciplinary collaborative care among health and health-related professions. Patient-centered medical homes, a foundational part of RWJP, require advanced team-based care, and through RWJP, Rutgers will have the ability to train tomorrow's collaborative workforce that new health care systems require.

Patient Access Initiatives

To improve ambulatory access, enhance productivity, increase revenue, and respond to increasing financial pressures, the current structure, operation, and performance of the faculty practices are being thoroughly assessed. The objective is to design operational changes, including referrals, scheduling, clinic workflows, care team roles and responsibilities, clinic organization, and leadership and management processes needed to improve access, productivity, and revenue. The design of the



associated policies, processes, roles and responsibilities, skill assessments, organization design, and information technology enablers of practices will be examined. The goals are to increase the patient base, address reimbursement pressures creating the need to render care more efficiently, minimize patient dissatisfaction, reduce cancellations associated with scheduling policies, stem referral leakage from the practice, and improve access to physician care. These efforts to increase access and reduce cost and resource intensity for providing ambulatory services must also occur while maintaining high quality and continuity of care.

An assessment of the Robert Wood Johnson Medical Group (RWJMG) is under way. RWJMS has retained a consulting firm to perform an assessment and assist with implementing changes in business practices. After completion of the initial assessment phase, a preliminary plan will be developed including findings, benchmark status, and recommendations. The improvement plan will include a program management plan, with a design and implementation strategy addressing recommended operational changes. The plan will also include a critically important methodology for tracking progress and impact from associated changes.

The assessment phase of the RWJMG project is nearing completion. Moving forward, the project will enter an implementation phase when recommended changes will be opera-

tionalized in close consultation with clinical faculty and school administration. This will include reorganization of the practice structure, empowerment and accountability of chairs for practice performance, development of a new call management and patient scheduling system to decrease new patient appointment lag time, and greater ambulatory practice room utilization.

Assessment of the faculty practices associated with the New Jersey Medical School is planned for the future.

In addition, to further oral health throughout the state, a review of existing clinical programs will be made and assessed relative to the need in strategic New Jersey markets. Initiatives will be developed to address opportunities, and emphasis will be placed on enhancing the Rutgers School of Dental Medicine's faculty practice, Rutgers University Dental Association, and augmenting the school's extramural service-based, service-learning clinics. Particular attention will be paid to developing service areas that allow the leveraging of other RBHS clinical activities with the ultimate goal of providing comprehensive care to RBHS patients.

Community Service Activities

RBHS faculty are committed to supporting community service activities; many of which are included among the signature programs, emerging signature program, educational initiatives, and clinical initiatives identified above. Other clinical and community services have been and are being provided on an ongoing basis by RBHS schools, centers, institutes, and the behavioral health care unit, especially services focused on behavioral health, dental medicine, environmental and occupational health, health-related professions, medicine, nursing, and pharmacy. All activities address community and statewide needs and fulfill aspects of Rutgers' mission.

In the next five years, many clinical and community service activities are likely to be developed as part of the community health and health systems emerging signature program as that program evolves. Generally, these activities will be developed in coordination with Rutgers scholars with interests in community health, as well as community leaders and state and federal legislators. Implementation will require capacity building within RBHS, including new platforms and sites for the delivery of health care services. In meetings with RBHS leaders, New

Brunswick, Newark, and Camden community leaders and health care providers identified multiple programs that will provide needed services to their communities.

The following will be considered for implementation in the next five years:

- Work with the New Brunswick, Newark, and Camden school systems to develop pipeline, training, and immersion programs in health care fields for high school students.
- Train New Brunswick, Newark, and Camden community members as community health workers.
- Enhance access to primary care and mental health services for New Brunswick, Newark, and Camden residents through development and expansion of ACOs, federally qualified health centers, and other community health centers.
- Train Spanish-speaking New Brunswick, Newark, and Camden community members to serve as interpreters in RBHS primary and affiliated hospitals.
- Work with state legislators to develop incentive programs to encourage RBHS students to remain in New Jersey after graduation.

Other community services may emerge from the creation of new programs, such as those provided by interprofessional education programs. For example, RBHS and other Rutgers students may receive training in coordinated care settings, including an ACO, a federally qualified health center, and/or other community health settings, in which enhanced health-related services are provided to community members during the course of their training.

Finally, the Robert Wood Johnson Foundation (RWJF) has held conversations with the RBHS chancellor regarding its tentative identification of New Brunswick as a city of interest for its healthy cities program. This program has been developed by RWJF to support academic and community partnerships that will address social determinants of health, access to health care, and health disparities. If New Brunswick and Rutgers are selected for this program, funding would be available to support the development of many of the proposed initiatives identified above.

Integration among Schools and across Rutgers

Merger of Nursing Schools

On July 1, 2014, the Rutgers College of Nursing (Newark and New Brunswick) and the Rutgers School of Nursing (legacy UMDNJ) merged to form one Rutgers School of Nursing (SON). The consolidation enables SON to: serve the residents of the state of New Jersey with high-quality care more efficiently; contribute more effectively to improving health outcomes through preparation of nurses, research on health matters, and service to communities; become one of the nation's leading nursing schools by enhancing its depth and breadth and offering a comprehensive array of academic programs; develop greater capacity to participate in interprofessional training and practice and provide high quality of care for the residents of New Jersey; and develop the resources required to contribute significantly to nursing science.

Joint Clinical Chairs

RBHS is home to two allopathic medical schools located approximately 30 miles apart: New Jersey Medical School (NJMS) in Newark and Robert Wood Johnson Medical School (RWJMS) in New Brunswick. Originally affiliated with different parent universities, the two medical schools were combined



by statute in 1970 under the College of Medicine and Dentistry of New Jersey. As geographically distinct entities, the two medical schools developed separate and, at times, complementary clinical practices, patient bases, and research strengths.

With the encouragement of the RBHS chancellor, the two schools have begun to leverage their individual strengths and collaborate. Concurrent vacancies of the same department chairs in both medical schools have opened opportunities for joint recruitment of highly regarded leaders. It also may be beneficial, in some circumstances, to fill a chair in one school by appointing the chair in the other school as chair of both departments. For example, when one school's department is relatively small, joint recruiting can bring together critical masses of clinicians and practice patients. Also, when one school lacks a clinical department, the other can fill the need to build a department and a practice. This model has the potential to significantly grow departmental patient care revenue, training opportunities, and research strength.

An integration committee, led by the chancellor and including the two medical school deans and appropriate chairs, will be formed to consider joint chair appointments and related initiatives.



Designing the Multiprofessional Faculty Practice of the Future

With the implementation of the ACA, health care delivery is facing revolutionary changes. Faculty practice plans of many leading academic health centers are structured to deliver care under the existing provider reimbursement model. As the focus of care moves from individual fee-for-service encounters with ill patients to the health maintenance of entire populations, a primary strategic goal for RBHS is to structure its clinical enterprise to optimize population health in an economically sustainable manner. RBHS is becoming prepared to shift from a volume-based to a value-based system.

RBHS is uniquely positioned to develop the faculty practice optimally suited for the 21st century. Few academic health centers combine a statewide geographic reach, a patient population as diverse as any in the U.S., and the breadth of high-quality multiprofessional educational programs across the provider spectrum as RBHS does. RBHS is well positioned to facilitate the dissemination and implementation of research findings to applications in clinical practice and population health.

To capitalize on these advantages, in the next year RBHS will examine new models for a multispecialty, multiprofessional faculty practice plan. As envisioned, such a plan may encompass all clinical service units within RBHS. The practice plan may incorporate under one umbrella all the clinical departments of multiple schools, clinical care units, geographic campuses, and a wide range of licensed providers, including, but not limited to, physicians, dentists, advanced practice nurses, including nurse practitioners, midwives, nurse anesthetists, physician assistants, physical therapists, and other allied health professionals. As such, the practice plan could include faculty from the Cancer Institute, NJMS, RSDM, RWJMS, SHRP, SON, and UBHC and will utilize the branding strategy identified above. The design and structure of this plan ideally would be configured to position RBHS optimally for the imminent changes in the health care delivery and payment systems.

Key objectives in designing a new plan include:

- maintaining provider incentives for productivity;
- empowering providers and the schools to speak with one voice to have the strongest hand in negotiating with insurers and hospital systems;

- creating a setting that allows RBHS schools to be financially viable while supporting the academic mission;
- developing a network that can become a preferred provider of care for health systems, Rutgers, and state employees and their dependents; and
- creating a structure that will position RBHS optimally to compete in the new world of health care, where providers—not only insurers—will be assuming the risk for population groups.

A plan will be implemented based on advice and expertise formally provided by a consultant. A two-phase approach is envisioned. The first phase—assessment—will include:

- initial review of current practice plans' corporate structure, governance, and strengths and weaknesses;
- a review of current trends to understand where the U.S. health care system is likely headed, which will serve to influence the design of the new faculty practice plan;
- a review of representative plans from other institutions and determining their potential relevancy; and
- interviews with RBHS staff/personnel to assess relative strengths and weaknesses that could impact the new practice plan model.

The second phase—design and development—will be addressed following completion of the first phase. Activities will include:

- meetings with key stakeholders, including leaders of the current practice plans and involved schools, and representatives from the chancellor's office;
- developing key principles to direct final plan design, including maintaining provider incentives for productivity, empowering providers and schools to speak with one voice, creating a setting that allows RBHS schools to be financially viable, and creating a structure that will position RBHS for the new world of health care where providers assume the risk for whole populations, rather than insurers;
- providing expertise, identifying current practice plan models or developing alternative models, and providing recommendations for the development of a new multispecialty, multiprofessional faculty practice plan that may encompass all clinical components of RBHS or a subset under one umbrella organization;



- designing a faculty practice plan tailored to the history and structure of RBHS, given the key principles and the direction in which health care is evolving; and
- submitting a report to the RBHS chancellor.

Formation of the practice plan would follow in future years.

Reorganizing and Strengthening PhD Programs in Biomedical Sciences

The establishment of RBHS within Rutgers provides an opportunity to create an integrated infrastructure that will support the education and training of biomedical/health sciences research teams of the future, break down traditional silos, and enhance opportunities for interdisciplinary and translational research training. To accomplish this goal, RBHS and Rutgers–New Brunswick biomedical science graduate educational leaders are developing a plan to consolidate RBHS and Rutgers Graduate School–New Brunswick doctoral programs in the biomedical sciences. These programs would be housed in an expanded RBHS Graduate School of Biomedical Sciences (GSBS). GSBS would, in turn, be one component of a proposed new and encompassing organization, tentatively identified as the division of graduate studies, which would oversee all graduate education programs at Rutgers–New Brunswick.



The coordination of biomedical science programs across RBHS and Rutgers–New Brunswick will enable GSBS to play a leading national role in the development of new curriculum and broader opportunities for the biomedical scientists of the future, preparing students for careers in academics, industry, government, and the private sector. The consolidation of programs will also encourage and facilitate research collaborations among biomedical scientists within RBHS and across Rutgers–New Brunswick. Further, the consolidation will raise the visibility of biomedical science graduate education at Rutgers and attract top students from premier colleges across the country and the world.

