Jump Starting and Moving New Technologies to Marketplace

An open discussion of the needs of business leaders and academic researchers as they work together to transition technologies to market.

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NGA Best Practices

• Integrate Entrepreneurship into State Economic Development Efforts
• Use the Education System to Nurture and Encourage Future Entrepreneurs
• Incubate Entrepreneurial Companies
• Invest in Diverse Sources of Risk Capital for the State’s Entrepreneurs and Growth Companies
• “Get out of the Way” through Regulatory and Reform and Streamlining
Where is the Innovation?

• High-tech small business generate five times more patents per R&D dollar than large businesses.¹

• SBIR-funded companies are about 20 times more productive than universities in generating patents per federal dollar.²

• Small businesses with less than 20 employees have generated more than 80 percent of all net new jobs during the past 14 years.³


[2] Source: Ann Eskesen, President, IDI, from her proprietary SBIR database, the most extensive in the world. The IDI database shows consistency in the SBIR vs university patent productivity over the history of the SBIR program.

## Technology Company Current Resource Needs

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
<th>Source: BRIDG Learning Experiences and Preferences Survey Data, March 2003</th>
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</thead>
<tbody>
<tr>
<td>Sales and Marketing</td>
<td>4.9</td>
<td>5.0</td>
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<tr>
<td>General management</td>
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<tr>
<td>Innovation</td>
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<tr>
<td>Strategic planning</td>
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<tr>
<td>Financial planning/acquiring funds</td>
<td>4.2</td>
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<td>Accounting &amp; financial control</td>
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<tr>
<td>Information technology</td>
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<td>Research &amp; development</td>
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<td>Personnel &amp; HR management</td>
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<td>Legal Issues</td>
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<tr>
<td>Production and plant management</td>
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<tr>
<td>Managing distribution and inventory</td>
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<td>3.0</td>
</tr>
</tbody>
</table>

*Rating Scale: 0 = Not at all  7 = Very*
Innovation Players

- Universities & Tech Transfer Offices
- Corporations, R & D Efforts
- Small Business Innovators
- Investors & Capital Formation
- Intellectual Property & Legal
Innovation/Discovery Connectors

- **Finger Tip Resources:**
  - Missouri Technology Corporation
    - Research Alliance of Missouri – RAM
  - Small Business and Technology Development Centers (SBTDC)
  - SBTDC MO Fast Initiative
  - Innovation Centers
  - Missouri Enterprise
  - Procurement Assistance Centers
Innovation-Led Business
Long-term high growth potential

Business Service Providers

University Research Centers
University Tech Transfer
Innovation Centers

SBTDC Innovation Centers
MoFAST

SBTDC, MOPTAC
Missouri Enterprise

Ongoing Venture
Implementation of commercial business practices; QC, HR, Legal, Finance
Access to markets Venture capital

New Venture Growth

Commercialization
Access to Venture Capital
Commercialization Assistance
Growth Space
Professional Management Team

Early Stage
Access to management teams
Proof of concept funding
• Phase 0 & SBIR Funding
• Angel investment
• Bridge loans
Incubator Space
Start-up assistance

Business Needs
Training and Counseling provided throughout the life of the business

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Second Stage Business
Expanding businesses create jobs

Business Service Providers

- SBTDC Missouri Enterprise
- Missouri PTAC
- Management Consultants
- Economic Development
- Corporations
- SBTDC Missouri Enterprise
- Revolving Loan Funds
- Banks
- Equity Investors

Growth and Expansion

Financing
- Securing Bank Loans
- Securing Financing

Competitive Challenges
- Competitive Research
  - Access to new markets
  - Product design and development
  - Cost reductions
  - Quality improvements
  - Finding Talent

Changes in the environment
- Competitive Benchmarking
- Facility Expansion
- Impact of new regulations
- Implementing new Technology
- Green/Sustainability issues
- Export Support
- Global Engagement

Strategic Planning
- Improved management practices
- Succession plans
- Leadership Training

Business Needs

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Missouri Technology Corporation
Research Alliance of Missouri

• To improve the well-being of Missourians through increased research productivity and technology innovation within Missouri universities.

• To promote economic development through increased collaborative efforts between the academic and business sectors.

• To provide greater access of Missouri businesses to university derived technologies.

Technical assistance for high-technology and high-growth companies; SBIR/STTR assistance.

- Marketing and financing assistance
- Agency identification and evaluation
- Proposal preparation and support
- Commercialization planning
- Strategic and business planning

(573) 884-1555
Innovation Tools

MoFAST

- **Phase 0** = MO TIP Assistance $5,000 - MTC
- **Phase 1** = Concept Development $75K - $150K Federal SBIR/STTR
- **Phase 2** = Prototype Development $750,000 - $1.5 Million – Federal
- **Phase 3** = Commercialization – Debt, Angel, Venture Capital

Business technical assistance in management, marketing and finance.

• Business Start-up Assistance
• Business Growth and Expansion
• Deliver through Training, Education and Counseling in management, marketing, finance, Commercialization, and Human Resources

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(573) 884-1555
Innovation Centers

• Offer a wide range of management and technical assistance to businesses

• Knowledgeable on up-to-date innovations to help businesses increase profits

• Assist entrepreneurs with developing business models, financing, space, marketing, networking and research
Helping sell to federal, state, and local government agencies.

• Research and find bidding opportunities.
• Help evaluate the opportunity.
• Assist with bidder registrations and certifications.
• Help in bid preparation and submission.
• Help with execution of contract.

