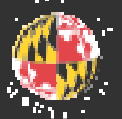


October, 2009

The Mtech experience:  
25 years of success in  
connecting academia to  
industry

David Barbe, Professor and  
Executive Director



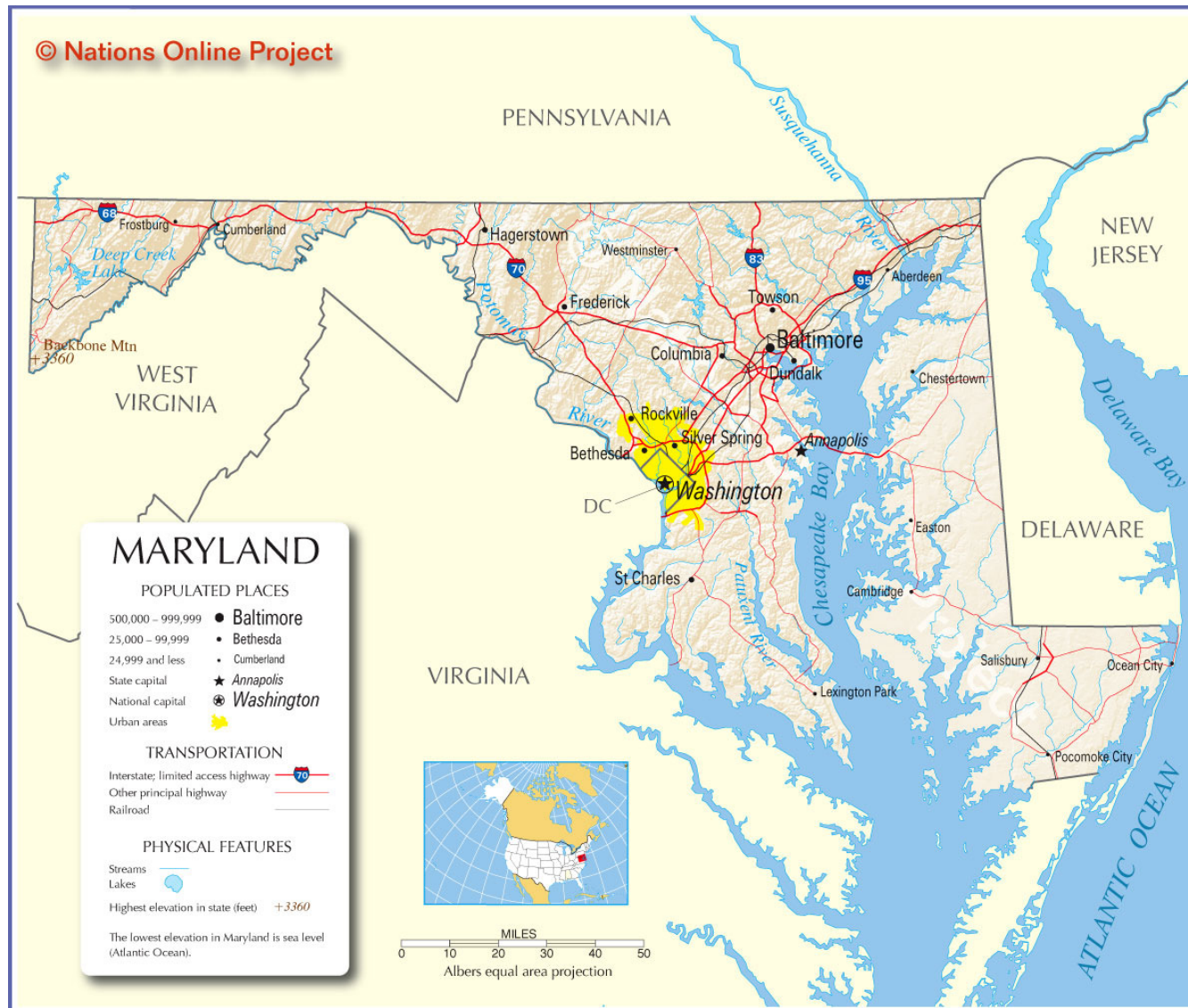


**Dzień dobry**

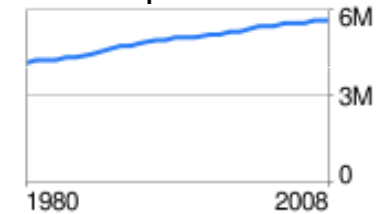
# Outline

- Mtech Context
- Mtech Overview/Impact
- Mtech Ventures
- Mtech Partnerships
- Mtech Education

