Health Sciences Strategy Task Force

Town Hall Meeting 2.12.2018

Neal J. Cohen
Chair, Health Sciences Strategy Task Force (HSSTF)
Director, Interdisciplinary Health Sciences Institute (IHSI)
Town Hall Roadmap

- Campus-wide Strategic Planning & the Role of the Health Sciences
- Why Health?
- Task Force Process and Answering 5 Charge Questions
- Impact Areas and Cross-cutting Threads
- Health Sciences: Research, Education, and Engagement
- Vision for the Health Sciences Ecosystem at Illinois
Role in the Campus-wide Strategic Plan

• Illinois is currently creating its Strategic Plan for the Next 150 years

• 9 Task Forces: Strategic Focus Areas
  • Data Sciences
  • Diversity
  • Food Security
  • Health Sciences
  • Globalization
  • Emerging Areas in the Humanities
  • Arts, Culture, and Society
  • Public Engagement
  • Social and Behavioral Science
Why Health?

- Health transcends all boundaries – it is incredibly impactful to all people, in all communities across the globe, in countless ways
  - *Globalization, Diversity*

- As a land-grant institution, i.e., a public-serving university, health is a powerful vehicle for reaching our communities with extraordinary, life-changing impact
  - *Public Engagement*
Why Health?

Transcending campus boundaries, uniting disciplines and scholarship

• Illinois has unique ability to view the world through a variety of interdisciplinary prisms and to work collaboratively

• Illinois’ commitment to health and well-being transcends any one department, college, or unit
Membership of Task Force

- Neal J. Cohen, Psychology, IHSI Director, Chair
- Reginald J. Alston, Kinesiology and Community Health
- Stephen A. Boppart, Electrical and Computer Engineering
- Martin D. Burke, Chemistry
- Roy H. Campbell, Computer Science
- Sharon M. Donovan, Food Science and Human Nutrition
- John W. Erdman, Jr., Food Science and Human Nutrition
- Timothy M. Fan, Veterinary Clinical Medicine
- Barbara H. Fiese, Human Development and Family Studies
- Martha L. Gillette, Cell and Development Biology
- Craig G. Gundersen, Agricultural and Consumer Economics
- Wendy Heller, Psychology
- Thenkurussi (Kesh) Kesavadas, Industrial and Enterprise Systems Engineering
- King C. Li, Carle Illinois College of Medicine
- Brent W. Roberts, Psychology
- Susan L. Schantz, Comparative Biology
- James M. Slauch, Microbiology
- Brad P. Sutton, Bioengineering
- Derek E. Wildman, Molecular and Integrative Physiology
- Jeffrey A. Woods, Kinesiology and Community Health
<table>
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<tr>
<th>Units/centers/programs represented in Task Force</th>
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<td>• Biomedical Imaging Center at the Beckman Institute</td>
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<td>• Agricultural and Consumer Economics</td>
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<td>• Beckman Institute for Advanced Science and Technology</td>
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<td>• Cell and Developmental Biology</td>
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Health Sciences Strategy Task Force Town Hall Meeting: February 12, 2018
Health and Well-Being

With the aim of **enhancing people’s lives** and **expanding the human experience**, we hope that our colleagues and leaders from the broad areas not represented on this task force as members will continue to make their **profound** contributions in addressing **health** challenges and **boosting well-being**, and will feel welcome to join us in elevating Illinois’ local, national, and global impact in the health sciences arena.
Campus-wide input to Task Force

Leadership Council
ACES, AHS, Beckman, Engineering, IGB, IHSI, LAS, CI COM, Social Work, Vet Med

CRAWG
Campus Research Administrators Working Group

Data Experts
DMI, AITS, Illinois Experts, SPA, University Library

Individual Units and Stakeholders

Electronic Letter and Invitation to Contribute
Online form or directly

Town Hall Meetings
In what areas does Illinois have the greatest opportunity to positively impact state, national and global health through research, education and engagement?

• Analyze the current landscape and identify areas:
  • Leveraging greatest existing campus strengths
  • Leveraging most significant/impactful existing campus investments
  • Demonstrating clearest promise of attracting significant new external funding and national leadership reputation

• Vision: Create SYNERGISTIC opportunities that advance the entire health sciences landscape at Illinois
Identifying Areas for Greatest Impact

• Top assets, commitments, and investments in health sciences reported by Deans and Directors of multiple Colleges and Institutes uncovered obvious areas of strength

• Task Force teams reviewed, researched, and obtained additional input from colleagues (internal and external to Illinois) to augment and clarify each area

• Areas adjusted and refined to reflect knowledge gained from various data, campus units, and stakeholders over months of information-seeking process

