Translational Medicine From Discovery to Health

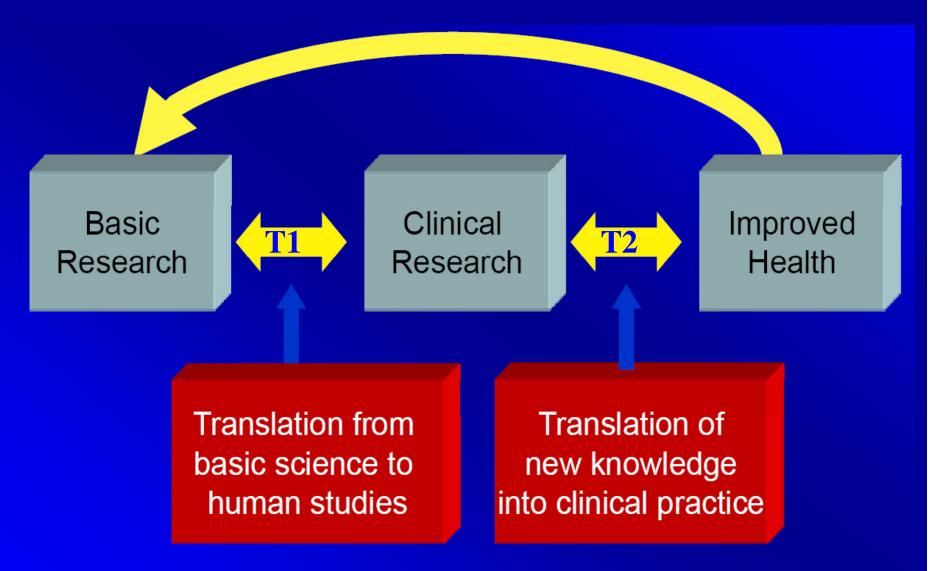
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Translational Medicine

Translational Medicine describes the steps between a fundamental discovery and its application in clinical medicine, from bench to bedside to the practice in community and vice versa

Translational Medicine



Adapted from Sung et al. (2003) JAMA, 289, 1278-89.

Accelerating Research from Discovery to Improved Health

science education



community engagement



animal model resources

Community

research capacity & training



clinical research support

Improved patient care

Clinical



imaging & informatics advances

The Current Buzz-Word Interest From All Corners

• Google Search (3/5/2010)

- Translational Medicine 1,840,000 results

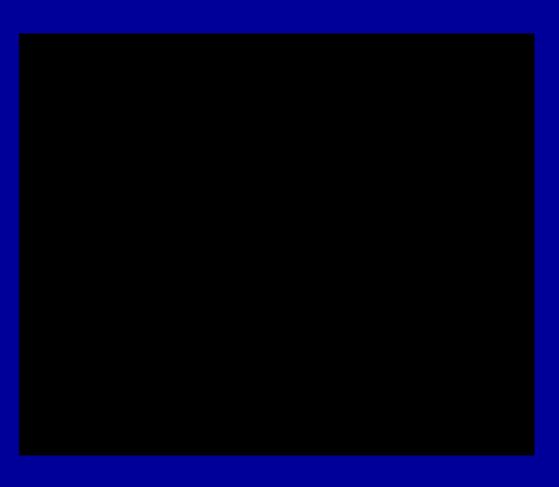
- Translational Research 2,020,000 results

• YouTube Search (3/5/2010)

- Translational Medicine 140 videos

- Translational Research 260 videos

Translational Medicine A Catch Phrase

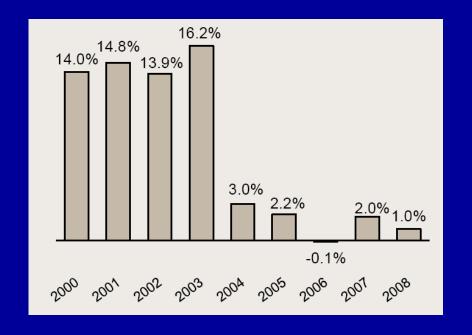


Stake Holders Motivations "Pursuing The Greater Vision"

- All stake holders seek recognition and prestige
- Universities: Foster pipeline for innovation
- Hospitals: Provide patients with cutting edge treatments and clinical trials
- Industry: Bridging "valley of death" between life sciences discoveries and drug/device development
- Funding agencies/NIH: Cost effective funding with speedy translation to patient benefits

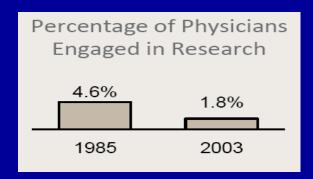
Why Translational Medicine?

- Evolving public health challenges
- Slow speed of translating discoveries
- Changing funding environment



Challenges To Translational Medicine

 Shortage of Translational Researchers



- Academic culture favors individual research contributions
- Silos

Two Different Worlds of Research

"Departments used to contain a mixture of pure physicians, physician-scientists, and even a few basic scientists, all united in their quest to understand and treat human disease. Now, these departments are split. An enormous gap separates those who practice medicine from those who practice science."