# State of Maryland



Population

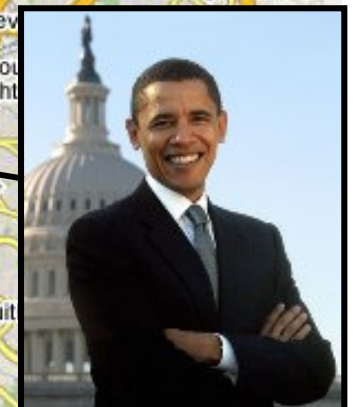


State General Budget = \$14.6B  
mostly from taxes





# University of Maryland



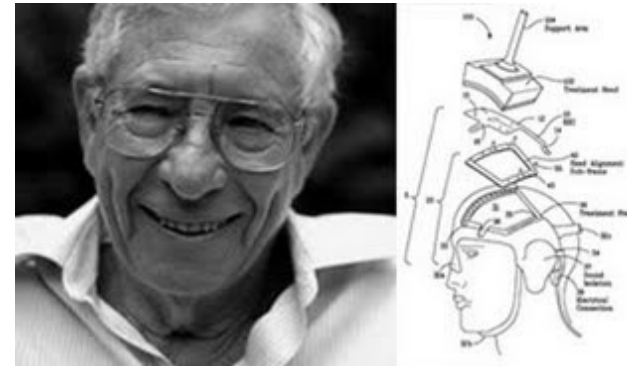
# University of Maryland Stats

- ~ 4,000 faculty/staff
- 37,000 students
  - 26,500 undergraduate students
  - 10,500 graduate students
- 127 undergraduate and 112 graduate programs
- 30 programs in top 10 & 55 programs in top 15
- \$518M in sponsored research in 2008

# UMD Alumni Entrepreneurs



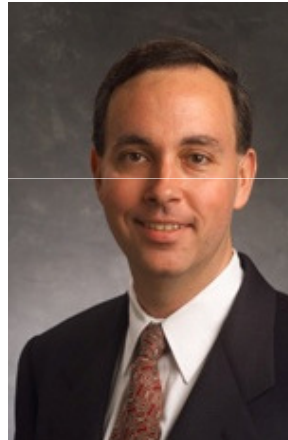
## Sergey Brin, BS '93 co-founder, Google



**Robert Fischell, MS '53**  
**213 Medical Device Patents**



**Jeong Kim, PhD '91**  
**founder, Yurie Systems**



**Brian Hinman, BS '82**  
**co-founder, PictureTel,**  
**Polycom, 2-Wire**



**Kevin Plank, BS '96**  
**founder, Under Armour**



# Clark School of Engineering

- 8 academic departments
- 2 Clark School institutes including Mtech
- \$171M in sponsored research in 2008
- 190 Faculty
- 3,000 undergraduate students
- 1,500 graduate students





# Mtech History and Mission

Mtech – Established via a proposal to the State by the Engineering Board of Advisors in 1984

MIPS funding in 1987 via a proposal by Mtech to the State

Current Mission:

To advance tech-based innovation through:

- Technology Entrepreneurship Education
- New Tech Venture Creation
- Partnerships with Maryland Companies



# Mtech Major Programs

## Partnerships

- Product R&D (MIPS)
- Biotech Scale-Up and Education (BREP)
- Manufacturing (MMP)
- International Incubator (MI<sup>2</sup>)