Discussions also are under way to develop initiatives to strengthen the PhD programs in biomedical sciences. Emphasis will be placed on recruiting fewer and stronger students and attracting the best international students. The GSBS assistant dean of global initiatives (newly created position) will work with GSBS leadership and faculty to identify and secure partnering opportunities with leading universities, particularly in Asia and South America. Memoranda of understanding are being developed with leading institutions in India, Indonesia, and South Korea to explore the development of exchange programs for biomedical science students and faculty, identify opportunities for dual-degree and cotutelle programs (two mentors from two different universities mentoring a single student), and recruit top students from leading universities.

In addition, it is expected that the development of strong collaborative research teams, which will result from the strengthening and integration of biomedical science training programs, as above, will put Rutgers in a stronger position to compete for pre- and postdoctoral training grants. In anticipation of this development, GSBS is mounting a new initiative that will both incentivize and support new training grants within the biomedical sciences. GSBS plans include the development and maintenance of centralized databases of faculty mentors and their training activities, provision of salary support for training grant principal investigators, and provision of over-the-cap supplements to cover trainees' tuition and fees. New training grants will increase institutional stature, provide funding for graduate students and postdoctoral fellows at a critical time, support the research needs of our current faculty, and provide additional incentives for faculty, student, and postdoctoral recruitment. In the future, all full-time PhD students will receive 100% support for stipend and tuition.

Reorganizing the Basic Sciences across Rutgers

The integration of Rutgers and UMDNJ in 2013 occurred in the midst of an unprecedented period of growth in access to patient genome sequences and complementary data coming from high-throughput measurements of biological systems. This “perfect storm” of institutional change and the big data revolu-

tion demands that Rutgers, as an institution, develop a strategy defining the optimal means by which the Rutgers arts and sciences, engineering, and environmental and biological sciences schools should seek to collaborate with the basic science and clinical departments of RBHS. One of the specific issues to be addressed is the number of existing basic science departments within RBHS alone, as well as across the broader institution.

The potential reorganization of academic units across Rutgers is a strategic priority for Rutgers and was recommended as part of the Rutgers strategic plan. Accordingly, a universitywide Committee on Academic Unit Organization has been formed to consider the reorganization of academic units across Rutgers and then to provide recommendations. It is anticipated that basic science units, particularly those within Rutgers–New Brunswick, Rutgers–Newark, and RBHS, will be a focus. RBHS is well represented on this committee and will participate actively.

In addition, an RBHS task force will be created shortly after the strategic plan is finalized to work in collaboration and coordination with the universitywide committee to consider reorganization options in the basic sciences within RBHS. The task force, formulated by RBHS leadership in consultation with the RBHS Faculty Council, will consist of representatives of each of the RBHS schools with basic science departments. The RBHS task force will:

- establish and promulgate overarching principles and affirm community standards/values governing the RBHS reorganization process, with particular emphasis on transparency;
- determine what issues need to be addressed, if/where reorganization is to occur;
- develop specific objectives to address these issues;
- define the scope of a potential basic science reorganization;
- determine the motivations for a basic science reorganization;
- determine the relationship between the RBHS basic science reorganization effort and the Rutgers reorganization effort, and identify mechanisms of interaction to ensure congruity;
- conduct external data gathering regarding the ways in which peer and aspirant institutions have sought to reorganize related academic disciplines in similar situations, the objectives and expected benefits of these reorganizations, and successes and failures and other lessons learned of these reorganizations;

The potential reorganization of academic units across Rutgers is a strategic priority and was recommended as part of the Rutgers strategic plan.

- conduct internal (RBHS) data gathering regarding what is meant by “basic sciences”—identifying all basic science faculty by this definition, basic science research programs and financial/support information regarding each, teaching activities of each basic science program, basic science outreach programs, and the location and utilization of all shared facilities/equipment and resources;
- examine through interviews the lessons learned from prior reorganizations of the biological sciences at Rutgers (1978–1980, circa 2000, and the RWJMS basic science reorganization of circa 2010), and identify the strengths and weaknesses of the status quo within all basic science units;
- establish the role of the Rutgers University Senate in the process of any basic science reorganization;
- identify and solicit participation from stakeholders (alumni; undergraduate and graduate students; postdoctoral fellows; staff researchers and technicians; tenure-track and nontenure-track faculty; emeritus faculty; department chairs; deans; chancellors; center, bureau, and institute leadership; and external advisers);
- empower key stakeholders to formulate broad objectives and enumerate expected risks and benefits, both internal and with respect to external perceptions/rankings, for undertaking a basic science reorganization;
- establish a precise date by which these objectives and expected benefits will be subject to public comment across the Rutgers basic science community;
- establish action plans with interim objectives and assess resource needs to achieve specified objectives;
- identify and involve individuals affected by action plans/objectives;



- link action plans to objectives and access to necessary resources enabling achievement of overall goals, and include periodic interim review, with accountability for transparent reporting;
- organize working groups to implement specific objectives via defined action plans;
- prior to implementation, establish an accepted system of metrics for assessing the quality of the implementation (i.e., how could this have been done better?) and achievement of goals and objectives (i.e., did this achieve what was expected and was the effort worthwhile?);
- establish a date by which assessed outcomes will be reviewed and questionable elements of the reorganization will be reexamined and either further refined or abandoned; and
- establish a date by which a scholarly report detailing the Rutgers experience will be made public.

Finally, the RBHS task force, working with the universitywide task force, will identify a timeline and metrics for these specific initiatives.

Roles of Centers and Institutes

RBHS centers and institutes, as well as other Rutgers centers and institutes, represent an important mechanism for promoting interdisciplinary research and training, and overcoming

some of the more significant challenges posed by geographic and structural impediments to synergy that are typical of large institutions. Centers and institutes have provided a critical avenue for entrepreneurial members of the faculty to pursue career objectives not well served by traditional departmental and other structures. At present, more than 200 centers and institutes exist throughout Rutgers, although only a handful are “autonomous responsibility” centers. Membership rosters range from one or a few individuals to hundreds of faculty members. Some are virtual in nature, while others are housed in a single building.

Organizational *raison d’être* for centers and institutes within RBHS and the basic and applied sciences include utilization of shared technology/instrumentation, a commitment to treating related diseases, a commitment to understanding the origins of disease pathogenesis, and engagement in interdisciplinary and interprofessional collaboration, with much broader rationales for other areas of the university. These apply to the new Brain Health Institute and the four major RBHS centers/institutes: Cancer Institute of New Jersey; Center for Advanced Biotechnology and Medicine; Environmental and Occupational Health Sciences Institute; and Institute for Health, Health Care Policy and Aging Research (IFH). For example, IFH has facilitated collaboration among 12 disciplines within the School of Arts and Sciences and six professional schools in New Brunswick, Newark, and Camden and serves as an important bridge in conducting health and health policy research across Rutgers.

There is a need to review existing center and institute policies, recommend the revision of existing policies and/or development of new policies, work with Rutgers–New Brunswick, Rutgers–Newark, and Rutgers–Camden to coordinate policies universitywide, then create a new policy manual for the university policy library. In addition, several management-related issues must be addressed, possibly by implementing responsibility center management (RCM). Issues include:

- collecting, compiling, and analyzing essential information characterizing the centers and institutes (and related initiatives), beginning with a comprehensive inventory of each one;
- developing a precise definition of what constitutes a Rutgers center or institute;
- ensuring that Rutgers center and institute operations, governance, reviews, and succession planning follow best

practices, perhaps those established by the Association of American Medical Colleges, with transparency to both membership and institution leadership;

- establishing sustainable business models for center and institute operations that incentivize pursuit of federal and private funding by appropriate sharing of indirect cost returns and other revenues with faculty, centers and institutes, schools and departments, and central administration, while minimizing perverse incentives and barriers to collaboration;
- engaging Rutgers centers and institutes in systematic, ongoing efforts to promote and participate in cross-disciplinary, cross-campus, and multi-institutional collaborations; and
- developing administrative and regulatory processes that are fully integrated and honored across the entire university.

Additional Integrative Activities

The integration of UMDNJ and Rutgers has created considerable opportunities for collaboration and synergy. In addition to collaborations previously identified, RBHS will explore opportunities and develop plans to collaborate with the following non-RBHS entities or programs: the One Nutrition Initiative, which is to be a consortium administered through the Institute for Food, Nutrition, and Health, designed to address major nutrition-related issues and challenges; and the Rutgers Institute for Emergency Preparedness and Homeland Security, a multi-disciplinary center of excellence, which will be a collaborative partner with NJMS and RWJMS departments of emergency medicine, among others.

In addition, RBHS will participate in the following programs led by Rutgers–New Brunswick: the New Brunswick Academic Portal, designed to link and organize programs and activities with common themes; the Health, Wellness, and Science in the Community Campus Summit, which will be a two-day conference with the aim of promoting networking and exploration of cross-disciplinary collaborations for faculty engaged in basic, clinical, and translational health and wellness research and practice; and the Alumni Shadowing Program, led by the Health Professions Office, which will link Rutgers–New Brunswick undergraduate students interested in the health professions with practicing clinicians. Finally, RBHS will participate in universitywide activities and practices that will promote Rutgers’ public mission by: continuing to participate in

Rutgers Day; maintaining inclusive recruitment and retention guidelines for faculty and staff; and supporting undergraduate pipeline programs for high school and undergraduate students, particularly for those with interests in the health professions, science, and technology.

Other Enabling Structures

Three additional enabling structures have been selected for support and investment during the five-year strategic plan. **By advancing institutional stature, supporting faculty development, and addressing facilities challenges, RBHS will enhance its ability to support signature programs, complementary programs, and educational initiatives, as well as research, educational, clinical, and community service programs more broadly throughout RBHS.**

Advancing Institutional Stature

Stature and reputation are extremely important to RBHS schools, units, and programs. The strategic plan provides a significant opportunity to address current national rankings, most commonly provided by the lay press. While rankings for medical schools are based in part on quantitative data provided by the schools themselves, including faculty research activity, student selectivity, and faculty resources (e.g., ratio of full-time



science and clinical faculty to full-time students), all or nearly all rankings for other professional schools, including biomedical sciences, health related professions, nursing, pharmacy, and public health, are based purely on subjective measures such as peer evaluation. Even for medical schools, 40% of the weighted average of *U.S. News & World Report* rankings, the most commonly referenced ranking, is based on peer assessment. No ranking systems exist for dental medicine education.