Michael Brown

Recipient, Nobel Prize for Medicine

Challenges To Translational Medicine

- Underdeveloped Translational infrastructure
 - Space design and management
 - Integration of research resources and cores
 - Regulatory and ethics support
 - Bioinformatics support
 - Community engagement support
 - Technology transfer support
 - Data and tissue repositories (Biobank)

Transformative National Movement In Translational Medicine

- Academic medical centers: Institutes and centers for translational medicine
- Universities: Clinical and translational science educational programs
- NIH: Road map initiatives for a more efficient and translational biomedical research including establishing a national consortium in clinical and translational research

Institutional Clinical and Translational Science Award RFA

The goal of the Institutional CTSA program is to transform the local, regional and national environment for clinical and translational science, thereby increasing the efficiency and speed of clinical and translational research. This transformation will be achieved by creating an academic home, which can be a center, department, or Institute, comprising faculty and programs that integrate clinical and translational science across multiple departments, schools, clinical and research institutes and hospitals. The C/D/I is expected to include faculty able to conduct original research, develop graduate and postgraduate training curricula and lead programs that integrate clinical and translational science across multiple departments, schools, clinical and research institutes and hospitals.

Clinical and Translational Science Awards

- Eliminate institutional barriers
- Enhance team science across disciplines
- Design state-of-the-art informatics tools
- Improve training and mentoring
- Build new partnerships with private and public health care organizations

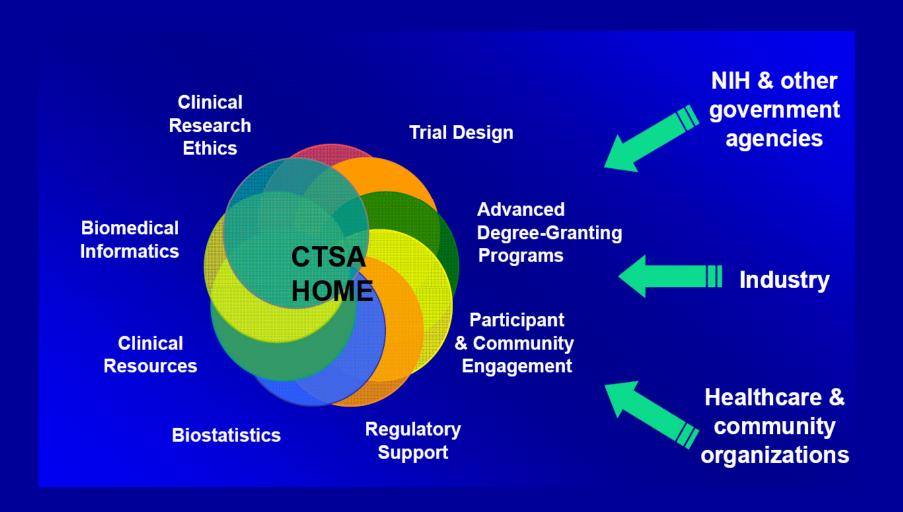






CTSAWeb.org

Clinical & Translational Science Award



 12 Academic Health Centers (AHCs) nationwide

 52 AHC planning grants to prepare applications to join consortium

 In 2012, ~60 institutions will be linked to energize clinical and translational science