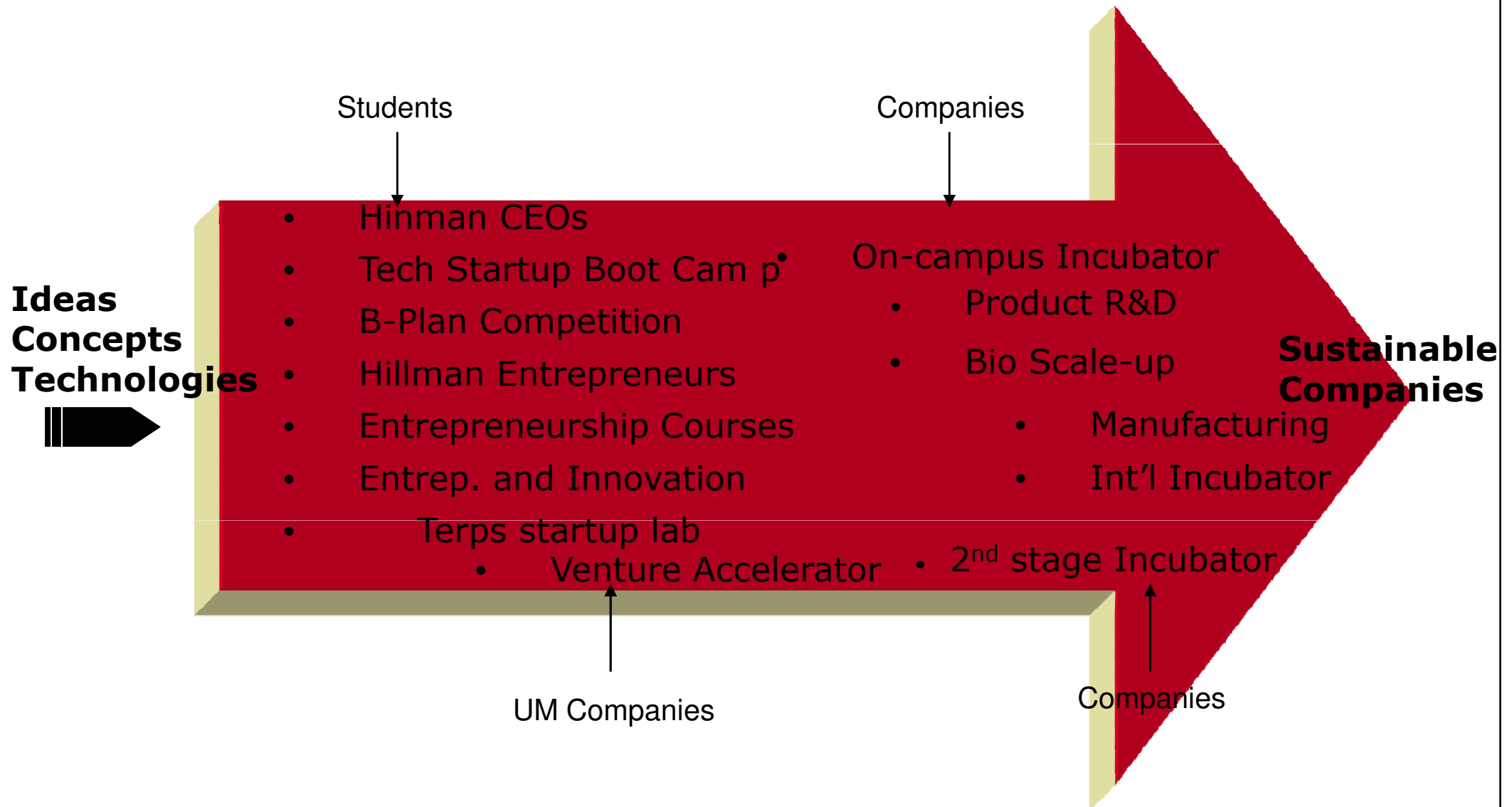
## Ventures

- TERPS Startup Lab
- VentureAccelerator (VA)
- On-campus Incubator (TAP)
- 2<sup>nd</sup> Stage Incubator (TVB)

## Education

- Hinman CEOs
- Hillman Entrepreneurs
- Entrepreneurship courses
- Tech Startup Boot camp
- Business Plan Competition
- Entrepreneurship and Innovation (EIP)

## Mtech Major Program Continuum



# Mtech Impact

- 500 students enrolled in Mtech entrepreneurship courses in 2008
  - + 451 students attended Tech Startup Boot Camp
  - + 150 students signed up for entrepreneur office hours
- \$19.6B Cumulative Economic Development Impact since 1987
- 3,417 jobs created and retained since 1984
- 80 companies graduated from incubator
- 244 companies served by Mtech programs in 2008