Missouri Enterprise

Core Capabilities

• Continuous Manufacturing Process Improvement
• Quality Management Systems
• Product Design and New Product Launches
• Business Strategies, Marketing and Management
• Human Resource Management
• Information Technology
• Environmental and Energy Assessments and Improvements
• Technology Commercialization
• Supply Chain Management

Offices in Cape Girardeau, Kansas City, Park Hills, Rolla, Springfield and St. Louis

Contact information:
Missouri Enterprise
(800) 956-2682
info@missourienterprise.org
www.missourienterprise.org

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Brian Clevinger
Managing Director
Prolog Ventures
Angel & Venture Funding

• Angel Funding
  – Arch Angels
  – Centennial Investors
  – Mid-America Angels

• Venture Capital
  – Prolog
  – Rivervest
  – Oakwood
Andrea F. Sellers
Partner
Stinson Morrison Hecker LLP,
Kansas City, MO
Innovation and Intellectual Property

• To obtain meaningful protection at a reasonable cost:

  – Develop an IP strategy
  – Revisit the strategy regularly
  – Revise the strategy when needed
Commercialization of University Innovations

• Understand the technology
  – Stage of development
  – Opportunities for further development
  – Patent position

• Assess competitors’ patent positions
Developing an IP Strategy

• Assess the value of patent protection
  – Market position
  – Basis for funding
  – Source of licensing revenue

• Decide what to protect, how and where
  – Patent filings and maintenance
  – Trade secret protection/defensive publications
  – Strategic foreign markets
Paul Dale
Chief of Surgical Oncology
University of Missouri-Columbia
School of Medicine and Ellis Fischel Cancer Center
MU Biodesign and Innovation
Collaboration is the Key

Program Sponsors:
Department of Surgery
Co-director: Paul Dale, MD
College of Engineering
Co-director: Gregg Scheller
Missouri Technology Corporation

Program Coordinator:
Megan Jahnsen

Administrative Assistant:
Whitney Hays

Website:
www.MUBIODESIGN.com

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MU Biodesign and Innovation Fellowship

- Education of Idea to Market
- First group of fellows 2007
- 3 Person Fellowship Team Selection Process
  - Physician-Surgical Resident, Medical Resident
  - Engineer-M.S. or higher
  - Business Professional-MBA

Clinical Observation: 4 mo
Operating Room and Clinic
Filtering of Needs and Ideas

Engineering Phase: 4 mo
Product Design
Prototyping

Business Phase: 4 mo
Market Analysis
Business Model

Top Needs & Solutions
Product
Business Plan

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Facilitate Open Sharing of Ideas

CLN
- Critical Care
- Real-time patient monitoring

ENG
- Mechanophores
- Steady State Sensors

BUS
- Medical Informatics
- Information systems integration
Output of MUBIP Fellowship

- >400 CLINICAL NEEDS IDENTIFIED
- 18 Invention Disclosures
  - 1/8 of all FY09 Columbia campus disclosures
- 2 Provisional Patents Filed
- Prototype Animal Testing
- Founding of Limited Liability Company
  - SBIR application submitted
- Potential License to Industry
  - Laparoscopic Suction Device
- Sponsored Research Agreement
  - Discussion with A Medical Device Company
MUBIP STRENGTHS AND CHALLENGES

• Fosters Interdisciplinary Research at Faculty Level
  – Screening of Circulating Cancer Cells

• Proximity Promotes Collaboration
  – Schools of Medicine, Engineering, Business, Law and Veterinary Medicine and large tertiary hospital all on 1 campus

• Assists in Undergraduate Capstone Course
  – Mechanical and Biological Engineering

• “Super” Second Year Fellow
  – Focused on Commercialization and Product Development

• Challenges
  – Sustainable Funding
  – “Valley of Death” for Early Stage Projects
Kevin Sweeney
Chair, Life Sciences Practice Unit
Polsinelli Shughart P.C.
“Begin With The End In Mind”

Proactive Strategic Planning for Successful Life Science Commercialization Ventures

• Habit # 2 of the Seven Habits of Highly Effective People, by Stephen R. Covey
Key Challenge

- Scientists: In love with their technology, but don’t have a clue how to make a product out of it.
- Product Development Experts: Understand the market opportunity, but don’t understand the hurdles in scaling from lab to volume production models.
- VC’s: Understand the financial model but have misconceptions about the research variables that may impact milestone achievement.
- Lawyers: Well ....
Solution?

• “Begin with the End in Mind” from Day 1
• Identify Goals of Each Party in the Partnership
• Evaluate key drivers of value
• Evaluate key obstacles to success
• Proactive Strategic Planning - Elements
Proactive Strategic Plan – Business Model

• Identify the Core Science
• Identify the Product/Service Opportunity
• Define the Product Development Process
• Plan the Marketing and Product Launch
• Develop the Management Plan
• Identify the Exit Plan
Proactive Strategic Plan

- IP and Tech Transfer Plan
- Regulatory Process
- Risk Management
- Public Policy Issues
- Facilities and Real Estate
- Employment Issues
- Tax and Capital Structure
- Host and Strategic Relations
Proactive Strategic Plan – Expect the Unexpected

• “You Don’t Know What You Don’t Know”
• Avoid:
  – Pitfalls (unanticipated external issues)
  – Pratfalls (unanticipated internal issues)
  – The “Head in the Sand” Syndrome:
    • Avoid Talking About the Inevitable and It May Go Away
Examples Of Interactive Dependence

• Timing of Exit (pre-clinical, during clinical, post revenue, etc) may depend on:
  – Length of regulatory approval process
  – Availability and cost of capital
• Need for Strategic Partnerships may depend on:
  – Availability of Internal Expertise
  – Limited Number of Possible Strategic Purchasers
• VC “Pre-Money” Valuation may depend on:
  – Strength of IP Portfolio
  – Timing of Anticipated Exit
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