Regardless of the lack of quantitative merit attributed to the rankings, they provide an important window into how the world views RBHS programs. Consequently, rebranding or augmenting the brand of RBHS schools is extremely important and must be addressed in the five-year RBHS strategic plan. Specific plans include:

- educating faculty, senior administrators, and Rutgers alumni regarding the criteria by which RBHS schools and programs are evaluated by national ranking publications, including focusing on achieving metric-based improvements during the implementation of the RBHS strategic plan;
- educating faculty on the importance of the media and coverage of notable research, clinical, educational, and service activities;
- assisting faculty in joining national honor societies and in participating as leaders in national societies;



- developing a marketing and communications strategy;
- developing “Rutgers Health” as a unifying brand for RBHS health care delivery;
- promoting excellence in high-quality scholarship, services, and discoveries;
- developing signature programs described above;
- developing new standards and criteria for appointments and promotion;
- limiting solicitation of external faculty promotion evaluations to those more likely to achieve promotion;
- increasing faculty size through creation of additional faculty tracks (see “Faculty Development” below);
- increasing school selectivity by soliciting more applications from out-of-state students; and
- selecting one or more peer and one or more aspirant schools, conducting an in-depth study of the methods and metrics utilized and achieved by each to improve or maintain their rankings, then applying the results to developing a plan that will enable RBHS schools to improve their national rankings to levels approaching peer aspirant rankings.

A task force overseen by the chancellor’s office will be created to focus on advancing school stature.

Faculty Development

To achieve excellence and become a leading institution in all biomedical and health science disciplines, RBHS must ensure that structures and policies are in place to support the development of faculty careers from initial appointment through retirement. While some turnover is to be expected and even desirable (e.g., those leaving due to growth opportunities elsewhere or, conversely, lack of productivity), the faculty is an institution’s most valuable asset and disproportionate and undesired departures are a substantial risk to the institution.

Two approaches were utilized to address this important issue. A working group overseen by the RBHS Strategic Planning Steering Committee focused on faculty retention as an infrastructure need. In addition, two senior RBHS faculty were appointed as interim provosts to review faculty appointment and promotion criteria and recommend standardized policies across RBHS consistent with universitywide policies.

The faculty retention working group, composed of members of eight RBHS units, reviewed recent faculty retention in the health sciences literature, examined existing data on faculty separations from the former UMDNJ and the Ernest Mario School of Pharmacy, reviewed results from two recent surveys completed by New Jersey Medical School faculty, and distributed a survey to current RBHS faculty modeled after a survey assessing organizational culture and faculty intentions to leave, published in *Academic Medicine* in 2012. Survey results include high levels of faculty dissatisfaction and low morale with a number of faculty considering departure, which warrant immediate and direct intervention.

Some faculty issues may be addressed quickly, once faculty become aware of comprehensive plans being developed as part of the RBHS and Rutgers-wide strategic plans. Recommendations for faculty tracks, promotion criteria, and promotion review procedures are in development. It is anticipated that publication and implementation of these recommendations will address some faculty concerns. Other issues being addressed currently or in the near future include efforts by Rutgers to simplify administrative processes and RBHS efforts to elevate institutional stature, develop new compensation plans, provide compensation increases for productive faculty, and develop concrete productivity metrics for all components of the RBHS mission.

However, additional steps need to be taken. The faculty retention working group submitted a report to the steering committee that focused on recommendations to address faculty morale; resources needed to support faculty research, educational, and clinical activities; mentoring and faculty development; and retention of high-performing faculty. The following recommendations have been incorporated into the strategic plan:

- improving faculty morale and investing in resources that support research, clinical, and teaching activities of current faculty;
- addressing factors influencing intention to leave, specifically by addressing compensation, benefits, and other collective bargaining issues expeditiously;
- strengthening and expanding the roles of Faculty Affairs offices, including the tracking of and reasons for departures;
- establishing formal mentoring and faculty development programs;

RBHS's focus on targeting academic excellence by recruiting, retaining, and supporting faculty is a key point of emphasis in the Rutgers strategic plan.

- retaining high-performing faculty members through the budgeting of retention packages as strategic initiatives, analogous to recruitment packages;
- systematically collecting and compiling faculty retention and separation data in each school to track trends and the success/failure of retention efforts to enhance regular review and modification of faculty retention strategies;
- recruiting and supporting diverse faculty and leadership to reflect the demographic composition of local communities and New Jersey more broadly, in terms of race/ethnicity, gender, and native status; and
- analyzing RBHS faculty and staff salaries to ensure salary and gender equity.

Recruitment and retention guidelines will reflect the university goals of inclusiveness and equity. Special efforts will be made to recruit and retain faculty with interests in health disparities and cultural competencies.

Indicators of success of measures undertaken to address faculty retention will include lowering annual voluntary departures due to dissatisfaction with the institution and successes in retaining high-performing faculty. Other desirable outcomes include improved faculty satisfaction relating to institutional commitment, increased level of enthusiasm for performance, improved confidence in one's ability to advance, improved trust/inclusion/connection, decreased ethical/moral distress, increased leadership aspirations, and a more positive environment that impacts the institution's reputation, facilitates recruitment, and advances the academic experience.

As the second component of the broader faculty development endeavor, senior faculty from Robert Wood Johnson Medical School and New Jersey Medical School were appointed as



interim provosts from January through June 2014. Together, they led an initiative to draft revised and standardized appointment and promotion criteria for faculty appointed primarily in RBHS schools, while working to ensure consistency with universitywide policies. Their objective was to produce guidelines to assist faculty in choosing a career pathway that would enable them to achieve their professional aspirations, maintain high standards of excellence for RBHS, and facilitate the recruitment, appointment, promotion, and retention of an outstanding team. The interim provosts reviewed guidelines from various universities highly regarded in biomedical and health sciences and spoke with academic leaders from some of these outstanding institutions to learn which elements of their guidelines were most effective. In addition, the interim provosts also familiarized themselves with guidelines from several of the existing RBHS schools.

The interim provosts catalogued guidelines and conversations and identified criteria and pathways that were successful at other institutions, then drafted and revised a proposal for RBHS based on their understanding of the structure and function of RBHS schools. Drafts were shared with, and input requested from, RBHS deans, senior associate deans for faculty affairs or their equivalent for RBHS schools, chairs of the appointments and promotions committees of RBHS schools, members of the RBHS Faculty Council, and current and future presidents of the Master Educators' Guild. Multiple open

meetings were held with the faculty and feedback was solicited and obtained as well via email. In response, the recommendations have been substantially revised. These recommendations remain preliminary, subject to ongoing review and consideration by various RBHS faculty organizations, including the Faculty Council. A faculty handbook will be created that will include detailed information about faculty tracks, the appointment and promotion process, and criteria.

Even after review, approval, and implementation, it is anticipated that criteria and procedures will be reassessed and revised regularly to address specific or general issues or inconsistencies, based on ongoing faculty input. Once criteria and procedures have been approved, the provosts will conduct training and information sessions for department chairs and each school's appointments and promotions committee, then hold Q&A sessions to which all faculty will be invited. Training and Q&A sessions will be conducted annually in subsequent years.

RBHS's focus on targeting academic excellence by recruiting, retaining, and supporting faculty, as well as creating a culture that recognizes and rewards exceptional and productive faculty, is a key point of emphasis in the Rutgers strategic plan. RBHS faculty development and related programs will be integrated with the universitywide plan and the plans of the primary universities, as appropriate, and RBHS will be represented on the Rutgers Promotion Review Committee.

Facilities

Substantial RBHS physical plant/building/maintenance challenges must be addressed, as determined during the chancellor's listening and facilities tours in fall 2013, and illustrated in a survey of RBHS faculty, staff, and students. Maintenance has been deferred for too long, some space is badly in need of repair, some key space is in need of replacement as soon as is feasible, and well-maintained space is underutilized.

Responsibility Center Management will lead to more rational and appropriate allocation of the best space, and selective investments will be made to renovate existing space as needs arise and funds become available. (For example, the RWJMS Research Tower in Piscataway can be renovated floor by floor, mobilizing resources as needed.) Suitable space will be better utilized by assigning funded investigators into the best available space.

During the first year of the strategic plan, the overall space utilization across RBHS will be evaluated and intensified. Where possible, funded investigators will be moved out of poorly maintained space into well-maintained space; well-maintained space also will be assigned to newly recruited investigators. Over time, as additional funding becomes available, resources will be mobilized for space renovation.

Financial and Development Challenges and Strategies

Although the integration of UMDNJ and Rutgers occurred on July 1, 2013, several outstanding operational, programmatic, and financial challenges and opportunities remain. While many of the current RBHS entities have been well managed, uniform and standardized administrative and financial policies are needed to address fundamental administrative challenges, ineffective research, administrative infrastructure, a lack of policies RBHS-wide, and poor financial performance. More specifically, these include:

- developing a new approach to leadership accountability across RBHS;
- revising the appointment and promotion process;
- evaluating tenure and nontenure faculty tracks and redesigning them with appropriate criteria for appointment and promotion;

- renegotiating many expired and expiring union contracts;
- creating collaboration among researchers across disciplines and sites;
- increasing below average or low faculty productivity, a result, in part, of a lack of financial or other incentives and inadequate administrative, research, and clinical support structure to enable and promote productivity;
- resolving lack of faculty pay increases for many years, resulting in, among other issues, low faculty morale;
- improving efficiency of workspace;
- improving the logistics of programs within RBHS that are geographically scattered and providing the technology to foster more efficient meetings;
- improving financial reporting and the ability to obtain data, evaluate new systems, and expedite implementation;
- addressing the different financial systems used by legacy UMDNJ and legacy Rutgers entities;
- removing the inadequacy of patient access and enabling systems;
- improving the substantial structural deficit at RWJMS and the less than break-even performance of NJMS;
- clearing the significant deficits in some fund balances that cannot compliantly be supported with surpluses in other fund balances, though the RBHS fund balance (restricted and unrestricted) is positive at a high level, and addressing the funds shortages for facility renewal and repairs to many buildings and infrastructure;
- renegotiating the relationship between the medical schools and affiliate hospitals, especially in the context of the substantial investments to be made;
- strengthening investment in the academic enterprise and in recruitment of world renowned faculty leaders; and
- continuing to transition certain functional administrative units (human resources, financial reporting, information technology, facility, and real estate services) from the former UMDNJ central administration to the central Rutgers administration.

A series of strategies, some of which have been noted earlier, have been and will be implemented to address these financial

and administrative challenges and improve financial performance within schools/units and across RBHS. They include:

- measuring faculty productivity transparently across RBHS and across missions;
- issuing nonrenewal appointments where appropriate, and designing a new faculty compensation plan to reward productivity;
- developing and implementing new promotion rules;
- evaluating nonfaculty staffing levels and required key competencies;
- improving research administrative infrastructure;
- exploring new hospital partnerships/affiliations and negotiating new contracts with affiliate hospitals to ensure adequate payment for services;
- investigating new multiprofessional and interschool faculty clinical practice models;
- leveraging existing state funding for fringe benefits more effectively;
- developing financial statements for each department within schools, with department chairs and division directors being held accountable for improving financial performance;



- studying via task force whether to restructure basic science departments across medical schools and non-RBHS schools;
- recruiting to fill interim dean, chair, chief, and other leadership positions where appropriate;
- developing and maintaining a position control approval policy within the RBHS chancellor's office;
- continuing to improve patient access;
- analyzing revenue-cycle and collection rates for cost savings;
- rolling out the RCM system in fiscal year 2016;
- increasing the number of sponsored-program proposals and awards, especially in the areas of the signature programs and complementary areas, described above;
- conducting a more thorough analysis of the administrative infrastructure; and
- allocating controllable expenses to departments based on utilization (e.g., use of nurse practitioners and physician assistants); recruiting new chairs for key departments; leveraging synergies between NJMS and RWJMS; and working with department chairs on innovative revenue enhancement strategies.