# Quality Indicators

- 5 national awards since 2002
- 18 universities have replicated the Hinman CEOs model
- Tech Startup Boot Camp
  - Model for NCIIA's I2V national program
- Universities benchmark against Mtech programs



## **Mtech Major Program Timeline:1984 - 1998**

- 1984 Mtech established (under a different name)  
Original programs:  
    Manufacturing Extension  
    On-campus Incubator (in temporary buildings)
- 1987 Product R&D Program (Maryland Industrial Partnerships – MIPS)
- 1998 New Incubator Building

## Mtech Major Program Timeline: 2000 - 2010

- 2000 Hinman CEOs
- 2001 Technology Startup Boot Camp  
Business Plan Competition
- 2002 First Technology Entrepreneurship Course in Engineering
- 2005 Entrepreneurship course for High School Students
- 2006 Venture Accelerator  
Second Stage Incubator
- 2007 Entrepreneurship course for Freshman Students  
Hillman Entrepreneurs Program  
Entrepreneurship course for Technical Graduate Students  
Executive Education – Innovation Management with Business School
- 2008 Entrepreneur Office Hours  
4-Course Certificate in Technology Ventures and Innovation for Working Professionals  
Corporate Entrepreneurship and Innovation distance course for Petroleum Institute in Abu Dhabi  
Executive Education for Working Professionals
- 2009 International Incubator  
Product Development Course for High School Students
- 2010 Entrepreneurship and Innovation Residential Program for Freshman and Sophomores



# *Mtech Partnerships Major Programs*

## *Leveraging University Innovation to Strengthen Maryland Companies*

### **Programs**

**Maryland Industrial Partnerships Program (MIPS):** R&D develop new and improved products for Maryland companies

**Maryland Manufacturing Partnerships (MMP):** manufacturing solutions for Maryland companies

**Bioprocess Research and Education Program (BREP) :** bioprocess scale-up, technical assistance, and training

**Maryland International Incubator (MI2):** collaboration of Maryland companies, UMD faculty and students with international companies

# **MIPS**

## Maryland Industrial Partnerships

## ***MIPS: What is it?***

The Maryland Industrial Partnerships program (MIPS) helps Maryland companies develop new and improved products by co-funding projects carried out at the University by faculty and graduate students.



# Maryland Industrial Partnerships

- MIPS is a \$1.675 M fund for academic-industrial R&D
- Projects are carried out at the university by faculty and students for companies
- Projects are jointly funded by companies and MIPS
- Disciplines: Engineering, and computer, physical, life and environmental sciences
- Scientific/technical evaluation
- Business/economic review

# ***HughesNet (internet via satellite)***

## **Hughes Network Systems, Germantown, MD**



- **HughesNet is the world's leading broadband by satellite service.**
- **More than \$6.3 B in sales to customers in 85 countries.**
- **System based on design by Dr. John Baras, Professor of Electrical and Computer Engineering at UM College Park, who worked out protocols for how Internet is delivered by satellite worldwide**
- **PI: Dr. John Baras**

# **MMP**

## Maryland Manufacturing Partnerships

# Maryland Manufacturing Partnerships

- MMP is partially funded by the federal and state
- MMP's Mission is Twofold:
  1. Apply Clark School of Engineering resources to benefit Maryland manufacturers.
  2. Strengthen the competitiveness of Maryland manufacturers by providing information, decision support, and implementation assistance.

