Oct 17th, 12:00 PM

Medical Device Innovation in Massachusetts -- M2D2: Massachusetts Medical Device Development Center

Stephen P. McCarthy  
*University of Massachusetts - Lowell, stephen_mccarthy@uml.edu*

Steven Tello  
*University of Massachusetts - Lowell, Steven_Tello@uml.edu*

Nathaniel Hafer  
*University of Massachusetts Medical School, Nathaniel.Hafer@umassmed.edu*

Follow this and additional works at: [http://escholarship.umassmed.edu/umccts_seminars](http://escholarship.umassmed.edu/umccts_seminars)

Part of the [Analytical, Diagnostic and Therapeutic Techniques and Equipment Commons](http://escholarship.umassmed.edu/analytical-diagnostics-equipment), and the [Translational Medical Research Commons](http://escholarship.umassmed.edu/translational-medical-research)

This work is licensed under a [Creative Commons Attribution 4.0 License](http://creativecommons.org/licenses/by/4.0/).

[http://escholarship.umassmed.edu/umccts_seminars/2013/seminars/4](http://escholarship.umassmed.edu/umccts_seminars/2013/seminars/4)

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Seminar Series by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.
Medical Device Innovation in Massachusetts

M2D2: Massachusetts Medical Device Development Center

Directors:
Stephen McCarthy
Steven Tello
Nate Hafer
M2D2
Massachusetts Medical Device Development Center
UMass Lowell & Worcester

Connect the Resources of the University of Massachusetts to Medical Device firms within Massachusetts

26 UMass Lowell and 18 UMass Worcester Faculty Steering Committee – 24 Investment and Industry Leaders
With M2D2 They Reach Across

M2D2

Inventors
Ideas
Patents

Product Development
Business Development
Medical Development

Investors
Products
Jobs

M2D2: Fueling the Life Sciences Economy
M2D2: An Economic Engine for the Medical Device Industry

- M2D2 Gets New Medical Device Ideas from Patent to Production
- Partnership with UMass Medical School
- Industry focused, industry engaged
- Statewide Reach
- Model for Regional Innovation Center
UMass Partnership

Lowell: Engineering Expertise
- Materials Characterization, Analysis, Selection
- Design and Prototyping
- Testing and Verification

Lowell: Business Expertise
- Opportunity Assessment, Business Planning
- Market Identification, Analysis
- Integrated into Graduate Courses

Worcester: Clinical Expertise
- Surgeons with Ideas
- Partnership with Pre-Clinical Investigators
- Large animal testing/clinical trial facilities
M2D2 Prototyping Capabilities

• 26 UMass Lowell Faculty Spanning 11 Departments
  – Biological Sciences
  – Chemical Engineering
  – Clinical Lab and Nutritional Services
  – Electrical and Computer Engineering
  – Health and Environment
  – Management
  – Mechanical Engineering
  – Physics and Applied Physics
  – Plastics Engineering
  – Radiation
  – Work Environment Health
• UMass Worcester and UMass Memorial Medical Center Physicians and Researchers to provide rapid design feedback
• Network of Private Sector Design, Fabrication and Testing Firms
M2D2 Business Assessment

• Phase I - Initial Business Assessment Process
  • 3-6 page summary of Business Opportunity
    - 40+ Reviews to Date
  • Integrated into UG/G Coursework
  • Initial Review by Management Team, Prioritize
  • Factor into FastTrack, Inventor-Funding Decs.

• Phase II - Business Plan Consultation
  • Longer term engagement with Inventor-Founder
  • Consult w/Expert Business Faculty & Grads/
  • Assist in Business Plan Development
UMass Worcester and UMass Memorial Medical Center
Facilitate partnership with clinical investigators
Provide access to patient population for clinical trials
Provide regulatory support for FDA submissions
Medical expertise across broad therapeutic areas:
- surgery (plastic, wound healing, vascular, urology)
- medicine (cardiology, digestive diseases, diabetes)
- radiology (interventional, imaging); pediatrics, geriatrics
- women’s health (urogynecology, endocrinology)
Dedicated central service for support through life cycle of clinical study (feasibility to close-out)
National Center for Advancing Translational Sciences

- Highest priority of NIH Director, Dr. Francis Collins
- Focused on advancing the science of translational medicine and enhancing the efficiency of developing novel approaches to prevent or treat diseases
- New Director (Sept, 2012): Christopher P. Austin, M.D.
- Success measured by novel products in clinical use and advances in clinical practice
**M2D2 Economic Development**

- UMass President  (2005)  $135,000
- Mass. Capital Funds  (2007)  $4,000,000

**Direct Funding to Start-Ups**

- Federal SBIR/STTR  $4,700,000
- Company Investment  $22,000,000

- 40 Companies  152 Employees  37 Interns
Flow Forward Medical

Wearable Blood Pump System to Enhance Arteriovenous Fistulae Eligibility
Raised $6 million
Proprietary wireless remote patient monitoring platform for superior heart arrhythmia monitoring and diagnosis

Raised $3.2 million
12 Employees
Vista
Topical Ophthalmic Drug Delivery Device

$1.6 million NIH SBIR Grant
VasoTech
Biodegradable Drug Eluting Stent
$1.2 million NIH STTR
Lucifics
Photodynamic Therapy for Non-melanoma Skin Cancer
SafePath