Funding the Strategic Plan

Plans for signature programs will require substantial investment. RBHS strategic initiatives will be funded in their first year, in part, by contributions received from each RBHS entity representing 2% of its revenue. These funds will be deployed by the chancellor's office, generally matching funds provided by the entities, based on three criteria: the quality of any recruit, whether the investment has interschool impact, and the priorities of this strategic plan. In future years, this funding will be replaced by a strategic fund to be made available through RCM. In addition, 5% of existing funding used by RBHS entities for traditional, ongoing operating expenses has been reallocated within the entity's budget in fiscal year 2015 for strategic investments to help drive programmatic development within the schools, centers, and institutes. The use of these funds will be tracked, confirming their use as planned. Some funding also will be provided through financial improvement strategies, as noted above, and as the RBHS schools under financial stress improve their standing, funding will be available

for more rapid investment. The speed at which the strategic planning initiatives are implemented will depend, in part, on how quickly these schools are able to address their financial challenges.

RBHS also will take advantage of the alignment of RBHS and Rutgers strategic initiatives to fund some of its priorities. Opportunities include Henry Rutgers University Professors (recruitment of senior scholars), Henry Rutgers Term Chairs (for mid- to early senior-level faculty), and targeted funding for administrative leadership positions (emergency and disaster preparedness, big data, global health, and bioethics). An example of a potential aligned initiative is the Rutgers research evaluation and commercialization hub (REACH) NIH grant proposal, which, if funded, would provide infrastructure support for researchers to engage in technology commercialization activities.

Also, the New Jersey Health Foundation has generously agreed to provide pilot grants to support RBHS signature programs (three grants of up to \$100,000 each for multidisciplinary teams), intended to lead to larger, federally funded multi-investigator grants (center grants or program project grants). Applications will be given higher priority if they also assist in developing one or more complementary programs and demonstrate an intention to leverage strengths across disciplines leading to collaborations. Additional funding will be made available in future years as well.

Finally, as part of the reorganization of development across Rutgers and the reorganized Rutgers University Foundation, a major effort will be made for fundraising for RBHS, focusing on the strategic plan priorities and leveraging the increasingly favorable public and donor recognition of the RBHS brand. Toward that end, a new vice president for development has been hired and began in September 2014, charged with reorganizing the RBHS development efforts and leading major efforts to generate new funding for RBHS initiatives.

Moving Forward

Strategic plans are not intended to be static, but rather living documents that will serve as guides. The RBHS strategic plan is subject to change and reassessment following implementation. The RBHS Strategic Planning Steering Committee, consisting of RBHS school and unit faculty representatives, including members of the RBHS Faculty Council, as well as staff, student, community, principal hospital, and non-RBHS Rutgers faculty representatives, will annually review the strategic plan and progress on meeting each of its objectives. Metrics established for each initiative will be used to measure success.

Implementation of the RBHS strategic plan has already begun, but the planning continues. The RBHS plan is being shared with the other chancellors, just as their plans are being shared with RBHS. It is anticipated that common interests and initiatives will be linked and additional initiatives will emerge to further strengthen Rutgers.

Conclusion

The RBHS chancellor and the RBHS leadership thank the RBHS Strategic Planning Steering Committee, the more than 500 faculty members who participated as members of the RBHS strategic planning working groups and committees, particularly the co-chairs, and the more than 5,000 Rutgers faculty and RBHS staff, students, and alumni who responded to surveys. The efforts of the working groups were particularly important, as their reports submitted identified existing strengths upon which stronger and nationally prominent programs can be built, other programs with potential for future growth, and synergies that will enable new programs to be developed.

Through assistance provided by the RBHS and broader Rutgers community, RBHS is poised to achieve its aspiration to be recognized as one of the best academic health centers in the U.S., known for its education, research, clinical care, and commitment to improving access to health care and reducing health care disparities.

RUTGERS BIOMEDICAL AND HEALTH SCIENCES

The 2012 New Jersey Medical and Health Sciences Education Restructuring Act established Rutgers Biomedical and Health Sciences (RBHS) in July 2013 as the health care education, research, and clinical division at Rutgers. RBHS comprises most of the units of the former University of Medicine and Dentistry of New Jersey (UMDNJ), which was dissolved under the 2012 statute, and several existing Rutgers units with health-related missions. The integration of these units, which now includes eight schools, four centers and institutes, and a behavioral health care network, has resulted in a single division that will provide new models for clinical care and community service, educate the next generation of health care providers utilizing team approaches to care, and conduct basic science, public health, and clinical research. These entities are geographically located at Rutgers University–New Brunswick, including facilities in Piscataway; at Rutgers Health Sciences at Newark, Scotch Plains, and Stratford; at Rutgers University–Newark; and at additional locations in New Jersey. RBHS, integral to Rutgers’ mission, works synergistically with many other academic, research, and clinical units throughout Rutgers and the region.

With the establishment of RBHS, Rutgers now stands as one of the nation’s largest, most comprehensive university-based centers for studying and improving human health and health care. Rutgers is now uniquely equipped to transform lives through the advancement of medical innovation, the provision of direct patient care supported by the latest research findings, and the education of a full complement of health care professionals.

The eight RBHS schools collectively comprise New Jersey’s largest and most influential constellation of academic institutions devoted to medicine, dentistry, advanced health-related sciences, pharmacy, public health, nursing, and the full spectrum of allied health careers. Highly regarded programs are taught by outstanding faculty at multiple locations throughout the state.

RBHS health care providers deliver a wide range of high-quality patient care services across the state of New Jersey. Faculty practices currently operate at New Jersey Medical School, Robert Wood Johnson Medical School, School of Dental Medicine, School of Health Related Professions, and School of Nursing. University

Behavioral Health Care is one of the nation’s largest behavioral health care networks. RBHS also partners with a broad network of hospitals and health care facilities to deliver patient care and provide educational experiences for students. Clinical revenues account for roughly half of the RBHS budget. RBHS logs over 1.7 million patient visits annually and conducts more than 350 clinical trials across 27 clinical sites.

For Rutgers and the region, the advantages of having a highly regarded integrated health care division attached to The State University of New Jersey are considerable, as Rutgers is poised to attract more top-flight faculty and students, deepen its research collaborations, optimize the coordination of health care for residents, conduct cutting-edge health care research and discovery, accelerate economic growth, and attract public and private partnerships and support.

RBHS Schools

Ernest Mario School of Pharmacy



The Ernest Mario School of Pharmacy (EMSOP) has a long and illustrious history, dating back to 1892 when the pharmacy program was located in Newark. Since 1971, the school

has been housed primarily in the William Levine Building on the Busch Campus in Piscataway. EMSOP is a leading educational institution dedicated to excellence in health care and biomedical education, innovative and visionary research and scholarship in the pharmaceutical sciences, exemplary clinical practice, partnerships with industry, and outreach and community services that address the needs of the citizens of New Jersey and society at-large.

The pharmacy school is built on four pillars: research, teaching, clinical practice, and service. The school has a total of 99 faculty in five departments: Chemical Biology, Pharmacy Practice and Administration, Pharmacology/Toxicology, Pharmaceutics, and Medicinal Chemistry. Key areas of research include cancer and

cancer prevention; toxicology and environmental toxicology; drug metabolism and drug transporters; novel antibiotics, anticancer drugs, and chiral chemistry/asymmetric catalysis; drug delivery and nanotechnology; and medical countermeasures against chemical threats. In addition to work in their own laboratories, pharmacy school faculty are actively engaged in major research programs with the Cancer Institute of New Jersey and the Environmental and Occupational Health Sciences Institute (EOHSI). Pharmacy school faculty received a total of \$21,746,696 in extramural awards in FY 2013 (\$18,269,559 in direct costs and \$3,477,137 in indirect costs). Of this total, \$10,129,731 was received from the National Institutes of Health (NIH) (\$6,806,748 in direct costs and \$3,322,983 in indirect costs). These figures include the nearly \$8 million in annual funding provided primarily by industry partners to support the school's highly regarded Pharmaceutical Industry Fellows program, the largest such program in the U.S.

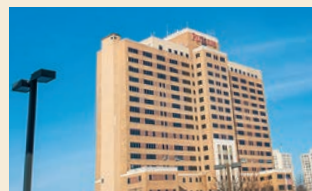
The school offers a preeminent doctor of pharmacy (PharmD) program, which provides students with a strong foundation in basic and clinical sciences coupled with an emphasis on patient-centered care. The program offers diverse opportunities and experience in clinical practice, industry, public health agencies, managed care, and laboratory and computational research. Approximately 200 students complete the PharmD each year. Students benefit from the revamped research honors program, which has grown from 13 to 49 students since its inception two years ago. Students also benefit from dual-degree programs: PharmD/PhD, PharmD/MBA, PharmD/MPH, and PharmD/MD (the first such program in the U.S.).

Faculty direct three PhD/MS programs for approximately 90 students, in medicinal chemistry, pharmaceuticals, and toxicology, offered jointly with Robert Wood Johnson Medical School. In September 2014, the school launched a new MS program in health outcomes, policy, and economics, offered jointly with the School of Public Health. Faculty are also involved with other MS and PhD programs, including multidisciplinary research training opportunities in pharmaceutical and biomedical sciences, pharmacoeconomics, and related health and basic science fields, offered in collaboration with colleagues throughout Rutgers.

Pharmacy practice clinical faculty maintain practices at 20 key hospital sites in northern and central New Jersey, including Robert Wood Johnson University Hospital, Hackensack University Medical Center, and Barnabas Health. Primary clinical practice areas include general internal medicine, infectious disease, critical care, emergency medicine, pediatrics, oncology, and neuropsychiatric pharmacotherapy. In addition, comprehensive clinical residency and fellowship programs in diverse fields, including pharmacy practice, the pharmaceutical industry, and health outcomes research, are available to postdoctoral trainees. Finally, continuing education programs promote achievement, retention, and strengthening of professional competencies, support lifelong learning opportunities, and serve the varied educational needs of the pharmacy practitioners of New Jersey.

Currently, the pharmacy school utilizes 95,928 assigned square feet of space, which includes its primary space in Levine and additional space on the Busch Campus, including substantial space in the Susan Cullman Lehman Laboratory for Cancer Research, and limited assigned space in EOHSI and the Gordon Road Facility. New space will be provided in the future with a planned building addition, the Teaching, Simulation, and Research Complex. This new facility, to be built adjacent to Levine, will provide state-of-the-art teaching and research space for EMSOP, support collaborative programs, and offer schools and units within RBHS access to shared facilities and equipment and laboratories capable of advanced simulation education.

