The mission of Columbia University Medical Center’s Clinical and Translational Science Award (CTSA) is to transform the culture of research to hasten the discovery and implementation of new treatments and prevention strategies. Our core objective is to move the CUMC (Columbia University Medical Center) research community to a more multi- and interdisciplinary scientific mindset by removing barriers and creating incentives for interactions among investigators from different disciplines. CUMC’s first step towards reaching this goal was the establishment of the Irving Institute for Clinical and Translational Research—the academic home for clinical and translational research at Columbia. Irving Institute faculty include some of CUMC’s most accomplished, senior researchers who provide leadership and serve as mentors for junior faculty, fellows, and trainees. Specially-appointed junior faculty, the “CTSA Fellows,” work with senior faculty to develop novel approaches to advancing multi- and interdisciplinary clinical and translational research. The resources provided by the Irving Institute offer support in biomedical informatics, study design and biostatistics, bioethics, regulatory issues, core laboratory facilities, community engagement, plus a fully-staffed Clinical Research Resource for campus investigators.

The Irving Institute’s headquarters occupies the entire 10th floor of two connected buildings, the Presbyterian Hospital and the Harkness Pavilion. The total space occupied is approximately 25,000 square feet. The administrative suite occupies 1,200 square feet at the center of the overall space. Immediately adjacent are both the Adult Outpatient Unit (2,450 s.f.) and the Adult Inpatient Unit (6,000 s.f.). Across the hall are 690 square feet of space dedicated to a Bionutrition Unit. In June 2010, we finalized the construction of a 2,200-s.f., state-of-the-art educational center on PH-10-Stem. Finally, a 400-square-foot conference room and 5,000 s.f. of laboratory and office space used for the Biomarkers Core round out our attractive research location.

The Irving Institute is comprised of nine (9) key functions, or ‘Resources,’ that are available to the CUMC research community:

- **Development of Novel Clinical and Translational Methodologies Resource (DNMR).** The hub for junior and senior clinical/translational (C/T) investigators who strive to develop novel approaches—both technological and conceptual—to advance multi- and interdisciplinary research. DNMR cultivates and supports multidisciplinary groups who are studying important health problems such as obesity and cardiovascular disease. It also helps develop mentoring programs, interdisciplinary seminar series, multidisciplinary training programs, and has supported a didactic program to assist junior investigators as they write their first career R01 grants.

- **Pilot and Collaborative Studies Resource (PCSR).** Provides funds for C/T research initiatives, including pilot awards to junior investigators, and the grants in support of both C/T research and C/T methodology. PCSR has administered a joint pilot award program with CUMC’s Clinical Trials Office whereby sixteen $50,000 grants are awarded each year. Recently, the program has cultivated partnerships with the various departments on campus who provide ‘matching funds’ to these promising researchers. The CaMPR (Collaborative and Multidisciplinary Pilot Research) awards program has stimulated senior and junior faculty to join together in creating new and novel teams to tackle research questions that require a multidisciplinary approach. Four $15,000 Phase I planning grants are awarded each year. Of these four planning grants, a second competition is conducted whereby one final Phase II grant is selected for an additional $75,000.
Irving Institute for Clinical and Translational Research
Columbia University
September 2012

- **Biomedical Informatics Resource (BMIR).** The vehicle that brings informatics technology to the mainstream C/T community, BMIR helps to integrate existing informatics resources across campus and within the Irving Institute. A major project of this group is the building of a social ‘profile’ network, **CUSP (Columbia University Scientific Profiles)**, which fosters collaborations and brings together investigators from different disciplines utilizing a simple Web search and enables ‘visual’ searching capacity using our newly-developed **Sciologer** social networking tool.

- **Design and Biostatistics Resource (DBR).** Brings together outstanding investigators from biostatistics and epidemiology who work together to assist with C/T research study design and statistical advice. In the first grant cycle of the CTSA, DBR has provide more than 850 consults to since its inception. Up to five hours of statistical consultation are free to Columbia’s research community, and many long-term collaborations have arisen from these consultations.

- **Regulatory Knowledge and Support/Clinical Research Ethics Resource (RKSER).** Unifies existing but isolated groups at CUMC to enhance regulatory education, compliance, and ethics. RKSER works closely with the Clinical Trials Office, the Office of Technology Ventures, and the IRB to provide investigators with assistance in moving the research process forward. The Ethics Resource offers a seminar series on topics of ethics and research and also provides consultations.

