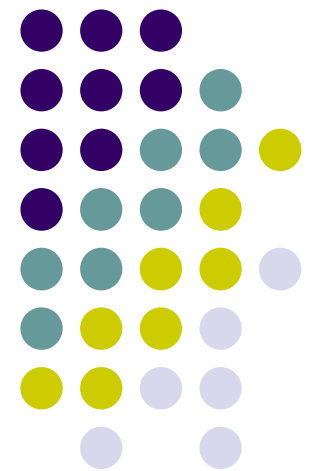
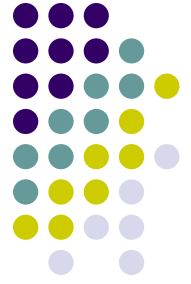


Fostering Bioscience Entrepreneurship in the Dallas-Ft. Worth Metro Area

David L. Deeds
Academic Director
The Institute for Innovation &
Entrepreneurship at UTD





Agenda

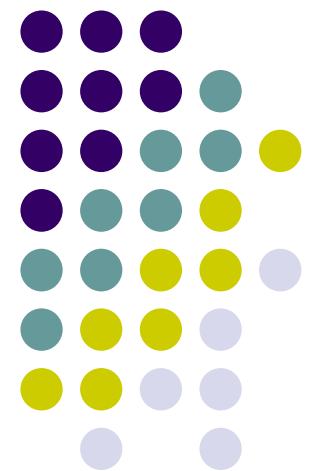
- The Institute for Innovation & Entrepreneurship at UTD
- Location, Location, Location
- Lessons from 30 years of Bioscience Entrepreneurship for Bioscience Entrepreneurs

The Institute for Innovation and Entrepreneurship at UTD

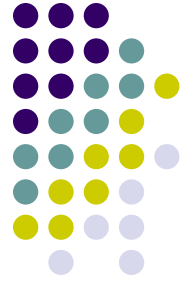
*Leveraging the power of ideas and
technology to create new ventures and
add economic, social and cultural value
to our community*

innovation@utdallas.edu

<http://innovation.utdallas.edu>



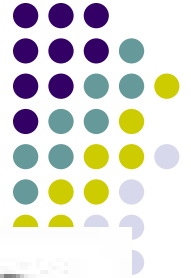
Objectives



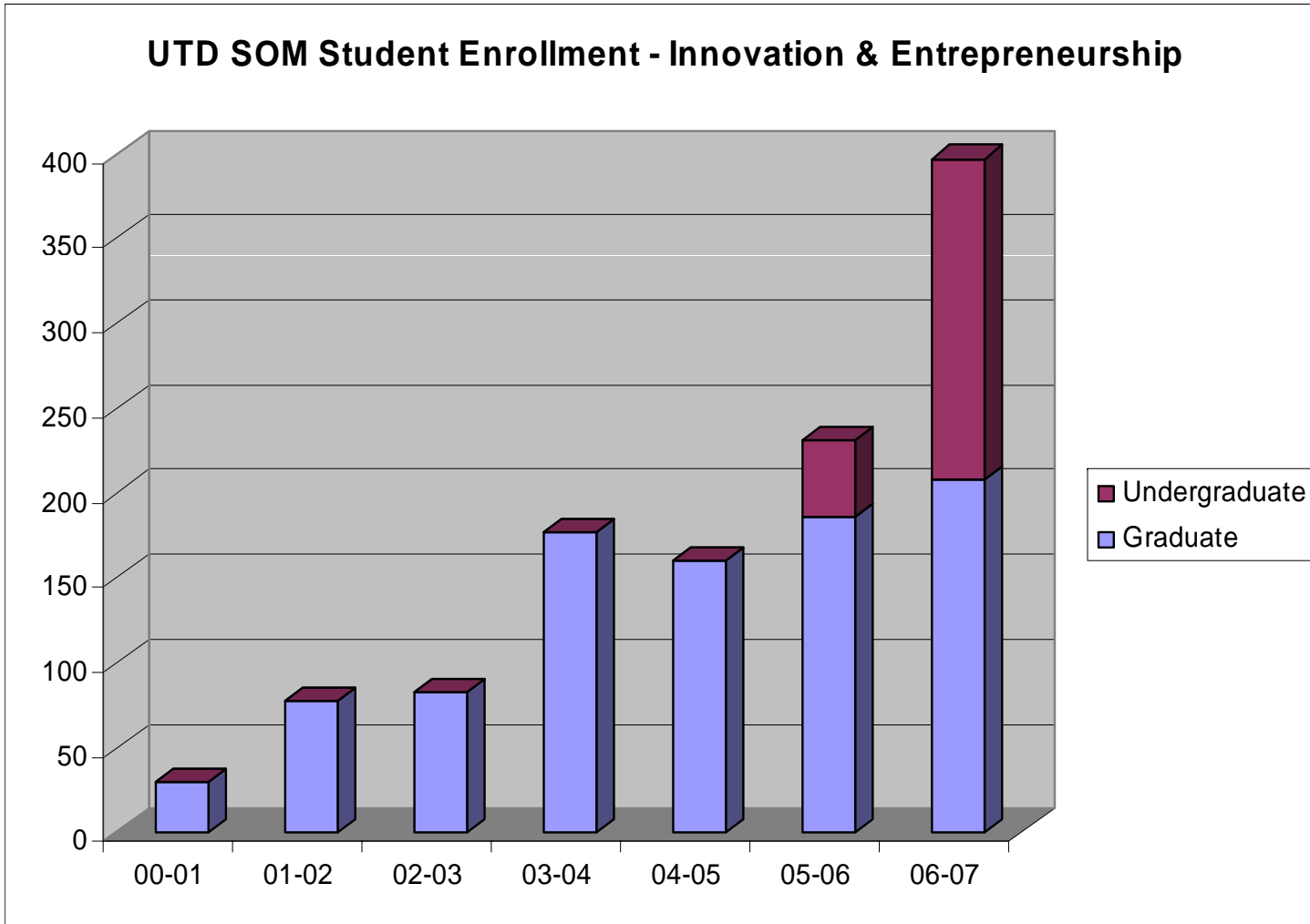
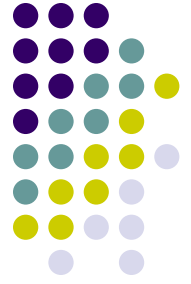
- **Support the positioning of UTD as an institution recognized not only for research leadership, but also for the positive impact it has on its region and society through the innovative application of new knowledge**
- **Develop nationally recognized academic programs and preparing our students to succeed in today's entrepreneurial economy.**
- **Foster the development of an entrepreneurial mindset across the university**
- **Proactively engage the community and the marketplace in ways that further the sharing of knowledge and the commercialization of our technologies.**