Graduate School of Biomedical Sciences



The Graduate School of Biomedical Sciences (GSBS), founded in 1969, provides graduate training in the basic biomedical science disciplines and offers MS and PhD degree programs in Newark

and New Brunswick/Piscataway. The GSBS teaching mission is to develop scientists who will contribute new knowledge in the biomedical disciplines through creative research and scholarship, and become the future scientific leaders in academics, industry, and government. Currently, GSBS draws its more than 500 faculty primarily from the medical and dental schools of RBHS: New Jersey Medical School (NJMS) and the School of Dental Medicine (RSDM) in Newark, and Robert Wood Johnson Medical School (RWJMS) in New Brunswick/Piscataway. Additional faculty with primary appointments in Rutgers Graduate School–New Brunswick (GSNB) and New Jersey Institute of Technology (NJIT) also participate, as do adjunct faculty with appointments in industry. GSBS utilizes space and classrooms within the medical schools and dental school. Currently, more than 700 students are enrolled in GSBS programs.

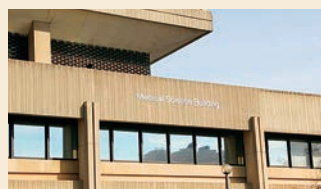
GSBS provides graduate training across the spectrum of biomedical sciences. The PhD programs encompass studies in: molecular biology, molecular genetics, biochemistry, cancer, cell and developmental biology, cell and molecular pharmacology, neuroscience, physiology, immunology and infectious disease, integrative biology, environmental/exposure science, toxicology, and biomedical engineering. In Newark, an MD/PhD degree program is offered jointly with NJMS, a DMD/PhD degree program is provided jointly with RSDM, and a DPT/PhD program is conducted jointly with the School of Health Related Professions. GSBS in New Brunswick/Piscataway offers seven PhD programs jointly with GSNB as part of a molecular biosciences program. They also offer an MD/PhD program in collaboration with RWJMS and Princeton University.

GSBS master-level training is offered through a master of science (MS) program, master of biomedical sciences (MBS) program, a master's in clinical translational science (MSCTS) program, an MS/MBA degree program offered jointly with Rutgers Business

School, and an MS/MPH degree program offered jointly with the School of Public Health. In Newark, GSBS also awards certificates in biodefense, pharmacological science, and stem cell biology.

In addition, strong community outreach programs exist across GSBS to teach science and research techniques to local high school and community college students; some of these programs have been recognized at the national level. GSBS participates in state and national educational programs for high school and undergraduate students, including the New Jersey Science Olympiad, the national Brain Bee, and the NJ SEEDS program to prepare academically talented, financially limited youth for success at competitive schools.

New Jersey Medical School



New Jersey Medical School (NJMS) is an academic, biomedical research, and health care enterprise whose mission is to meet the needs of the local and global community through outstanding education, pioneering research, cutting-edge clinical care, and public service. NJMS, founded in 1954 and based in Newark, educates students, physicians, and scientists to meet society's current and future health care needs.

NJMS provides undergraduate medical education to 750 medical students, who make up one of the most ethnically diverse student bodies in the U.S. Students are expected to acquire knowledge and understanding of societal needs and demands on health care throughout the four years of training. The six NJMS curricular goals are mastery of clinical knowledge with integration of basic sciences, excellence in clinical skills, excellence in professionalism and humanism, commitment to the health of the community and appreciation of social and cultural diversity, commitment to lifelong learning, and development of effective skills in education and communication. In addition to the MD degree, NJMS offers BA/MD, BS/MD, MD/MBA, MD/PhD, MD/JD, MD/MPH, and MD/OMFS degrees, either with other RBHS schools or with affiliated institutions.

Medical students receive clinical training through rotations available at multiple hospitals, including predominantly underserved and underinsured populations as well as predominantly suburban populations. Hospitals include University Hospital in Newark, NJMS's principal teaching hospital and New Jersey's busiest level 1 trauma center, Veterans Administration New Jersey Healthcare System in East Orange, Hackensack University Medical Center (HUMC), HUMC Mountainside Hospital, Saint Barnabas Medical Center, Morristown Memorial Hospital, Newark Beth Israel Medical Center, and Greystone Park Psychiatric Hospital. NJMS students consistently match at a rate higher than the national average in the National Resident Matching Program and, in recent years, have averaged between 98 and 100%.

The NJMS graduate medical education program encompasses 54 specialty tracks and provides training to 600 house staff (residents and fellows), representing 27 different fellowship and residency programs.

There are 650 full time, 115 part time, and nearly 1,600 volunteer faculty in NJMS basic science and clinical departments. Faculty represent a diverse population, with 39% female and 10% under-represented minorities.

The academic distinction of NJMS clinical programs, together with its world-class physicians, attracts patients to tertiary specialty services, which include otolaryngology, liver transplant, neurosurgery, ophthalmology, orthopedics, trauma, and cardiology. In FY 2014, 311 full-time clinical faculty covered more than 627,000 patient visits through the NJMS faculty practice. NJMS clinical faculty provide services through their academic departments and collaborate in world-class centers and institutes including the Global Tuberculosis Institute, the Institute for Infection and Inflammatory Disease, the Neurological Institute of New Jersey, and the Craniofacial Center of New Jersey.

In FY 2013, NJMS faculty received a total of \$80,500,000 in extramural awards (\$62,600,000 in direct costs and \$17,900,000 in indirect costs). Of this total, \$44,800,000 was received from NIH (\$31,200,000 in direct costs and \$13,600,000 in indirect funding). Areas of research excellence include inflammation and infectious disease, cardiovascular disease, and neuroscience. NJMS faculty conducting research in these fields frequently publish in high-impact journals, and work from these groups has led to the development and commercialization of novel products for clinical use. Researchers' specific interests range from developing new therapies for autoimmune disease, including multiple sclerosis, to the development of state-of-the-art methods to diagnose infectious agents.

NJMS was one of the first medical schools to receive the Association of American Medical Colleges' Outstanding Community Service Award for its diversity-rich programs. This recognition was based on NJMS's longstanding tradition of programs that benefit the local community, such as the Student Family Health Care Center, the oldest student-run clinic of its type in the nation, which offers free, quality health care to the Newark community, provided by volunteer medical students under the supervision of board-certified faculty; Student Health Advocates for Resources and Education, which facilitates student initiatives in service learning through community health and educational outreach programs and provides opportunities for students to engage in direct patient care, community education and youth mentoring under the guidance of faculty advisers; RESPIRA, which educates both parents and children about the development, triggers, and treatment of asthma, and provides each participating child with an individualized asthma action plan; and the Division of Adolescent and Young Adult Medicine, with expertise in all aspects of the health, development, and behavior of adolescents, improving their quality of life.

Working with Newark-based initiatives, NJMS has spearheaded efforts including lead poisoning surveillance, immunization, HIV policy, dropout prevention, teenage pregnancy, violence, and LGBT youth social and environmental issues. New Jersey Poison Information and Education System provides approximately 65,000 consultations annually to New Jersey residents and their clinicians concerning the prevention and treatment of poisonings.

NJMS occupies approximately 1,145,300 gross square feet across six facilities in Newark. Education, research, clinical care, and administrative operations are located in the Medical Science Building, New Jersey Cancer Center, International Center for Public Health and Regional Biocontainment Laboratory, Doctors Office Center, and Behavioral Health Sciences Building, with limited occupancy of the administrative complex buildings. The Medical Science Building was opened in 1976 and the New Jersey Cancer Center in 2009.

Robert Wood Johnson Medical School



Originally founded in 1961 as the two-year Rutgers Medical School, Robert Wood Johnson Medical School (RWJMS) conferred its first medical degrees in June 1974. It now counts nearly 5,400 graduates among its alumni and has 617 full time, 187 part time, and 1,554 volunteer faculty members. During its more than 50 years, RWJMS has maintained a commitment to excellence and innovation that is reflected in its core missions of education, research, patient care, and community health. Today, RWJMS encompasses 20 basic science and clinical departments and nearly a half-dozen major institutes, including the Cardiovascular Institute and the Child Health Institute of New Jersey.

RWJMS and Robert Wood Johnson University Hospital, RWJMS's principal teaching hospital, comprise New Jersey's premier academic medical center. In addition, RWJMS has 34 additional hospital affiliates and ambulatory care sites throughout the region.

Robert Wood Johnson Medical Group is the largest multi-specialty physician faculty practice in New Jersey. In FY 2014, the more than 500 physicians received 791,000 patient visits. The practice has a fully functioning electronic medical record system and is focused on patient safety and the provision of quality clinical programs that deliver optimal outcomes for the community. Signature programs include cardiovascular care, trauma, transplantation, and women's and children's health.

RWJMS's current student population includes more than 560 medical students, 127 students pursuing the doctor of philosophy degree in conjunction with the Graduate School of Biomedical Sciences (GSBS), 40 MD/PhD students in a program also offered jointly with Princeton University, and 47 students combined in the MS in clinical and translational science, MS in biomedical sciences

and MBS degree programs with GSBS, as well as approximately 55 postdoctoral students with GSBS. In addition to these programs, RWJMS offers the following dual-degree programs: MD/MPH, jointly with the School of Public Health; MD/JD, with Rutgers School of Law–Camden; and MD/MBA, in conjunction with Rutgers Business School–Newark and New Brunswick. A PharmD/MD program, considered to be the first of its kind in the nation, is available jointly with the Ernest Mario School of Pharmacy. The school also is responsible for the education of more than 450 residents and fellows in more than 45 accredited graduate medical education programs. The medical school's highly successful performance in the National Resident Matching Program averages between 98 and 100% matches annually. The fully integrated, interprofessional curriculum is system-based and strives to develop clinically proficient, culturally competent, and humanistic physicians.

RWJMS receives extramural support for research from federal and non-federal sources and has achieved national and international recognition. In FY 2013, RWJMS faculty received a total of \$75,487,052 in extramural awards (\$62,291,543 in direct costs and \$13,195,509 in indirect costs). Of this total, \$31,224,306 was received from NIH (\$23,151,684 in direct costs and \$8,072,622 in indirect funding). Substantial strength exists within cancer, child health, neuroscience, and cell biology research programs. Among the significant external grant funders, the Robert Wood Johnson Foundation (RWJF) has supported programs in child health, cardiovascular disease, and cancer.

The medical school's Eric B. Chandler Health Center is one of the few federally qualified health centers to be owned and operated jointly by a medical school and community board. The center strives to eliminate barriers to obtaining quality, family-oriented primary and dental health for its diverse, multicultural population by providing comprehensive acute and chronic care to patients of all ages. The center receives 60,000 patient visits annually at its two locations in downtown New Brunswick and satellite location in New Brunswick High School for students and city residents. Through its numerous outreach and social service activities, the center provides a variety of support services to patients and the community. RWJMS houses the New Brunswick Community Interpreter Project to address the growing need to serve patients who do not speak English as a first language. In addition, RWJMS facilitates student involvement in the greater New Brunswick community through programs such as the Homeless and Indigent Population Health Outreach Project. This initiative, which began in 1992, now involves approximately 300 students and faculty each year.

The RWJMS Office of Global Health offers medical students opportunities to participate in international rotations, providing learning opportunities and the advocacy for medically underserved patient populations.