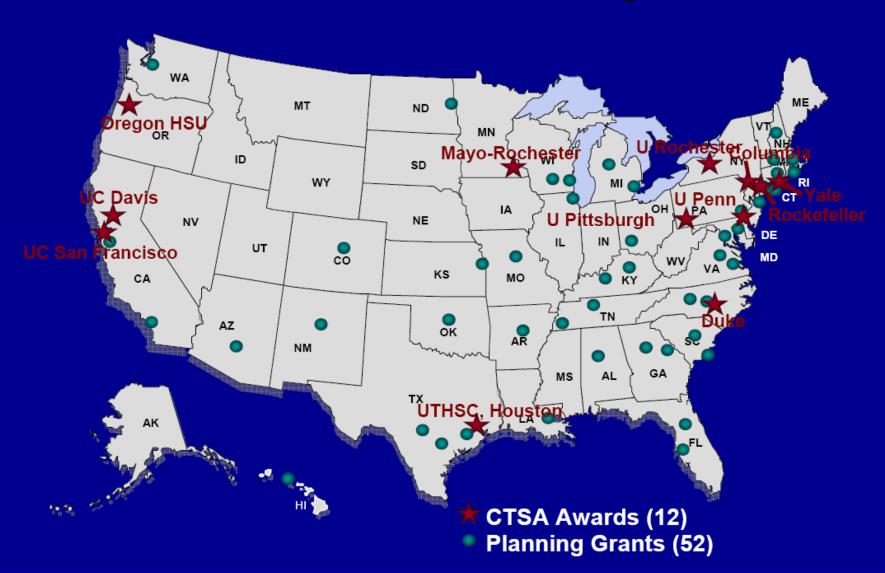


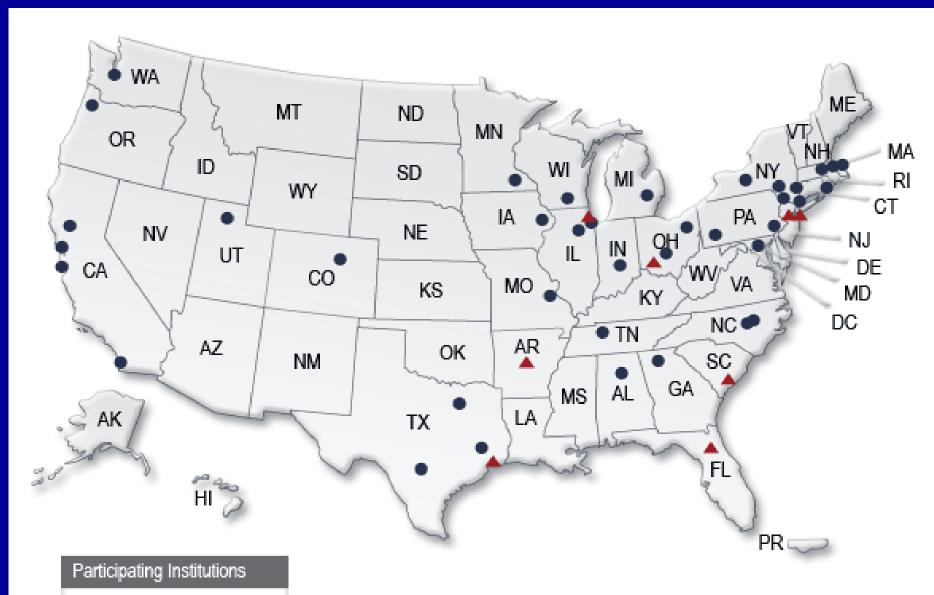
NIH Funds a Dozen 'Homes' for Translational Research



U.S. funds creation of national health research network

Building A National CTSA Consortium FY 2006 CTSA Awards & Planning Grants





- ▲ New Members 2009
- Members

MU And Translational Medicine

Capacity For Concept To Completion

- Academic and heath affairs on the same campus
- Excellence in life sciences research
- Strong collaborative academic culture
- Rich culture of service to the community
- A national leader in medical education

Unique Preclinical Resources

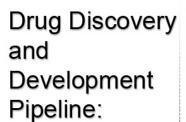
- Largest academic research reactor in the world
- The only NIH funded national swine resource and research center in the nation
- The second largest research animal diagnostic laboratory (RADIL) in the country
- One of 3 mutant mouse regional resource centers
- One of 12 NCI cancer nanotechnology platforms
- One of 12 sites in the NCI Comparative Oncology Trials Consortium

MU Translational Programs

- Radiopharmaceuticals: FDA-approved cancer therapies including Therasphere® and Quadramet®
- Comparative medicine
- Cardiovascular & microcirculation
- Phytomedicine
- Nanomedicine
- Reproductive biology

MU Institute for Clinical and Translational Science

The vision is to take advantage of MU educational and research assets to create an environment that advances health care through interactions among basic scientists, clinical investigators, patients, community physicians, industry, and other partners to make a meaningful impact on the quality-of-life and the health of the citizens of Missouri, the nation, and the world



Strategic **Partnerships**

Discovery

Research Reactor

Radiopharmaceutical Science

Life Sciences Center

Bioengineering

Food 21st Century

Animal Sciences

Physics

Chemistry Nanotechnology

Drug metabolism Pharmocokinetics Pharmocodynamics

Custom synthesis (API)

Radio-label synthesis

Stable-label synthesis

Clinical trials materials

Analytical method development and validation Impurity/metabolite ID and characterization Analytical support forumlation/reformulation Raw materials component testing/COAs Reference standard qualification Stability/forced degradation

Extractables/leachables programs

Laboratories

Scientific and regulatory program

Batch release testing Stability programs Bioequivalency testing De- and re-formulation Radio-labeling synthesis Reference standard synthesis



Preclinical

Phases I-III

Post-Commercialization









Animal trials In-vitro/In-vivo DMPK Toxicology Toxicokinetics Pre-tox screening Animal resource centers



Tertiary care hospitals (2) and clinics Ellis Fischel Cancer Center Clinical Research Unit Clinical Trials Offices (3) **Biostatistics** Investigational pharmacy Practice-based Research Network Institutional Review Board

Data and safety monitoring





Technology transfer Missouri Innovation Center Life Science Incubator Center for Innovation and Entrepreneurship Centennial Investors



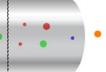














Thank You!