Academic Programs

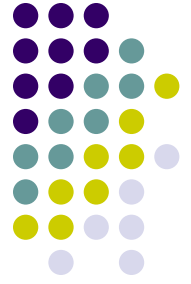
- **Develop nationally recognized programs and preparing students to succeed in today's entrepreneurial economy.**
 - **Graduate Programs**
 - 11 Courses in School of Management; 2 in Economics
 - Concentration in Innovation & Entrepreneurship (MBA/MS)
 - **Undergraduate Programs**
 - 3 courses in School of Management ; 2 in Economics
 - Concentration in Innovation & Entrepreneurship (BA)
 - Minor in Innovation & Entrepreneurship
 - **Cross-disciplinary programs**
 - Arts & Technology Program
 - MS in Biotechnology
 - MSEE/MBA
 - MD/MBA



Student Interest and Enrollments are Growing

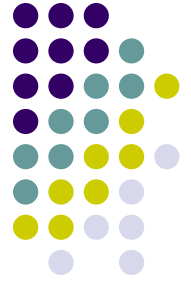


Programs to Engage Faculty and Students & Encourage an Entrepreneurial Mindset



- **Entrepreneurship & Commercialization Boot Camp**
- **Third Thursday Brown Bag**
- **Launch Pad Program**
- **Individualized Consultation for Faculty Entrepreneurs**

Programs for Community Outreach

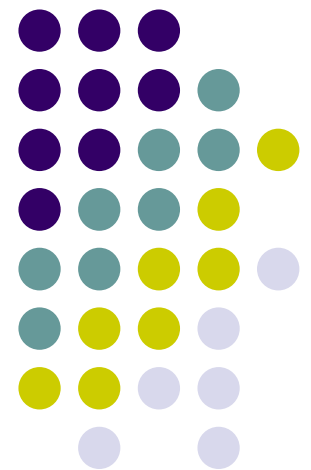


- **Entrepreneurial Development Series**
- **Quarterly Research & New Venture Showcase**
- **North Texas High School Business Plan Competition**
- **UT Inventors & Entrepreneurs Awards Luncheon**

