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The UMCCTS: A Decade of Advancing Health Through Translation

Katherine Luzuriaga
University of Massachusetts Medical School

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The UMCCTS: A Decade of Advancing Health Through Translation

Katherine Luzuriaga, MD
PI and Director, UMass Center for Clinical and Translational Science
Vice Provost, Clinical and Translational Research
UMass Memorial Health Care Endowed Chair in Biomedical Research
Professor, Program in Molecular Medicine, Pediatrics, and Medicine
Disclosure

I have no actual or potential conflict of interest in relation to this program/presentation.
### Thank you!

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Vanni Bucci, PhD</td>
<td>UMass Dartmouth</td>
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<tr>
<td>Wanda DePasquale</td>
<td>UMass Medical School</td>
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<tr>
<td>Charlie P. Emerson, Jr., PhD</td>
<td>UMass Medical School</td>
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<tr>
<td>Nate Hafer, PhD</td>
<td>UMass Medical School</td>
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<tr>
<td>Elinor Karlsson, PhD</td>
<td>UMass Medical School</td>
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<td>Catarina Kiefe, MD, PhD</td>
<td>UMass Medical School</td>
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<td>Margaret Koziel, MD</td>
<td>UMass Medical School</td>
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<td>John Landers, PhD</td>
<td>UMass Medical School</td>
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<td>Jill A. Macoska, PhD</td>
<td>UMass Boston</td>
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<tr>
<td>Stephen McCarthy, PhD</td>
<td>UMass Lowell</td>
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<td>Beth McCormick, PhD</td>
<td>UMass Medical School</td>
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<tr>
<td>Peter Reinhart, PhD</td>
<td>UMass Amherst</td>
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New Poverty-Related Neglected Diseases (‘The NTDs’)
• One billion people treated for a neglected tropical disease in 2015, including 114 million for river blindness.

• Very close to global eradication of Guinea worm disease:
  – 3.5 million human cases in 1986
  – 25 reported cases in 2016

• Sleeping sickness cases:
  – 37,000 new diagnoses in 1999
  – Under 3,000 in 2015
An Ecosystem that Drives Innovation in Translational Research

- Capitalizes on research strengths of the 5 UMass-campuses
- Provides cores, services, funding to catalyze transdisciplinary collaborations and to create product pipelines
- Creates new training opportunities
By fostering collaboration and trans-disciplinary science, the UMass “Open Lab” culture is particularly suited to advancing Precision Medicine.
Life Sciences Moment Fund
2009 – present

- 30 Projects
- $3.67 mil
- 71 Researchers
- 37 Different Departments

ACROSS ALL 5 CAMPUSES

Medical School
- 36 Researchers
- $1,756,144 (48%)

Amherst
- 21 Researchers
- $959,774 (27%)

Lowell
- 6 Researchers
- $396,190 (11%)

Boston
- 6 Researchers
- $311,701 (9%)

Dartmouth
- 2 Researchers
- $100,000 (3%)

PRODUCING
- 39 Peer-Reviewed Papers
- 15 New Grant Applications
- $15.7 mil New Grant Funding from 9 Different Funding Bodies
- 46 Young Investigators Trained

The UMass Center for Clinical and Translational Science is part of the Clinical and Translational Science Award (CTSA) program, funded by the National Center for Advancing Translational Sciences (Grant # UL1-TR001453) at the National Institutes of Health (NIH).
UMCCTS Co-Author Network Growth: 2008 - 2016

- 2008-2010 (n=31 authors)
- 2008-2011 (n=210 authors)
- 2008-2012 (n=329 authors)
- 2008-2013 (n=888 authors)
- 2008-2015 (n=1439 authors)
- 2008-2016 (n=1550 authors)
The Health System as a Learning Lab

Collaborative Support for Health System and Communities as Learning Labs for:

- Research
- Improvement (Quality, Efficiency, Cost)
- Clinical & Translational Science
- Education
- Health systems strengthening and Public Health

Achieved through collaboration on:

- Data Lake (integrates clinical/research data)
- Clinical Research Support
- Policies and procedures (governance, access, security)
Vision: Build an Integrative Clinical and Biospecimen Data Ecosystem to:

- Enable data driven research
- Enable translation of research findings to clinical care
- Make a difference in community and global health
**D³Health: Integrating Biomedical Big Data, Analytics, & Decision Support**

**Data Collection**
- Smart/Sensor Data
- Hospital EHR Data
- Remote monitoring of patient wellness and disease data; environmental data