• Supporting information, analysis, and recommendations for each area included in the Final Report of the Task Force
Identifying Opportunities for Greatest Impact

- National Institutes of Health (NIH) designation of cancer and neuroscience for priority funding through the Cancer Moonshot and the BRAIN Initiative
- Increasing dependence on technology for health and medicine solutions
- The National Academy of Sciences’ emphasis on transdisciplinarity as the key to science in the 21st century
- Increasing societal investment in health and well-being, disease prevention through healthy lifestyle choices, successful aging, survivorship from serious disease, and successful rehabilitation
- Growing awareness of the need to address disparities in healthcare access
- Increasing volume of patient data inundating our healthcare system
Impact Areas and Cross-Cutting Threads

- Cancer
- Maternal and Child Health
- Microbes
- Neuroscience and Behavioral Health
- Progenerative Medicine
- Health Disparities
- Tech4Health
Cancer
Innovations through Engineering and Comparative Oncology Approaches

• The 2\textsuperscript{nd} leading cause of death in the U.S.

• 4 in 10 of all Americans will be diagnosed with cancer in their lifetime
Maternal and Child Health
Targeting the First 1,000 Days to Ensure a Healthy Future

- What happens in the first 1,000 days of life has lifelong impact
Microbes
Drivers of Health and Disease

- Microbes affect all aspects of life on the planet
- Microbes are both drivers of health and well-being and the cause of (infectious) disease
Neuroscience and Behavioral Health
Mechanisms and Interventions

• 1 in 4 people in the world will be affected by neurological or mental disorders

• 11 institutes of the NIH fund neurological or psychological research

• People’s behaviors and lifestyle choices have huge impact on their health, well-being, and life success
  • Social and Behavioral Science
Medical practice has long been about treating disease; Progenerative medicine instead targets the forward design of human health.
Health Disparities
Promoting Health Equity Locally and Globally

• In 1966, Dr. Martin Luther King Jr stated, “Of all forms of discrimination and inequalities, injustice in health is the most shocking and inhuman”

• Health disparities are large, persistent, and intergenerational
  • Food Security, Diversity, Globalization
• Applying Illinois’ extraordinary expertise in technology, computation, and data science to transform healthcare
Illinois’ commitment to health and well-being is not contained within any one department, college, or unit. Each impact area and thread is broad, inclusive, and interdisciplinary.

- The **Cancer Center at Illinois** connects 70+ full members across 15 departments, 6 colleges, and 4 institutes.

- The **Family Resiliency Center**, a focal point for Maternal and Child Health, unites researchers from various disciplines, students, faculty, and community members.

- **Microbe-themed human and animal research** permeates 22 units across campus, with even greater impact when expanded to bioenergy and plant-related research.

- The **Neuroscience Graduate Program** includes 87 faculty in 17 departments and 7 colleges.

- The **Social and Behavioral Sciences Initiative** engages scientists from 45+ departments to address a variety of challenges, including those related to behavioral/mental health.

- **Health Disparities** includes issues of diversity and inclusion, food insecurity, community engagement, educational opportunity, and health equity.
What opportunities and challenges do we face in health-related research and education over the next five to ten years?

• **Challenge #1: Leveraging Interdisciplinary Strengths that Bridge Different Units**
  - 28% of all tenure-track faculty in health activities, but widely distributed across 15 colleges, NIH-funded faculty in 26 departments

• **Strategy #1: Campus-Wide Commitment to Identified Impact Areas & Cross-Cutting Threads**
  - Cross disciplinary boundaries and bridge widely distributed units to create a unified, campus-wide roadmap for success
What opportunities and challenges do we face in health-related research and education over the next five to ten years?

- **Challenge #2: Obtaining Large-Scale, Long-Term NIH Funding**
  - Illinois received 2.4% of NSF funding vs 0.19% of NIH funding
  - High reliance on R01 funding; very few Centers *(5 in 2016; < $10M)* compared to our peers *(mean = 16; each of top 5 > $50M)*

- **Strategy #2: Centers of Excellence in Identified Impact Areas**
  - Leveraging and focusing existing campus strengths to attract NIH Center funding and create national leadership reputation
  - Strategy #1 and #2 converge – commitment to build-out identified Impact Areas with explicit goal of developing Centers of Excellence
  - Modeling of grant data from 232 US Institutions: ROI from adding new Centers: 1 Center multiplies NIH portfolio x 1.4 / 6 Centers multiplies x 10
What opportunities and challenges do we face in health-related research and education over the next five to ten years?