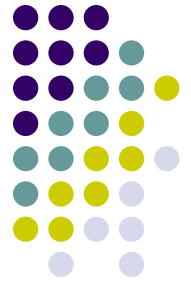


Fostering Bioscience Entrepreneurship: Lessons From 30+ years of Biotechnology

David L. Deeds
Academic Director
The Institute for Innovation &
Entrepreneurship @ UTD



Distinctive Characteristics of Bioscience Entrepreneurship



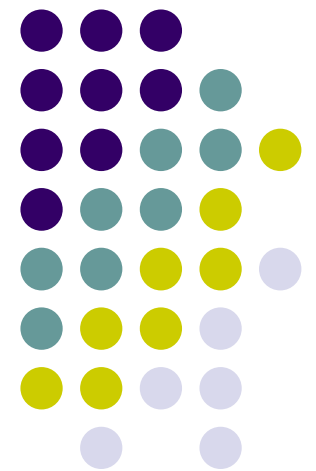
- Science driven – Academic research is driving the industry
- A large cluster of techniques, skills, processes, etc. fit under the umbrella
- A large number of markets, products and even services will be affected by the technology – there is no SIC/NAIC code that captures BioScience

Distinctive Characteristics of Bioscience Entrepreneurship

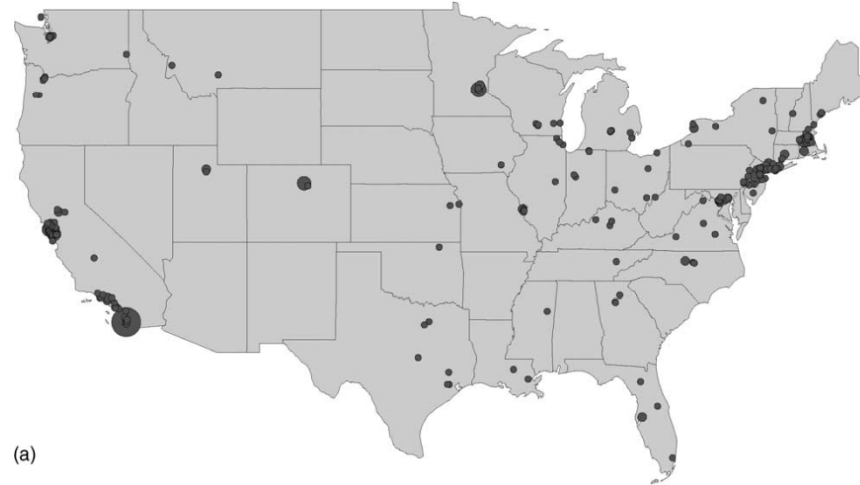
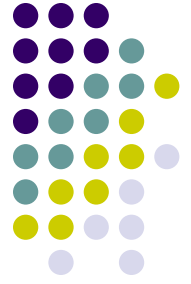


- There exists a high degree of means-end uncertainty
 - We're not sure what we're going to do with it quite yet
 - We're not sure how its going to work
 - We're not sure the ends we can achieve
- Long, expensive and highly regulated product development cycle which will require big hits and numerous investors and partners

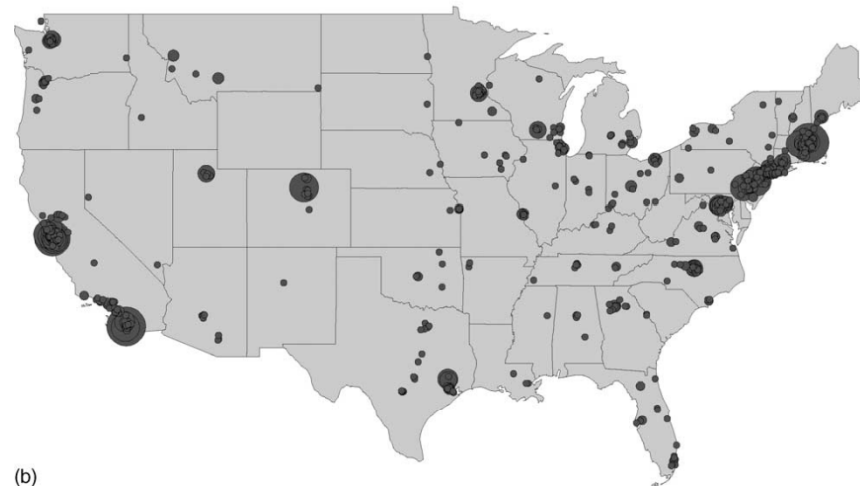
Location, Location, Location



Distribution of biotechnology companies in (a) 1983 and (b) 1995

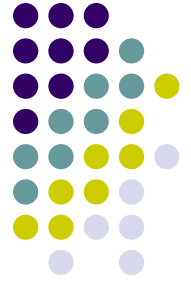


(a)