# MMP Services

- Lean manufacturing/productivity
  - Lean training
  - Process and Plant layout
- Sustainability/Environmental:
  - Pollution prevention assessments
  - ISO 14000 (Environmental Management Compliance)
- Energy Services
  - Energy assessments
  - Education



## MMP Services (cont'd)

- Strategic growth services
  - Top line growth services
  - ISO 9000 (Quality Management)
  - Export assistance
- Engineering and R&D: Technical Solutions
  - Product/process improvement
  - Design for manufacturability
  - Automation
  - Failure analysis
  - Design reviews
  - Compliance with federal and state environmental laws

# Maryland Manufacturing Partnerships

- MMP Impacts = \$288 M assisting Maryland manufacturers (2000-2008):
  - Increased and Retain Sales
  - Cost savings
  - Jobs Creation/Retention

# **BREP**

## Biotechnology Research and Education Program

# Bioprocess Research and Education Program

- BREP's Mission:
  1. Research: Provide a core bioprocessing facility for University of Maryland research faculty
  2. Education: Enhance workforce development in bioprocessing for the academic and industrial communities
  3. Contract Services: Strengthen the competitiveness of Maryland biotechnology companies by providing cost effective bioprocessing facilities and expertise

# Bioprocess Research and Education Program

- BREP's successes:
  - Education: coursework and training programs for University of Maryland and local industry
  - Workforce: More than 50 students have worked in this facility
  - Research: supports faculty research in bioprocessing
  - Contract Services: has worked with more than 60 local bioscience firms in the past 20 years



## **The Maryland International Incubator (MI<sup>2</sup>)**

- Partnership between the University of Maryland and the MD Department of Business and Economic Development
- Mission - to help international, technology-based companies establish operations at the incubator to successfully enter the U.S. marketplace and collaborate with Maryland companies and UMD faculty and students



## **Mtech Ventures Major Programs**

- TERP Startup Lab (TERPS Lab)
- VentureAccelerator (VA)
- TAP Incubator
- 2<sup>nd</sup> Stage Incubator

# TERP Startup Lab

## Tech Entrepreneur Research & Prototyping Startup Lab

- Who: UMD student and faculty entrepreneurs
  - Very early stage companies - Biz Plan Competition, Hinman CEOs and Hillman students, and others
  - Lifestyle company opportunities
- What: A new technology incubation program
  - A place where they can quickly develop their technology prototypes and get some help to start their companies
- Why:
  - Strengthens entrepreneurial community and shared networking/learning among participants in this and other Mtech venture programs
  - Provides additional opportunities for UMD students to gain internships and employment opportunities at UMD startups



# VentureAccelerator



**Research &  
Innovations**



**Business Knowledge Gap  
Funding Gap  
Management Gap  
Infrastructure Gap**



**Successful  
New Ventures**

# VentureAccelerator

- Campus wide participation – faculty and students
- Selects technologies and launches companies
- Rigorous selection process
- Inventor participation can vary from active to consultative
- Brings company-building to the source of innovation
- UM receives equity and deferred fees
- Simplified, single contract acceptable to investors/partners

# The VentureAccelerator Process



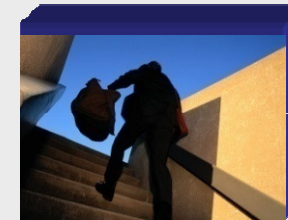
## Selection

- Unique IP
- Scalable market opportunity
- Feasible to assemble human and financial resources
- Extensive due diligence



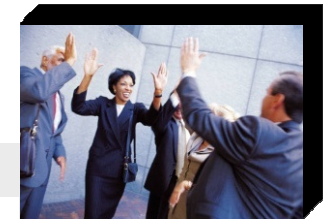
## Planning

- Product planning
- Customer research
- Competitive analyses
- Significant hurdles & risks mitigated
- Financial model & funding requirements
- Completed business plan and presentation



## Execution

- CEO recruiting; team build-out
- Advisors and experts
- Angel & grant fundraising
- Product launch; alphas and betas
- Prepare to disengage