**Data Lake**
1. Aggregation
2. Data Integration
   - Data from Remote/Sensors is integrated with clinical data

**Predictive Analytics**
3. Pattern Recognition
4. Artificial Intelligence
5. Algorithms
   - Knowledge is generated and actionable intervention points are identified

**Decision Support**
6. Knowledgebase with Actionable Intervention Points & Generation of Feedback Loops
7. Provider Feedback
8. Patient Feedback

**Intervention Alerts**
- Patient Alerts (e.g. changes in Transthoracic Bioimpedance)
- Community Alerts (e.g. Infection outbreaks)

**Targeted Clinical Trials**
- More Effective Precision Therapy
- Community Alerts (e.g. Infection outbreaks)
- Patient Alerts (e.g. changes in Transthoracic Bioimpedance)

**Patient Alerts**
- Patient Feedback

**Remote Monitoring**
- Targeted Clinical Trials
- Patient Feedback

**Intervention Alerts**
- More Effective Precision Therapy
- Provider Feedback

**Data Integration**
- Hospital EHR Data
- Smart/Sensor Data
- Remote monitoring of patient wellness and disease data; environmental data
Leverages the engineering and business strengths of UML, along with the clinical and biomedical research strengths of UMMS to provide early stage inventors and established MA companies with easy, affordable access to services that move new medical devices from concept to production.

Founded 2008 with ~$5M University and State Funds

- Services: Assisted > 100 medical device companies to raise ~ $77M in private investment funds and $9.6 million in grants, 97 interns
- Facilities: Two incubators currently host 22 client companies in a combination of wet lab, open collaboration, and office space
- Funding: Annual new venture competition
- $75M in economic development in 2014
- **NEW UMMS INCUBATOR – FALL 2017**
Diabetes Innovation Challenge

- Partnership: M2D2 and T1D Exchange (Type 1 diabetes patient group)
- 60+ applications from around the world
- Sponsors: ADA, JDRF, Medtronic, Lilly, J&J Innovation, Becton Dickinson, Law and Accounting firms

- Early stage winner: Integrated Medical (Irvine, CA) Fully-integrated, low cost, implantable, wireless, continuous glucose monitoring platform
- Late stage winner: Enable Biosciences (San Francisco, CA) Ultrasensitive non-radioactive autoantibody test that can be readily used for population screening
MassBiologics of UMMS

Mission: “Medicine for Better Lives”

For >100 years, MassBiologics has worked to improve public health through applied research, development, production, and clinical testing of biologic products.

Only non-profit, FDA-licensed vaccine manufacturer in the United States
- Incubator for innovation and improvement in the processes of vaccine and biologics development
- Recently approved products
  - Zinplava: reduction of recurrent C. diff in adults on antibiotics at high risk for C. diff recurrence
  - Rabishield: rabies Mab
- New grants: NCATS preferred contractor
- National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)
Global Impact

- Isolation of Ebola antibodies from survivor (Mass Biologics; Science, 2016)
- Public health lab capacity in Liberia (Paul Allen, CDC: $27.5M)
  - Liberia’s Men’s Health Screening Program (MHSP): 10% of male Ebola survivors harbor RNA in semen; can persist up to 565 days
  - First large scale GMP plasmapheresis facility in Africa (Grifols)
UMCCTS Mentored Career Development and Clinical Research Scholar (K) Awardees

- Founded in 2007: 12 supported
- 33 successful grant applications (80%)
- $40,207,226 total awarded
- 381 Peer-Reviewed Publications
- 100% of K graduates still active in Clinical and Translational Science
Nancy Byatt, DO, MS, MBA
Associate Professor, Psychiatry and OBGYN

• 2013: CCTS K Award, Rapid Access to Perinatal Psychiatric Care in Depression (RAPPID)
• 2014: Founding Medical Director, Massachusetts Child Psychiatry Access Program for Moms (MCPAP for Moms)
• 2015: U01 award – 1 in the nation – RAPPID: an Innovative Stepped-Care Approach for Obstetrics and Gynecology Clinics
• 2016: 21st Century Cures Bill appropriates $5M for 5 states to develop a program similar to MCPAP for Moms. Sponsor” Congresswoman Katherine Clark, MA-05
CRISP supports the development of independent University of Massachusetts researchers who conduct community engaged research. Community engaged research involves collaboration with community partners along the translational research continuum.

Lorraine Cordeiro, PhD, MPH
Food Security, Traditional Health Practices, and Health Education among Immigrant and Refugee Women in the United States
Partnering with the Cambodian Mutual Assistance Association of Greater Lowell, Inc., Dr. Cordeiro collected and analyzed samples of traditional medicinal concoctions used by post-partum Cambodian women in Massachusetts.