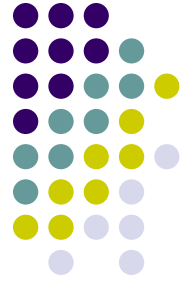
(b)

Source: Sorensen & Stuart, 2003



Location, Location, Location

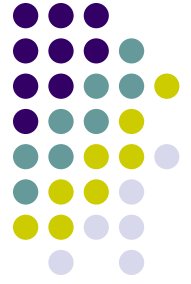
- Geographic Clusters provide substantial benefits including:
 - Labor Pooling
 - Specialized Suppliers
 - Lawyers
 - Investors
 - Specialized Assets (Machinery, etc.) and Inputs
 - Knowledge Spillovers



Location, Location, Location

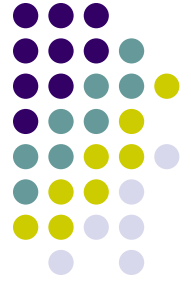
- Enhanced outcomes from being located in a geographic cluster
 - Higher Probability of IPO
 - Higher Value at IPO
 - More attractive to partners
 - Higher survival rate
- Clusters in Science Driven Industries have at least 1 Great Research Institution at their Heart

What fosters a Bioscience Cluster?



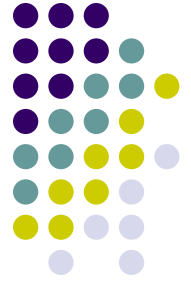
- The Three V's
 - Volume of activity in the region
 - Visibility of activity in the region and beyond
 - Velocity of the regions intellectual capital

What fosters a Bioscience Cluster?



- Volume of activity in the region
 - Scientific research
 - Investment capital
 - Skilled entrepreneurs
 - Supporting infrastructure

What fosters a Bioscience Cluster?



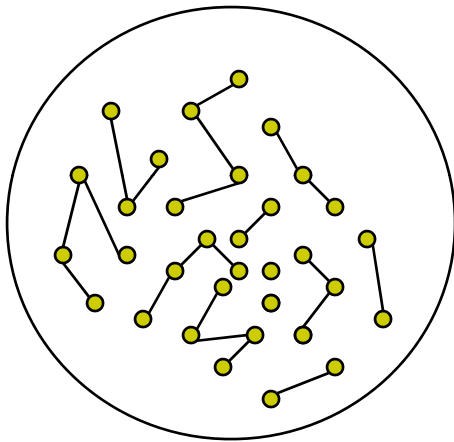
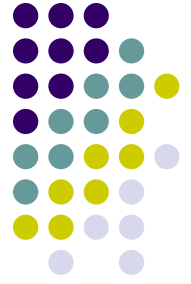
- Visibility of activity in the region & beyond
 - Media coverage
 - Success stories and striving, even struggling ventures have to be seen as valued and valuable pursuits
 - High profile successes
 - Engagement of entrepreneurs in the local social, economic and political networks

What fosters a Bioscience Cluster?

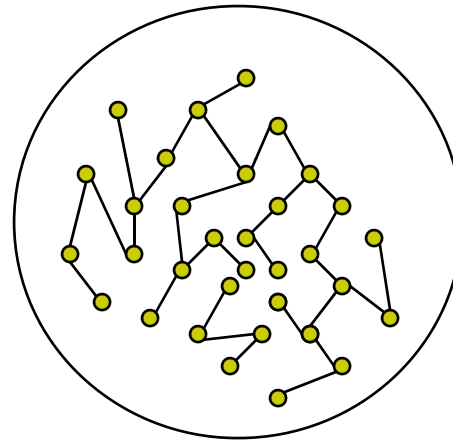


- Velocity of the region's intellectual capital
 - Innovation is about novelty and novelty occurs through ideas bumping into each other
 - The faster ideas move the more they bump into each other
 - Organizational boundaries and fragmented social networks inhibit the velocity of a region's intellectual capital

Simple Graphics of Fragmented vs. 'Perked' Networks



Fragmented
Network

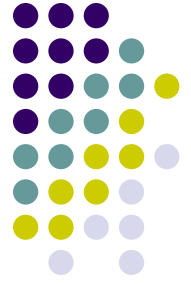


'Perked' Network

In a 'perked' network information flows

**In a fragmented network remains trapped
in small pools**

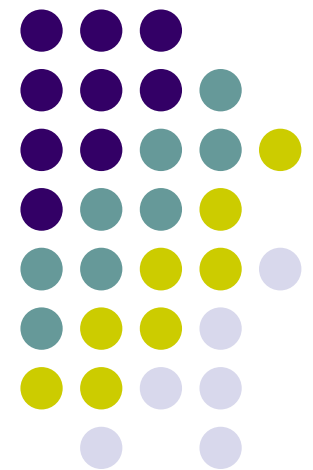
Keys to Innovation & Entrepreneurship in Bioscience