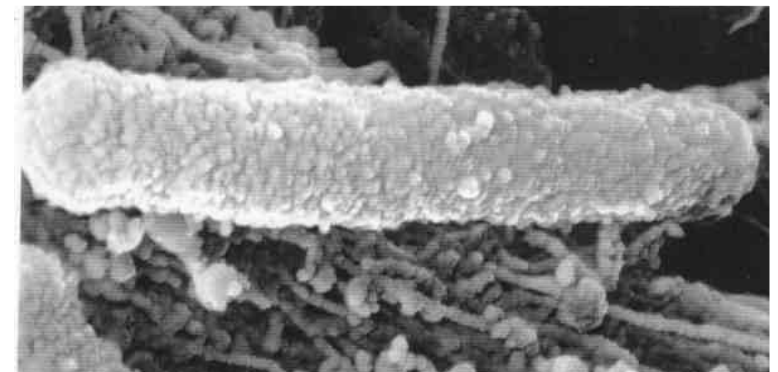
## Scalable Early Stage Company

6-24 months



# VentureAccelerator Graduate Example

## Zymetis





# Technology Advancement Program (TAP) Incubator

- State's first technology business incubator, est. 1985
- Staff of seasoned veterans of startups and VC firms who provide:
  - business advice and support
  - market intelligence
  - introductions
  - access to funding
  - other critical assistance that can accelerate the growth of your technology venture.
- Multitude of other benefits and services associated with being situated right on the campus of one of the nation's top research universities.



# TAP Incubator: Program Details

- Houses between 8 and 12 tech-based startup companies from throughout the DC/Baltimore region
- Companies typically stay for 2-4 years
- 24,000 sq ft of furnished offices, flex lab space, common areas
- Selection process
  - Executive summary
  - Technical due diligence
  - Business/financial due diligence
  - Business review panel
- UM receives equity, fees, and deferred compensation

## TAP Successes



IPO (NASDAQ: MATK)

\$1+ billion market cap

Acquired for \$1.6 billion by  
QIAGEN (NASDAQ: QGEN)

Acquired for \$30 million

Powerize.com acquired for  
\$17 million by Hoovers

# VentureAccelerator vs. TAP: Key Differences

	VA	TAP
Eligibility	Current UMD-affiliation required	UMD <u>and</u> regional entrepreneurs
Mtech role	Active role: part-time, interim CEO	Advisory role: mentor, sounding board
Location	Anywhere	TAP building
Term	6-18 months	24-48 months
Terms	1-3% equity/quarter Deferred service fees	1% equity/year Below market office/lab rates

## 2<sup>nd</sup> State Incubator -Tech Ventures Building (TVB)

- 35,000 square foot building
- Located on edge of campus and research park
- Space for lease to tech companies
- Occupied by incubator graduates and other tech companies interested in being close to the University
- Current companies
  - DataStream – TAP graduate, data conversion
  - TRAFFAX – VentureAccelerator company, traffic monitoring
  - MXF – enhanced x-ray techniques, class 100 clean room
  - Maxion – spinoff of Army Research Lab, infrared lasers
  - Enterprise Sciences – optical, plasma and laser sciences



# Ventures Track Record

- Over 80 graduates from TAP
  - 65% maintain material operations 5 years later
  - 80% remain in Maryland
- Close to \$300 million in Venture funding
- ~ 2,000 jobs; mostly technology-oriented
- 2 IPOs, each over \$1 billion
- Multiple M&A's

# **Entrepreneurship Education Major Programs**

- Objectives
- Evolution of programs and activities
- Historic initiatives
- New initiatives

# Educating Entrepreneurs

*With special attention to Technology Entrepreneurs*

- Educate the next generation of entrepreneurs
- Entrepreneurship education programs designed to help students (and faculty) to understand and practice entrepreneurship successfully
  - Stimulate entrepreneurial thinking among students, faculty, and the broader community
  - Generate deal-flow for Mtech's venture creation initiatives



## Non-classroom Education

- Annual Technology Startup Boot Camp
  - Near the beginning of the academic Year
  - 9<sup>th</sup> annual in 2009
  - Speakers & panels on marketing, business plans, intellectual property, raising capital, legal formation, etc.
  - Targeted at both U-Md. faculty, students, and researchers as well as regional entrepreneurs and venture community
  - Attracts ~ 500 attendees
- Entrepreneurial Office Hours – monthly
- Annual Business Plan Competition
  - Near the end of the academic year
  - (9<sup>th</sup> annual – May, 2009)
  - \$75K in prizes
  - Attracts 50-100 entries