Safety Suture Needle

Eliminates accidental needle stick injuries in hospitals.
TheraTorr Medical

Reactive Mattress to Prevent Pressure Ulcers
M2D2 FastLane Award
Raised $1.4 million
MedicaMetrix

ProstaGlove – Prostate Measurement
M2D2 FastLane Award
Raised $3.5 million
M2D2 Advisory Board
Industry Focused & Engaged
U.S. Rep. Niki Tsongas, left, watches a demonstration from Howard Loree, vice president of Research & Development at Flow Forward, a tenant firm of the Massachusetts Medical Device Development Center in Lowell. Tsongas visited the center Friday to learn about developmental-stage companies. Flow Forward is developing a product that opens veins in such a way as to make them more accessible for medical procedures. COURTESY PHOTO
M2D2 “liked” by U.S. Senator Elizabeth Warren
Thank You

Director Stephen P. McCarthy, Ph.D.
Engineering, UMass Lowell

Director Steven Tello, Ed.D.
Business, UMass Lowell

Director Nate Hafer, Ph.D.
Medical, UMass Worcester
Massachusetts Medical Device Ecosystem

Steven Tello, Ed. D.
Assoc. Vice Chancellor, UMass Lowell
Director, M2D2
Massachusetts

- 6.65 million residents
- $365 B annual economic output (GDP)
- 13th largest US economy (7.2% unemployment)
- Key Industry Sectors include:
  - Biopharma & Medical Devices
  - Business, Financial & Legal
  - Computer & Hardware
  - Defense Manufacturing
  - Diversified Industrial Manufacturing
  - Health Care Delivery
  - Post Secondary Education
  - Software & Communications
Mass. Life Science Cluster

- Biotechnology
- Medical Devices
- Pharmaceuticals
- Wholesale Trade
- Medical Testing Laboratories
- Teaching Hospitals

- $1 B State commitment through Mass. Life Science Center
Impact of Med Device Companies in Mass.

- 400 Med. Device Companies
- 24,300 employees
- Mix of companies

<table>
<thead>
<tr>
<th></th>
<th>Small &lt;30 Emp.</th>
<th>Medium 30-300 Emp.</th>
<th>Large &gt; 300 Emp.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>304</td>
<td>86</td>
<td>13</td>
</tr>
</tbody>
</table>

- Eastern/Central Mass. Focus
- 41% in Middlesex County
Impact of Med Device Companies in Mass.

- Broader economic impact
- 3.4 X multiplier in related industries
  82,500 employees

- 13% of Mass. Exported Goods - $3.4 B
  Fastest growing export category

- Captured 12% of US Med Device venture funding
  $ 329 M Med Device
  $1,084 M Biotech Investment
Range of Good Jobs Created

**BASIC RESEARCH**
- SCIENCE
  - Ph.D Biology, Chemistry, BS, MS Research Assts.
  - Lab Technicians

**APPLIED RESEARCH**
- SCIENCE & ENGINEERING
  - PhD Researchers
  - MD, Clinical Researchers
  - Research Assts.
  - Statisticians
  - Clinical Lab Tech

**PROTOTYPE & DEVELOPMENT**
- ENGINEERING, REGULATORY & BUSINESS
  - Engineers
  - NPD/Operations
  - Finance
  - Manufacturing
  - Market Analytics
  - QA/QC
  - Regulatory Technicians

**COMMERCIALIZATION**
- BUSINESS LAUNCH & OPERATIONS
  - Accounting & Finance
  - Customer Serv.
  - Marketing
  - Medical Affairs
  - Brand Managers
  - Manufacturing Operations
  - Sales & Distribution
Why Massachusetts?

- World-Premiere Medical & Research Institutions
- Highly educated workforce – 50% + college
- Engaged High Ed Community, Angel/VC, Industry/Trade Councils
- Government commitment
- Established and Startup Life Science Companies
- Business Services to support Company Growth
- Willingness to Partner
Networks in Massachusetts

• M2D2
  – Concept to Prototype, Resource Network
  – Business, Clinical, Engineering Assistance
  – Incubator

• Massachusetts Life Sciences Center
  – Research Funding, Accelerator Funding
  – Infrastructure Support, Summer Intern Program

• MassMEDIC
  – MedTech Ignite
    Mentoring by Experienced Med Tech Execs,
    Education programs
Other Networks

• MATCH Team – University of Ulster
  – Explore technical and business development
  – Reserch and education partnerships

• Mass. Technology Transfer Center
  – Platform Presentation
  – Entrepreneur/Inventor Training
  – Revolving Grants Program

• Massachusetts Technology Collaborative Innovation Institute
  Innovation activities across industry sectors in Mass.
  – IT/Wireless, Life Sciences, Medical Devices
Closing Thoughts

• Medical Devices are a subset of the larger Life Science Cluster

• Development of this subset has significant multiplier implications
  – Creates range of research, development and employment opportunities
  – Research to Market more quickly than Big Pharma

• You may already have the ecosystem in place
Resources

• www.uml.edu/m2d2

• The Medical Device Industry in Massachusetts – Deloitte & Touche, LLP, MassMEDIC Annual Meeting, May 3, 2011

• Annual Index of the Massachusetts Innovation Economy 2012, Innovation Institute, Mass. Technology Collaborative