Christopher Denning, PhD
Adapting and Piloting a Physical Activity Program for Young Children with Autism Spectrum Disorder
Dr. Denning worked with the special education director for the Quincy Public Schools to develop and implement a physical activity and motor development program. He then studied the effects of the program on fitness levels, social skills, and behavioral problems in the children.

Rachel Kulick, PhD, MEd
UMass Dartmouth Grows: Ecological and Equity Based Approaches to Food Justice
Dr. Kulick partnered with students and faculty at New Bedford High School to launch a comprehensive program focusing on food justice including planting a community garden, designing curriculum for environmental science classes, and mapping food areas in the community.

Harpreet Thind, PhD, MPH, MBBS
Community-Based Yoga to Improve Adherence to Weight Loss Recommendations
Dr. Thind worked with the Lawrence Senior Center and Lowell General Hospital to study the effects of yoga for patients pre- and post-bariatric surgery including changes in behavioral and psychological factors.

2017 CRISP Scholars
- Leslie Wang, PhD
- Angela Walter, PhD, MPH, MSW
- Michelle Trivedi, MD, MPH
- Kristin Murphy, PhD

All four 2016 Scholars are seeking future funding (NIH R21, R16, and AREA R15) to build on the findings of their initial projects.
Cross-CTSA Collaborations

Funded:
U01 - Strengthening Translational Research through Diverse Enrollment (STRIDE) award (Lemon and Allison; UMMS, Harris-Vanderbilt, Saag-UAB)
Admin Supplement - I-Corps at NCATS (Hafer; UMMS, Rockefeller, UAB, GA Tech, Penn State, UC Davis, Colorado, Michigan, Miami)

Awaiting Funding:

Under Review:
U01 - Individual Development Plans for Clinical and Translational Scientists in Training: Defining Best Practices (Fuhrmann, Keaney, Allison, and Hafer; UMMS with 20+ Centers)
Admin Supplement - Multi-CTSA mini-Sabbatical Evaluation and QUality Improvement (SEQUIN) project (Allison and Lemon; UMMS, NYU, UAB)
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<th>Time</th>
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Moderators: Yunsheng Ma, PhD, MD and Katherine Tucker, PhD |
|              | 2. Building Bridges to “Cross the Quality Chasm”: The Challenges of Engaging Clinicians in Patient-Centered Care  
Moderator: Kathleen Mazor, EdD |
|              | 3. The Problems with Marijuana and Driving: Medical, Legal, and Public Health Perspectives  
Moderator: Peter Friedmann, MD, MPH |
Moderator: Raymond Dunn, MD |
|              | 5. SPRC: The Community Partner’s Experience  
Moderators: Isabelle Pierre-Louis, MPH and German Chiriboga, MPH |
|              | 6. Pregnant and Parenting Mothers with History of Opiate Addiction  
Moderators: Elizabeth Peacock-Chambers, MD and Robert Roose, MD |
Interested in NETWORKING?

Join your group

Join your group

Lunch
12:50-1:45 pm

Look for themed table tents (or add your own) and join your colleagues for networking and collaboration

Let’s collaborate!

M2D2
Quantitative Methods
Informatics
Community Engagement
Dueling For Dollars
Advancing your research with private sector partners

Confirmed Panelists

Steve Weinstein
Managing Director
Novartis Venture Fund

John Hallinan
Chief Business Officer
Massachusetts Biotechnology Council

William Scatzulli
Director of Investments
The Kraft Group

Bharatt Chowria
President
Pure Tech Health

John Delany
Executive Director, BD&I
Merck Research Laboratories

Save The Date - May 30, 2017

Interactive Panel Discussion:

- Learn about different kinds of Investors, Entrepreneurs, and Partners
- Engage with Industry Leaders
- 1:30pm Presentation by MassBio and Panel discussion around UMass Faculty Pitch session
- 4:00pm Networking reception with cheese and cocktails

Register now for our annual event!
Go.umassmed.edu/MassTERi
Enjoy the Retreat!
D3Health
Center for Autonomous Chemistry (led by UMA)
Center for Smart and Connected Society (led by UMA)
Probiotic Discovery Engineering and Manufacturing Pipeline (UMD)
UMass Consortium for Research on Imaging and Informatics (UML)
UMass MOVEment Research Center: Exploring the Mechanics of Movement and Muscle Function (UML)