RWJMS conducts its educational, research, and clinical activities in facilities space totaling more than 1.2 million square feet, including the 221,000 square-foot Clinical Academic Building

in New Brunswick, home to outpatient care, research and service laboratories, academic offices, and support programs; the 125,000 square-foot Research Building in Piscataway, which features 27 scientific labs; and the 166,000 square-foot Child Health Institute of New Jersey.

Rutgers School of Dental Medicine



Rutgers School of Dental Medicine (RSDM), established in 1956, is the state's only dental school. It operates New Jersey's largest oral health care system, accommodating more than

150,000 patient visits annually. Its nine academic departments include Community Health, Endodontics, Oral Biology, Oral and Maxillofacial Surgery (OMFS), Orthodontics, Periodontics, Pediatric Dentistry, Orthodontics, and Restorative Dentistry. More than 250 full- and part-time faculty members hold appointments at RSDM, along with more than 100 volunteer faculty members.

RSDM's mission is to improve oral health and quality of life through the education of oral health professionals and scientists, the conduct of research, the promotion of health and disease prevention, and the delivery of oral health care to communities throughout the state and beyond. The school offers a doctor of dental medicine (DMD) degree as well as numerous postdoctoral programs and has an active continuing dental education program. Over 400 students are enrolled in the four-year DMD program or the 27-month DMD program for qualified dentists trained outside the U.S. or Canada, and more than 100 students are pursuing post-doctoral education. The school offers both a master in dental science (MDS) and master of science in dentistry (MSD). Students can earn postgraduate certificates in endodontics, pediatric dentistry, orthodontics, periodontics, and prosthodontics. Continuing education and fellowship programs are offered in infectious disease, oral medicine, oral and maxillofacial radiology, orthodontics, orofacial pain, and geriatrics (jointly sponsored by the Rowan University School of Osteopathic Medicine). RSDM also hosts general practice and oral surgery residencies. A master's and a PhD in oral biology are jointly offered with the Graduate School of Biomedical Sciences (GSBS). In addition, seven- and eight-year joint-degree programs are offered: DMD/MPH with the School of Public Health, DMD/MS biomedical informatics with the School of Health Related Professions, DMD/MS oral biology and DMD/PhD with GSBS, and OMFS/MD with New Jersey Medical School. The school is the largest provider of care to New Jersey's special needs patient population, who are treated at the Delta Dental of New Jersey Special Care Center at RBHS in Newark. It is also the largest N.J. provider of Medicaid dental services, drawing patients from all 21 counties and surrounding states. Several thousand state residents also benefit from the school's community service activities, including oral cancer screenings, patient education, and programs for Newark school children who are treated at

the Brunsdon-Villa Pediatric Center. In addition to student clinics in Newark, the dental school operates a faculty practice, emergency service, and the University Hospital dental service. The school serves patients with complex medical histories, including infectious diseases, such as hepatitis and HIV/AIDS. RSDM is the largest of only 12 programs nationwide to receive Part F Ryan White Community-Based Dental Partnership Program funding for patients with HIV/AIDS. It also operates a maxillofacial prosthodontics program that develops facial prostheses for patients disfigured by trauma or cancer treatment.

Additional clinical services are provided through the school's statewide network for oral health, which provides services to low-income patients at facilities located in the southern New Jersey communities of Northfield, Galloway Township, and Somerdale, as well as at Matheny Center in Peapack. The network houses the school's community-based dental education program (CODE), a service-learning program for fourth-year students, which is regarded as a national model. In addition, the school has three centers of excellence: the Center for Temporomandibular Disorders and Orofacial Pain; the Ina and Howard Drew Maxillofacial Imaging Center; and the Delta Dental of New Jersey Special Care Center. Faculty also collaborate with University Hospital at the University Craniofacial Center of New Jersey.

Finally, RSDM faculty received a total of \$4,637,922 in extramural awards in FY 2013 (\$3,976,055 in direct costs and \$661,867 in indirect costs). Of this total, \$1,197,027 was received from NIH (\$806,809 in direct costs and \$390,218 in indirect costs). The program emphasizes research involving oral infectious diseases, neurophysiology of pain, and genomics. There are three core centers of research: the Dental Research Center and Center for Oral Infectious Disease, both housed in the Department of Oral Biology, and the Center for Orofacial Pain, housed in the Department of Diagnostic Sciences.

Rutgers School of Nursing



On July 1, 2014, the Rutgers College of Nursing, with programs in Newark and New Brunswick and founded in 1957, merged with the Rutgers School of Nursing with programs in

Newark, established in 1992, to form the new Rutgers School of Nursing (SON). Merger planning took advantage of the significant commonality of the two programs' educational offerings, community clinical service projects, and ongoing research activities. The unified school effectively and efficiently serves the people of New Jersey and contributes to improving health outcomes through the education and training of nurses and services to communities. The nursing school offers a broad array of academic programs, provides leadership and participates in interprofessional training and practice, and contributes significantly to nursing science and patient care research.

The school occupies 103,300 square feet of space in Ackerson Hall (33,400 sq. ft.) and the Stanley S. Bergen Building (60,000 sq. ft.) in Newark, the 110 Paterson Street building in New Brunswick (9,900 sq. ft.), and other smaller locations throughout the state. Options for additional space in New Brunswick are currently under consideration to meet anticipated expansion needs. The organizational structure is based on SON's academic programs, with three divisions: Entry to Baccalaureate Nursing Practice, Advanced Nursing Practice, and Nursing Science. Although the nursing school's 120 full-time faculty teach across programs, each member has an appointment in one of these three divisions.

The school's educational mission is to prepare highly qualified nurses at all levels of higher education to meet the diverse needs of patients, families, and caregivers across the continuum of care. To achieve this, existing curricula were strengthened and merged into a single educational structure. Baccalaureate programs include a four-year bachelor of science (BS) in nursing, an accelerated bachelor of science for those with an undergraduate or higher degree in another field, and an online bachelor of science completion program for registered nurses. Master of science in nursing (MSN) degree programs offer specializations in midwifery, nurse anesthesia, community health, leadership, and informatics. The school also offers doctor of nursing practice (DNP) programs for students with a BS in nursing, designed for those who want to practice as an advanced practice nurse and to use evidence-based research in their practice. DNP specialties include pediatrics, adult health/gerontology in primary care or acute care, family, women's health, psychiatric mental health, and family/emergency care. PhD degree programs are available in nursing science, and in urban health systems, an interdisciplinary program offered jointly with New Jersey Institute of Technology and Rutgers University–Newark. SON anticipates that more than 1,800 students will enroll in these programs in 2014–15: 800 undergraduates, nearly 1,000 MSN and DNP students, and about 100 PhD candidates.

The School of Nursing's research mission is focused on improving urban health, improving quality and outcomes of care, and minimizing cost. The school's research programs contribute to the health and well-being of diverse populations, and foster research initiatives that generate, test, and refine disciplinary knowledge and inform health policy at the local, national, and global levels. Faculty conduct intervention studies designed to reduce health disparities, enhance patient safety and quality outcomes, promote health and comfort, and reduce suffering. Research programs are conducted largely through seven centers: the Center for Community-Based Participatory Research for Community Health, the Center for Patient Safety and Quality, the Center for Urban Youth and Families, the Center for Urban Health, the François Xavier Bagnoud Center (committed to improving the health of vulnerable women, children, youth and families—including those infected/affected by HIV—and building capacity in the communities and systems that serve them), the Northeast Institute for Evidence Synthesis and Translation, and the Workforce Collaborating Center

for Nursing. SON received a total of \$44,812,320 in extramural awards in FY 2013 (\$44,362,462 in direct costs and \$449,859 in indirect costs). (These numbers represent combined awards received by the then College of Nursing and School of Nursing.) No funding was received from NIH. Grants and contracts were received from the federal government (the Health Resources and Services Administration and the Centers for Disease Control and Prevention), State of New Jersey agencies, and foundations.

The service mission focuses on providing clinical services for local communities, service-learning for students, as well as consultation to state government and health care institutions. SON delivers clinical care through the FOCUS Wellness Center, an interprofessional practice model providing primary and behavioral health services in Newark; the New Jersey Children's Health Project mobile van that visits public housing facilities on a weekly basis; the Jordan and Harris Community Health Center, which provides comprehensive, coordinated, primary health care services to over 3,000 public housing residents; an HIV/AIDS primary care clinic in Newark; training for community health workers (promotores) in New Brunswick; and health fairs and other community activities.

School of Health Related Professions



Established in 1976 as the School of Allied Health Professions, the School of Health Related Professions (SHRP) took its current name in 1981. SHRP's mission is to improve the quality

of health care for the people of New Jersey and beyond, through innovative academic programs, applied research and scholarship, and community service. These programs are led by the school's nearly 600 faculty members. SHRP's major focus is education with an emphasis on humanism, an approach to health care that focuses on patient-centered and practitioner/patient relationship-centered care in contrast to case or disease-centered care. It is an interdisciplinary/interprofessional approach to care that places an emphasis on mutual respect and sensitivity to values, autonomy, and cultural and ethnic backgrounds of others. It also places an emphasis on community and population health rather than just the individual, and on prevention as well as treatment.

SHRP graduates are prepared with the knowledge, skills, and intellectual maturity necessary to become progressive, innovative, and interprofessional practitioners and leaders in a dynamic health care environment. SHRP enrolls more than 1,700 students in 41 academic programs, 19 of which are offered at the graduate level and 22 at the undergraduate or certificate level. At the graduate level, there are seven doctoral programs (PhD in biomedical informatics, PhD in health sciences, PhD in psychiatric rehabilitation, doctor of clinical nutrition, doctor of clinical laboratory sciences, and two entry level doctor of physical therapy programs), 10 master of science programs (master of science in biomedical informatics, clinical laboratory science, clinical nutrition, clinical trial sciences, health

sciences, health care management, physician assistant, psychiatric rehabilitation, rehabilitation counseling, and radiologist assistant), and two graduate certificates (dietetic internship and health care informatics). At the undergraduate level there are seven bachelor of science degree programs (health sciences, allied health technologies, clinical laboratory sciences, health information management, medical imaging sciences, nutrition and dietetics, and psychiatric rehabilitation and psychology), five associate degree programs (dental hygiene, psychosocial rehabilitation, respiratory care, respiratory therapy, and occupational therapy assistant), and 10 certificate programs (cardiac sonography, cytotechnology, dental assisting, diagnostic imaging technologies, diagnostic medical sonography, dietary management, medical coding, medical laboratory science, nuclear medicine technology, and vascular sonography).

SHRP enrolls students from every county in New Jersey, 43 states, and countries around the world. SHRP has a rich student body highly diverse in age, ethnicity, race, professional backgrounds, and disabilities. One third of the student population is a member of an underrepresented minority. SHRP is the predominant or only education program in New Jersey for many of the allied health professions. In order to meet the needs of students statewide, programs are offered in Newark, Piscataway, Scotch Plains, and Stratford campuses, as well as online. SHRP has been an institutional leader in leveraging technology to offer an extensive distance education program, expanding educational opportunities for students throughout New Jersey and beyond.

