

Signature Programs

Infection and Inflammation

Infectious and inflammatory disease is one of the leading NIH-funded areas of research excellence at Rutgers, which ranks well among other members of the Committee for Institutional Cooperation (CIC) and institutions of national recognition. The newly established Institute for Infectious and Inflammatory Disease (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 technologic 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 in infectious and inflammatory disease and also when expressed relative to all publications from 2008 through April, 2014, for each institution. Further, nearly 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 to support research and other work in this area. 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 disease 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 of research. As such, the foundation needed to further promote and develop this established area of research excellence at Rutgers already exists. 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.

The following initiatives are planned:

- increasing the number of outstanding faculty,
- encouraging and rewarding interdisciplinary and interprofessional collaboration, and
- developing state-of-the-art resources.

Recruiting new faculty will 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: multiple 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 where different groups can share their ongoing findings and develop novel ideas;
- work closely with the Office of Technology and Innovation to generate IP portfolios specific for the signature area 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-three years);
- upgrade/maintain equipment in existing core facilities, specifically the flow cytometry core at NJMS and a new satellite flow core facility in Piscataway/New Brunswick (three years);
- upgrade the animal facilities at the New Brunswick and Newark campuses (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 Foundation (one year).

A combination of internal and external funding sources will be needed to support these initiatives and make Rutgers one of the top institutions nationwide in this rapidly growing area of research excellence. In order to ensure the successful implementation of the proposed initiatives, the signature area strategic team will continue to 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 signature area 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 leaders of each of these complementary areas to develop an action plan tailored to the needs and strengths of this signature area is already underway.

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, the expectation is that grant funding will continue to rise and could 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 on a yearly basis. 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

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property growth, patent applications, and licenses, revenue will be assessed on a quarterly basis with assistance from the Office of Technology and Innovation.