Tseai  
Energy  
Unlimited



# Cornerstone Undergraduate Programs

*Donor funded by Brian Hinman & David Hillman*

- Hinman CEOs Program
  - Nation's 1st living-learning entrepreneurship program placing approximately 90 top undergraduate students from all disciplines together to experience new venturing
    - Avg. GPA 3.5, 20% double-major, 12% study abroad
  - Record levels of applicants, companies, and student success and satisfaction. 30% acceptance rate.
  - 18 replications of our model at universities
- Hillman Entrepreneurs Program
  - New educational initiative tailored to the needs of transfer students who begin their study at Prince George's Community College and complete their bachelor degree at University of Maryland



# Coaching & Mentoring for Hinman CEOs/Hillman Entrepreneurs/EIP

- On-site business coaching & personal mentoring
  - Directors with entrepreneurial experiences, doctorates, research experience, etc.
  - Faculty throughout the University
  - Fellow students
- Off-site mentors
  - Alumni of the Programs
  - Entrepreneurs
  - Venture capitalists
  - Attorneys
  - Others



# Student Ventures of Hinman CEOs

**Lurn, Inc.** Provider of affiliate marketing training



**Squarespace** is a simple web publishing platform offering professional presentation of web content through a dynamic, easy-to-use interface.



**Zathyus Networks** is a provider of remotely hosted message boards currently ranked among the top 200 most trafficked websites with over 32 million registered users.

All student companies are 100% student-owned, with no equity sharing with the University and no fee for participation in the programs

Motivates and inspires students to launch their ventures as undergraduates (and give back as alumni)

Typically 25% of Hinman CEOs students manage their own revenue-generating venture during their time in the program



## Education Activities by Audience

<b>High School Juniors &amp; Seniors</b>	<ul style="list-style-type: none"> <li>• Young Scholars Summer Program (UM) <ul style="list-style-type: none"> <li>– ENES140: Discovering New Ventures</li> <li>– ENES141: Technology Marketing &amp; Product Development</li> </ul> </li> <li>• Young Scholars Spring Program (H.S. campuses)</li> </ul>	<u>Non-Classroom Activities</u> <ul style="list-style-type: none"> <li>• Technology Startup Boot Camp</li> <li>• \$75K Business Plan Competition</li> <li>• Mtech Entrepreneur Office Hours</li> </ul>
<b>Freshmen</b>	<ul style="list-style-type: none"> <li>• ENES210: Entrepreneurial Opportunity Analysis</li> </ul>	
<b>Freshmen &amp; Sophomores</b>	<ul style="list-style-type: none"> <li>• Entrepreneurship &amp; Innovation Program (to begin in Fall, 2010)</li> </ul>	
<b>Juniors &amp; Seniors</b>	<ul style="list-style-type: none"> <li>• Hinman CEOs Program: 4 Courses</li> <li>• Hillman Entrepreneurs Program: 4 Courses</li> <li>• ENES460: Fundamentals of Technology Startup Ventures</li> <li>• Several Other Technology Entrepreneurship Courses</li> </ul>	
<b>Graduate Students</b>	<ul style="list-style-type: none"> <li>• BIO645 – Advanced Engineering Startup Ventures</li> </ul>	
<b>Professionals</b>	<ul style="list-style-type: none"> <li>• Graduate Certificate in Technology Ventures &amp; Innovation - 4 courses</li> <li>• Executive Education in Innovation Management <ul style="list-style-type: none"> <li>– 5 one-day courses</li> </ul> </li> </ul>	



# Entrepreneurship & Innovation Program

*New Honors College Program Launching in Fall 2010*

- New living-learning program in the Honors College
  - Approved in Fall 2009 and launching in 2010 as one of the cornerstone programs in the University's new Honors College
  - Serving 150 students across two cohorts of 75 students
  - Adapting the Hinman CEOs model for Jr/Sr to a Fr/So audience
  - Independent program from Hinman CEOs
- Key program aspects for the two-year experience
  - Living community with all students living together near program director's office and incubator-style resources
  - Experiential learning via courses, seminars, workshops, competitions, volunteerism, and startup companies
  - Challenging academics with four Honors courses (1 course/semester)
  - On-demand coaching and mentoring for students
  - Seed funding for student ventures



## ***Web Site and Contact***

**301- 405- 3906**

- **Mtech: [www.mtech.umd.edu](http://www.mtech.umd.edu) with links to other Mtech programs**



**Dziekuje!**