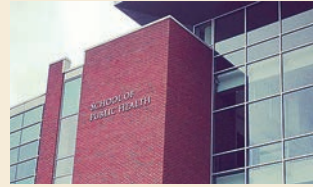
SHRP partners with 37 colleges and universities to offer joint degrees, and more than 600 clinical sites across the country to educate students in certificate, associate, bachelor's, and clinical doctoral degree programs. The model of general education at the partner school, and professional education at SHRP, promotes quality higher education in a cost effective manner. In addition, the SHRP Health Science Careers program partners with 52 New Jersey high schools to provide college-level health sciences courses for college-level credits for approximately 2,500 students each year.

SHRP provides clinical services to underserved populations in the areas of dental health, physical, occupational, and mental health rehabilitation. SHRP manages a large occupational and physical therapy practice that services K–12 public school students in greater Newark. The Integrated Employment Institute successfully improves employment skills and employment of those individuals with psychiatric illness. SHRP allied dental faculty treat patients in Scotch Plains at the SHRP dental hygiene clinic. The LiftUp worksite wellness program provides 12 weeks of nutrition intervention and then follow-up at 26 weeks and two years for Rutgers employees. The program is sponsored by SHRP as part of its support for wellness.

Research strengths exist in complementary and alternative medicine, nutrition and wellness, rehabilitation and movement science, employment and education interventions for persons with serious mental illness, comparative effectiveness, and biomedical

informatics research. SHRP faculty received a total of \$7,039,904 in extramural awards in FY 2013 (\$6,791,885 in direct costs and \$248,019 in indirect costs). Of this total, \$497,374 was received from NIH (\$391,130 in direct costs and \$106,244 in indirect costs).

School of Public Health



The School of Public Health (SPH) has its roots in an accredited graduate program in public health that began in 1983 at the Robert Wood Johnson Medical School (RWJMS) in New Brunswick. Accreditation as a School of Public Health was received in 2001 with new teaching programs added in Newark and Stratford. By spring 2014, the students were distributed 65%, 30%, and 5% among the three locations, respectively. Teaching in Newark is conducted predominantly by faculty from New Jersey Medical School, the Rutgers School of Dental Medicine, and the School of Public Affairs and Administration at Rutgers University–Newark.

The School of Public Health's mission is to improve health and prevent disease in diverse populations in New Jersey and around the world through educating future public health leaders, researchers and practitioners; conducting research to advance public health science and policies; and providing service programs that promote population and individual health.

Ninety-eight faculty members have primary SPH appointments (36 full time, 9 part time, 37 per diem, and 16 assigned to the New Jersey Department of Health), 77 affiliated faculty members have primary appointments elsewhere at Rutgers, and 45 faculty members are voluntary. Departments on the New Brunswick Campus include Biostatistics, Environmental and Occupational Health, Epidemiology, Health Education and Behavioral Science, and Health Systems and Policy. Departments based in Newark are Dental Public Health, Quantitative Methods (Epidemiology and Biostatistics), and Urban Health Administration. Health Systems and Policy is the only concentration available at the Stratford location.

Nine interdisciplinary centers and institutes enable faculty and students to become involved with a diversity of investigators, departments, and schools at Rutgers: Center for Global Public Health, Center for Health Economics and Health Policy, Center for School and Community-Based Research and Education, Center for Tobacco Studies, Community Living Project Education, Institute for the Elimination of Health Disparities, New Jersey Center for Public Health Preparedness, Office of Public Health Practice, and Tobacco Dependence Program (in collaboration with RWJMS and the Rutgers Cancer Institute of New Jersey). Faculty also collaborate with the Institute for Health, Health Care Policy and Aging Research; the Environmental and Occupational Health Sciences Institute; and the Rutgers Cancer Institute of New Jersey.

SPH offers postbaccalaureate certificates and the following academic degrees: master of public health (MPH); master of science in biostatistics (biostatistics and pharmaceutical biostatistics concentrations); master of science in health outcomes, policy, and economics (joint degree with Ernest Mario School of Pharmacy); doctor of public health (DrPH); and PhD in public health. Dual-degree programs include: MD/MPH, DO/MPH, DMD/MPH, MS/MPH, PharmD/MPH, MPH/MBA, JD/MPH, MPH/MSPA (physician assistant), and MPH/MS in biomedical informatics. Articulated degree programs include the BA/MPH and BS/MPH and are offered jointly with Rutgers University–New Brunswick undergraduate schools, Richard Stockton College of New Jersey, and William Paterson University of New Jersey. Total student enrollment is 363 (296 in MPH and MS degree programs, 67 in PhD and DrPH degree programs). Twenty-eight percent of students are members of underrepresented minorities; 70% are women. The school also conducts an extensive program of one- to four-day trainings for hazardous waste workers, workers in the construction trades, and the public health workforce.

SPH research includes programs in biostatistics (cancer, environmental issues, primary care, and methods to improve efficiency of phase 1 and phase 2 trials), epidemiology (health disparities, social epidemiology, maternal and child health, and outcomes research), health policy (health care reform, national medical expenditures, and effect of nurse staffing levels on health outcomes), health education (tobacco issues, implementation of cell phone surveys, hazardous waste worker training), and environmental and occupational health (air pollution). SPH faculty received a total of \$7,801,857 in extramural awards in FY 2013 (\$6,765,624 in direct costs and \$1,036,233 in indirect costs). Of this total, \$2,965,289 was received from NIH (\$2,497,781 in direct costs and \$467,508 in indirect costs).

RBHS Centers and Institutes

Rutgers Cancer Institute of New Jersey



As New Jersey’s only National Cancer Institute (NCI)-designated comprehensive cancer center, the Rutgers Cancer Institute of New Jersey is dedicated to improving the prevention, detection, treatment, and care of patients with cancer through the transformation of laboratory discoveries into clinical practice. The Cancer Institute delivers advanced comprehensive care to adults and children, including access to clinical trials; conducts cutting-edge cancer research; and provides outreach and education regarding cancer prevention, detection, and treatment. Cancer Institute faculty received a total of \$93,812,179 in extramural awards in FY 2013 (\$69,152,111 in direct costs and \$24,660,068 in indirect costs). Of this total, \$74,572,551 was received from NIH (\$53,387,245 in direct costs and \$21,185,306 in indirect costs).

The coveted NCI comprehensive designation, awarded to only 41 such centers nationwide, is granted competitively to institutions characterized by scientific excellence and the ability to bring research discoveries to patients. To gain a “comprehensive” designation, NCI’s highest ranking, a center must meet rigorous criteria in cancer care, research, prevention, and education. NCI-designated centers such as the Cancer Institute are the centerpiece of the nation’s effort to reduce disability and death from cancer and are heralded as providing great value to any state committed enough to obtain and maintain such an institution. An NCI-designated center brings value to a state and its citizens through opportunities, prestige, resources, and funding not otherwise available.

The institute manages more than 100,000 patient visits per year and approximately 250 clinical trials at its 225,000 square-foot facility in New Brunswick and, along with its statewide network of hospitals, cares for more than one-third of New Jersey’s cancer patients. A dedicated team of nationally renowned specialists, including medical oncologists, surgical oncologists, radiation oncologists, social workers, and nurses, identify and meet the needs of the individual patient. An academic physician who is an expert in the cause and treatment of that disease leads each multidisciplinary team.

The Cancer Institute research programs and core facilities enhance and support the cancer research of over 200 members and collaborators from multiple schools at Rutgers University, Princeton University, and the Institute for Advanced Study in Princeton. Current research programs/initiatives include precision medicine, population science, systems biology, oncogenesis, tumor virology and immunology, autophagy, drug development and resistance, the relationship between cellular and genetic alterations and tumor development, cancer control and prevention, bioinformatics, and cancer genomics. Basic scientists, clinical researchers, and population scientists meet regularly to exchange information and ensure that laboratory discoveries are refined and applied to clinical care as quickly as possible, that clinical observations reach laboratory researchers on a continuing basis, and that prevention strategies are interwoven into all research programs.

Educational programs include formal training programs, seminars, and educational events targeted to faculty, postdoctoral and predoctoral fellows, and undergraduate and high school students. The institute offers a residency training program in radiation oncology as well as fellowship training in hematology/oncology and surgical breast cancer. The institute’s oncology nursing education program provides a wide variety of continuing education program for cancer nurses throughout New Jersey. In addition, the Cancer Institute hosts two educational forums annually: the Annual Retreat on Cancer Research, which attracts scientists throughout New Jersey, and the Governor’s Conference on Effective Partnering in Cancer Research, which attracts an international audience of cancer research leaders.

Center for Advanced Biotechnology and Medicine



The Center for Advanced Biotechnology and Medicine (CABM) was founded in 1985 and designated by the New Jersey Commission on Science and Technology as a New Jersey

Advanced Technology Center. CABM is located on the Busch Campus in Piscataway in a 100,000 square-foot building completed in 1990. Its mission is to make fundamental discoveries in biomedical research, develop new technologies, and translate these to improve human health.

CABM has 14 faculty members who hold academic appointments in departments within the Robert Wood Johnson Medical School, the School of Arts and Sciences, and the Ernest Mario School of Pharmacy. Many CABM faculty members are also members of the Rutgers Cancer Institute of New Jersey and non-resident members of the Rutgers Center for Integrative Proteomics Research. Several CABM faculty members also hold administrative leadership positions.

Interdisciplinary research at CABM is aimed at discovery and characterization of potential therapeutic targets with projects focused in the areas of infectious disease, neurodevelopmental/neurodegenerative disorders, and cancer. Infectious disease programs advance development of new drugs to combat drug-resistance in HIV, and characterize new targets for hepatitis C drugs, anti-influenza therapeutics, and antibiotics effective against drug-resistant pathogenic bacteria. Programs in neurodevelopment and neurodegeneration focus on a newly discovered autism susceptibility gene and an enzyme replacement treatment for Batten disease, a fatal hereditary childhood neurodegenerative disorder. It also examines key steps in retinal development and mechanisms of regulation of circadian clocks. Cancer programs focus on regulatory mechanisms and metastasis in breast cancer, combination therapies for lymphoma, and structural characterization of novel therapeutic targets identified in networks of proteins associated with cancer. Advanced technologies are central to these projects. CABM faculty established and direct core facilities and share equipment including a biological mass spectrometry facility, an X-ray crystallography laboratory, an NMR Laboratory, and a protein production and structural proteomics core. Many projects are conducted collaboratively between CABM investigators and with investigators throughout Rutgers. CABM faculty received a total of \$15,417,732 in extramural awards in FY 2013 (\$11,563,526 in direct costs and \$3,854,206 in indirect costs). Of this total, \$14,355,215 was received from NIH (\$10,640,109 in direct costs and \$3,715,106 in indirect costs).

CABM faculty members are active in classroom and laboratory teaching. Trainees include undergraduate and graduate students from many different programs, medical students, postdoctoral fellows, and visiting faculty scholars. The National Institute of General Medical Sciences-funded Biotechnology Training Program

for PhD students, co-established and co-directed with the Rutgers School of Engineering's Department of Biomedical Engineering, is now in its 23rd year of support and is Rutgers' longest running NIH training program. CABM also hosts a summer undergraduate research experience and a summer program for students from Jiangnan University, China.