- **Challenge #3: Making Strategic Decisions that Broadly Benefit Health Sciences Campus-Wide**
  - Health sciences activities so distributed across campus that it limits our ability to initiate and implement fully informed, collaborative, strategic choices and investments

- **Strategy #3: Infrastructure Providing Critical Shared Support for Broadly Catalyzing and Coordinating Campus-Wide Success**
  - Shared strategic vision of synergistic excellence
  - **Shared core resources** with Clinical and Translational Science Institute (CTSI)-like capabilities that support and benefit all Centers
    - *Data Sciences, Public Engagement*
Health Sciences Ecosystem

Blueprint for Synergistic Excellence
Health-related Interdisciplinary Research Units

- Beckman Institute for Advanced Science and Technology
- Carl R. Woese Institute for Genomic Biology
- Coordinated Science Lab
- Frederick Seitz Materials Research Lab
- Health Care Engineering Systems Center
- Illinois Program for Research in the Humanities
- Interdisciplinary Health Sciences Institute
- Micro and Nanotechnology Lab
- National Center for Supercomputing Applications (w Blue Waters)
- Roy J. Carver Biotechnology Center / Keck Center
Clinical and Corporate Partners

- **Carle**: Major clinical partner for clinical and translational research; home of the Biomedical Research Center

- **OSF**: Current partnership through Jump Arches; strong potential to expand

- **Mayo Clinic**: Mayo Clinic and Illinois Alliance for Technology-based Healthcare; proposed Computational AI and Health Data Analytics Center

- **Corporate Partners**: Investment and partnership opportunities; startups

- Possible co-localization in proposed iHIT
Impact Areas ➔ Prospective Centers

- One Health Center for the Genomics of Infectious Disease
- NCI-designated Cancer Center
- IHSI/ Clinical & Translational Science Institute (CTSI)
- Center for Progenerative Medicine
- Center of Excellence in Interventional Neuroscience
- Computational AI and Health Data Analytics Center (to partner with Mayo Clinic)
- Center of Excellence Addressing Health Disparities in the First 1,000 Days
How can we better leverage our research strengths to enhance the university’s educational mission in health-related fields?

• Research-oriented Task Force was necessarily humble in making educational recommendations; we suggest campus educational leaders take next steps.

• Partnering of the (other) Academic Colleges with Carle Illinois College of Medicine in educating physician-scientists, physician-engineers, and physician-innovators.

• Creation of new majors, minors, and professional programs around health sciences in many Academic Colleges.

• New opportunities for hands-on education with clinical and corporate partners.

• New opportunities for enhanced training and education in clinical and translational research and innovation.
The area of health presents many opportunities for community engagement. How best can we engage our local community through the health sciences?

• Strengthen programs and connections to university engagement “outposts” (engagement sites / touchpoints / points of contact) in the community

• Investment in a Health Sciences Community Engagement Core
  • Public Engagement

• Community outreach as an integrated part of research (Engaged Research)

• Development and support for Health Sciences Scholars embedded in community programs (Engaged Education)
Community Engagement

Other Elements of the Health Sciences Ecosystem

- Clinical and Corporate Partners
- Health-Related Institutes and Centers
- Academic Colleges and Various Units

Community Outposts / Engagement Sites

- Mobile Units
- Local Schools
- Illinois Extension
- Libraries
- Recreation Programs
- Family Resiliency Center

IHSI/CTSI Community & Collaboration Core

- One Health Center for the Genomics of Infectious Disease
- NCI-designated Cancer Center
- Computational AI and Health Data Analytics Center (to partner with Mayo Clinic)
- Center of Excellence Addressing Health Disparities in the First 1,000 Days
- Center of Excellence in Interventional Neuroscience
- Center for Progerative Medicine
What specific actions would be most effective in realizing our potential in health education, research and engagement?
Recommendation #1: Investments in Identified Impact Areas and Cross-cutting Threads

Recommendation #2: Investments in Creating Centers of Excellence

Programs to Address Health Disparities

Recommendation #3: Investments in Infrastructure Providing Critical Support for Illinois Health Sciences

Locally-Focused Program Within the Family Resiliency Center to Reduce Health Disparities During the First 1,000 Days

Multi-Modal Human Imaging Facility (including 7 Tesla scanner, cyclotron, and PET/CT System)

Brain 'Oomics Center

Neurobehavioral Assessment Lab/Core for Humans and Animals
Health Sciences Ecosystem

Blueprint for Synergistic Excellence

Clinical and Corporate Partners

Academic Colleges

Illinois Health Innovation Translator (iHIT)

First 1,000 Days

Health-Related Institutes and Centers

Genomics of Infectious Disease

Cancer

Progenerative Medicine

Interventional Neuroscience

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