- **Clinical Research Resource (CRR).** Builds upon the former General Clinical Research Center (GCRC) structure with adult and pediatric inpatient and outpatient units, highly-trained research nurses, phlebotomy services and facilities. In addition, we have extended “outside the walls” of the GCRC by providing support for research in other areas of CUMC (NICU, PICU, EDs and ERs) as well as through our affiliation with St. Luke’s Roosevelt Hospital Center. The CRR is the major provider of resources for the actual conduct of patient-oriented research on campus. Over 100 CUMC research faculty utilize our inpatient and outpatient resources each year.

- **Community Engagement Resource Core (CECR).** Organizes and guides many groups involved in community-based research. The Irving Institute built an offsite community center, just 10 blocks north of the medical campus, where C/T investigators, community groups, and research participants meet to exchange ideas and expertise, recruit research participants, and conduct observational studies. Just steps away from the George Washington Bridge and public transportation, in the midst of our neighborhood, the CECR provides a connection to community-based organizations and participants in comparative effectiveness research.

- **Translational Technologies and Resources (TTR).** TTR supports core technologies on CUMC. Investigators are provided with pilot funds for services in imaging and biomarkers. Cores include a Biomarkers Laboratory offering a wide-range of tests, four Cancer Center Cores (confocal microscopy, cell sorting, proteomics, genomics), the Research Pharmacy, and the Collaborative Center for Organic Synthesis.

- **TRANSFORM (TRaining And Nurturing Scientists FOr Research that is Multidisciplinary).** The Irving Institute’s educational resource administers the interdisciplinary master’s, predoctoral, and career development programs. By nurturing and training the next generation of translational and clinical researchers to effectively work on interdisciplinary teams, TRANSFORM activities help to change and improve the culture of research on CUMC and speed the process of research and discovery for the improvement of public health.
TRANSFORM offers an integrated educational program that includes a multidisciplinary patient-oriented research master’s degree for fellows and junior faculty, a multidisciplinary, mentored K12 research program for junior faculty, a pioneering cross-over T32 training program for predoctoral students in basic and population sciences, and shorter-term training for novice investigators. These programs are open to faculty, postdoctoral fellows, and graduate students in all schools on CUMC. The master’s degree program in Patient Oriented Research is administratively supervised by the Department of Biostatistics in the Mailman School of Public Health. It is a 30-credit program designed specifically for the CTSA, covering study design and analysis and offering a wide-range of elective courses. A key requirement in the MS/POR program is the completion of an independent grant application, usually in R01- or K23-format, submitted as a master’s thesis. The T32 program for predocs provides support towards a program in Epidemiology, which allows students, while they continue their doctoral projects, to take courses and interact with mentors “across the street.” For example, if a graduate student in physiology is studying the molecular and cellular basis of heart failure, he/she can take courses in the biostatistics and epidemiology as well as joining, for the year, clinical investigators in the heart failure program. The K12 program provides support for Assistant Professors who are conducting multidisciplinary research; they receive significant salary support as well as some support for their research. Many K12 Scholars are also candidates in the master’s program; all are required to submit an application for independent funding within 1-2 years of joining the program.

The Irving Institute offers a new, short-term training opportunity, Reach for the R01 award, available twice a year to Columbia’s most promising junior faculty. Department chairs may nominate junior faculty (up to 1 per cycle) for CTSA training in the submission of their first R01 application. CTSA accepts 4-6 of these each term, across all departments. Selectees receive five free hours of biostatistical consulting, access to other CTSA Resources, two expert pre-reviews on an early draft of the R01 application, and a rigorous bimonthly meeting to ensure structure and timeliness in completing the tasks required to successfully submit a first application. These resources are intended to enhance, rather than replace, appropriate mentoring. An applicant without excellent mentoring cannot be considered competitive for this award process. To be eligible, the candidate must be an Early Stage investigator by the NIH definition. S/he must also be judged by their department chair and two referees to have excellent potential to submit a successful R01 application and engage in a successful career in biomedical research.

In addition to activities directly related to the CTSA, the Irving Institute offers approximately four Irving Assistant Professorships each year. These awards provide $60,000 in undesignated funds for three years to the most promising Assistant Professors at the Columbia’s College of Physicians and Surgeons. We have awarded approximately $15 million to our faculty since 1987.

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