CABM initiatives with biotechnology and pharmaceutical industry partners are central to its mission. CABM has spawned two biotechnology companies. Prodaptics Pharmaceuticals, Inc., established in 2011, pursues therapies targeting flu virus. Nexomics Biosciences, established in 2008, uses licensed technologies developed at CABM for protein production and structure determination to enable drug discovery and development by client biotechnology and pharmaceutical companies. Other collaborations include partnerships with BioMarin Pharmaceuticals to develop a therapy to treat Batten disease, and with Avatar Biotechnologies LLC, Gilead Sciences, GlaxoSmithKline, and Novartis to develop vaccines and therapies against the hepatitis C virus.

Environmental and Occupational Health Sciences Institute



The Environmental and Occupational Health Sciences Institute (EOHSI) was established in 1986 in response to the serious environmental and occupational issues facing residents of New

Jersey and the nation. EOHSI's major objectives are to advance the understanding of mechanisms by which environmental and occupational chemical exposures impact human health; identify and measure human environmental and occupational chemical exposure; treat patients adversely affected by chemical exposures; develop educational tools describing the health risks of chemical exposures; contribute to public policies related to environmental and occupational chemical risks; and offer graduate educational programs for training the next generation of environmental health professionals. EOHSI's 78,000 square-foot building on the Busch Campus houses research laboratories for 22 resident scientists. EOHSI faculty received a total of \$14,159,101 in extramural awards in FY 2013 (\$11,284,665 in direct costs and \$2,874,436 in indirect costs). Of this total, \$9,046,652 was received from NIH (\$7,468,209 in direct costs and \$1,578,443 in indirect costs).

EOHSI is an international resource that supports basic science, clinical, and translational research in environmental health sciences, occupational medicine, exposure assessment, and toxicology. The institute also fosters numerous programs in environmental health education, public policy, and graduate education. Members serve as sources of expertise to help solve environmental problems for communities, employers, and government agencies in all areas of occupational and environmental health. The institute's members serve as advisers to international, national, state, and local organizations on issues concerning environmental exposures and human health.

EOHSI is home to several research divisions, centers, and core facilities. EOHSI's four main divisions are: Clinical Research and Occupational Medicine, Environmental Epidemiology and Statistics, Exposure Science, and Toxicology. Its long-term multidisciplinary centers serve to foster collaborative research within RBHS and across all of Rutgers: the National Institute of Environmental Health Sciences (NIEHS) Center for Environmental Exposures and Disease (CEED), the EOHSI Clinical Center, the Counter ACT Research Center of Excellence, the Ozone Research Center, the Center for Exposure and Risk Modeling, and the Federal Aviation Administration Center of Excellence. Its core laboratory facilities include: the Biomimics Research and Technology Center, the Chemical Analytical Core Laboratory, the Controlled Exposure Facilities Core Laboratory, the Computational Chemodynamics Core Laboratory, and the Analytical Cytometry/Image Analysis Shared Resource Core.

EOHSI supports three graduate education programs. The joint graduate program in toxicology, administered by the pharmacy school and RWJMS, provides advanced training in mechanistic toxicology, offering research tracks in molecular toxicology, biochemical toxicology, neurotoxicology, and environmental toxicology. MS and PhD degrees are offered by both GSNB and GSBS. The program has been supported continuously by an NIEHS training grant for more than 25 years.

The graduate program in exposure science offers a doctoral degree specific to the human aspects of environmental science. In 2011, it received the first training grant in exposure science to be awarded by the NIEHS. The residency training program in environmental and occupational medicine focuses on the recognition and prevention of adverse health conditions associated with patient exposures encountered in home, community, and workplace environments. Residents evaluate patients in EOHSI's on-site clinical center. The residency program leads to board eligibility in environmental and occupational medicine.

EOHSI's clinical center is designed to meet the environmental and occupational health needs of New Jersey's workforce. It also serves as the employee health center for RWJMS. The clinical center employs occupational physicians, nurses, psychologists, social workers, and industrial hygienists. In 2012, the EOHSI clinical center accommodated approximately 6,500 clinical visits, including approximately 500 research subjects and over 4,500 employee health visits. Additionally, the clinical center's World Trade Center (WTC) Medical Monitoring and Treatment Program, funded by the National Institute for Occupational Safety and Health, provided ongoing monitoring examinations to 784 WTC responders in the treatment program.

EOHSI collaborates extensively throughout the university and the state of New Jersey, as well as nationally and internationally. EOHSI has established ongoing interdisciplinary collaborative research projects with multiple investigators from the School of Environmental and Biological Sciences, the School of Public

Health, the Ernest Mario School of Pharmacy, and RWJMS. EOHSI's research partners also include agencies of local and federal government, including the New Jersey Department of Health and Senior Services, the New Jersey Department of Environmental Protection, NIH, the U.S. Environmental Protection Agency, and various research foundations.

The institute's major accomplishments include unraveling the mechanistic understanding of how a variety of chemical toxicants behave in the real world. This understanding has allowed EOHSI to provide pivotal input into the development of local and national environmental regulations and policies.

Institute for Health, Health Care Policy and Aging Research



Established in 1985 by founding director David Mechanic, one of the world's most eminent medical sociologists, the Institute for Health, Health Care Policy and Aging Research facilitates

excellence in health research with collaborations among the social and behavioral sciences, clinical disciplines, basic sciences, and related fields to promote studies on critical health and mental health issues. The institute brings together scholars across and beyond Rutgers into a vibrant interdisciplinary network that advances high-quality research in five core areas: behavioral health, health economics, social aspects of health and illness, state health policy, and health services research. The institute's 38 core faculty and 18 associate members have generated award-winning scholarship with coveted fellowships from the Guggenheim Foundation, Russell Sage Foundation, Center for Advanced Study in the Behavioral Sciences, and National Endowment for the Humanities. Six faculty members have been elected to the Institute of Medicine of the National Academy of Sciences. In 2013 associate member and historian Julie Livingston and affiliated researcher and physician Jeffrey Brenner won MacArthur Fellowships for their work in public health and health care.

The institute's new 57,000 square-foot, state-of-the-art, custom-designed academic and research building with clinical/behavioral research space, located in downtown New Brunswick, houses its three related divisions: Division on Health, Division on Health Policy, and Division on Aging. Several notable research centers exist within the institute, including the Center for State Health Policy; the Center for the Study of Health Beliefs and Behavior; the Center for Health Services Research on Pharmacotherapy, Chronic Disease Management and Outcomes; and the Center for Behavioral Health Services and Criminal Justice Research, whose offices are located on the Douglass Campus. Faculty members hold research and training grants funded by the NIH, Agency for Healthcare Research and Quality, Center for Medicare and Medicaid Innovation, National Science Foundation, Robert Wood Johnson Foundation (RWJF), Nicholson Foundation, and other

major funding organizations. Institute faculty received a total of \$12,570,423 in extramural awards in FY 2013 (\$10,535,809 in direct costs and \$2,034,614 in indirect costs). Of this total, \$2,175,660 was received from NIH (\$1,617,967 in direct costs and \$557,693 in indirect costs). Beginning in January 2015, the institute will be the home of the *Journal of Gerontology: Social Sciences*, a leading journal in health and aging.

While the principal mission of the Institute for Health, Health Care Policy and Aging Research is conducting research, faculty also are actively involved in developing future scholars through education and training programs and mentoring for postdoctoral trainees and graduate and undergraduate students. In academic year 2013–14, faculty provided training to six postdoctoral trainees, 102 graduate students were involved in research projects and/or mentored by faculty, and 105 undergraduates were involved in research projects and/or mentored by faculty. Major educational programs include Project L/EARN, an intensive summer research training internship for undergraduates from groups underrepresented in graduate schools and health research careers. Institute faculty members have led a National Institute of Mental Health-funded postdoctoral training program in mental health services research for 35 years. Faculty serve as mentors and advisers to postdoctoral trainees, doctoral students, and undergraduates involved in health research and teach department-based courses in health, including a health and society program in the School of Arts and Sciences (SAS) Department of Sociology that is available as a minor to undergraduates. Several RBHS and SAS faculty members have been involved in establishing an interdisciplinary major that combines the medical humanities/women and health/health and society in SAS. A national program office of RWJF, the New Jersey Health Initiatives Program, located at Rutgers University–Camden, funds a wide range of innovative community-based service implementation projects throughout New Jersey.

RBHS Behavioral Health Care Network

University Behavioral Health Care



University Behavioral Health Care (UBHC), established in 1971, offers a full continuum of academic-based, behavioral health and addiction services for children, adolescents, adults, and

seniors throughout New Jersey. UBHC's 1,139 behavioral health professionals and support staff are dedicated to excellence and committed to being a leader in the delivery of effective, compassionate, and accessible care that is enhanced by research.

UBHC, one of the largest providers of behavioral health care in the country, operates with a \$241 million budget and 15 sites throughout New Jersey, with primary locations in Piscataway and Newark. Services are readily accessible and include: inpatient, outpatient, partial hospitalization, screening, crisis stabilization, family/caregiver

support, community outreach and case management, supportive housing, supported employment, prevention and consultation, employee assistance programs, and a licensed therapeutic school from preschool through high school. Specialty services include the New Jersey suicide prevention helpline and peer helplines for police, veterans, active military, teachers, and mothers of special needs children. In FY 2013, UBHC treated 12,309 patients and touched the lives of tens of thousands through peer support, training, and educational initiatives. UBHC is the primary mental health training resource for the New Jersey Departments of Human Services, Children and Families, and Corrections.

In 2005, UBHC established University Correctional Health Care (UCHC). Through intrastate agency agreements, UCHC's 400 mental health professionals provide mental health- and sex offender-specific treatment services to the inmates, residents, and parolees of the New Jersey Department of Corrections (NJDOC), the Juvenile Justice Commission (JJC), and the State Parole Board (SPB). In October 2008, 650 additional health care staff joined UCHC as UCHC assumed responsibility for all medical and dental services provided to the NJDOC inmate population. In January 2011, another 50 health care staff joined UCHC as it assumed responsibility for all medical services provided to the JJC resident population. These 1,100 employees, included in the total of UBHC staff identified above, provide services for 23,000 inmates in 13 adult correctional facilities, 500 residents in the 15 JJC locations, and 800 individuals in the 10 State Parole Board offices. UCHC has a budget of \$157 million, included in the UBHC budget total above, and has achieved national recognition as a model for the advancement of physical and mental health services delivery within a criminal justice system.

UBHC provides training to medical students, residents, fellows, social work students, and psychology interns. Annually, UBHC supports the education of 19 psychiatric residents and fellows, including two forensic fellows; 13 psychology interns, including four forensic placements, all sponsored by American Psychological Association-accredited programs; and 10 social work interns.

UBHC received a total of \$856,670 in extramural awards in FY 2013 (\$671,821 in direct costs and \$184,849 in indirect costs). Of this total, \$535,069 was received from NIH (\$374,042 in direct costs and \$161,027 in indirect costs). These figures do not include funding received for clinical services from external sources.

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