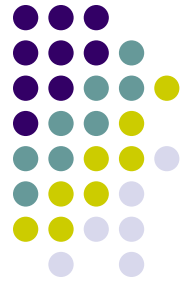
- Volume
 - Research and scientific discovery *
 - Key strategic alliance partners*
 - Investors with appropriate domain knowledge*
 - Entrepreneurs – to take the best ideas and run with them*
- Visibility
 - Big, Visible wins*
 - Media coverage*
 - Entrepreneurs involvement in the community
- Velocity
 - Mechanisms for the efficient transfer of knowledge and intellectual property*
 - Interdisciplinary cooperation*
 - ‘perked’ social networks

**Creating a Biotechnology Cluster in the Dallas Region –
D.A.Hicks, Ph.D. 2005*

So what are the lesson for Bioscience ventures from 30+ years of BioScience entrepreneurship?

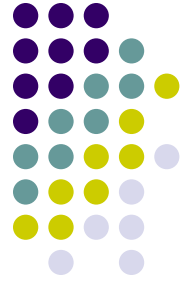


Lesson #1: Profit & wealth will be created when the product delivers value to the consumers!



- Product companies are the big wins
- Enabling technologies (technologies that allow you to make, do, process, etc.) do not create big wins unless they translate into a breakthrough consumer technology
- Selling stuff to each other moves the money but doesn't create a vibrant, growing and sustainable industry.
- It is only when the technology creates real value for end users that sustainable revenues are generated and sustainable wealth is created

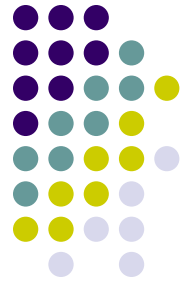
Lesson #1: Profit & wealth will be created when the product delivers value to the consumers!



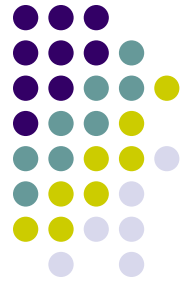
Biotech Billion Dollar Drugs Ranked by 2004 Revenue*

Drug	Company	2004 Sales (\$M)
Epogen	Amgen	\$2,601
Aranesp	Amgen	\$2,473
Rituxan	Genentech and Biogen	\$2,326
Enbrel	Amgen	\$1,900
Neulasta	Amgen	\$1,740
Avonex	Biogen	\$1,417
Neupogen	Amgen	\$1,175
Rebif	Serono	\$1,091

Lesson #2: Prepare for a bumpy ride



Lesson #2: Prepare for a bumpy ride



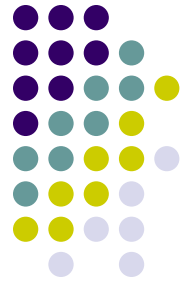
- The industry and segments within the industry will fall in and out of favor with the investing community.
 - These swings are not infrequent and the shift happens rapidly.
- Your ability to raise capital depends on the successes and failures of the other firms operating in your market.
 - This is a particularly strong influence in the early stages of an industry/technology segment
- Bad Actors and Bad acts hurt everyone in the industry
- Be ready to strike when the market is hot
- Be prepared for the long cold winters

Lesson #3: You can't go it alone



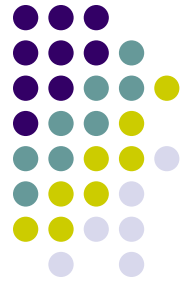
- Big partners are generally a necessary evil
 - They may not be malicious but they are out to maximize their profit and strategic position not incubate your company
- Research Institutions march to a different drummer, but those ventures that learn to work with them benefit from the relationship
 - Leading-edge Knowledge
 - Skilled work force
 - Legitimacy
 - Access to specific assets
- Partnering with other 'ventures' can be beneficial, but does pose a risk of enabling competitors

Lesson #4: Know the rules of ‘Public Science’



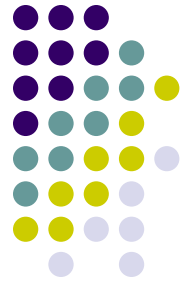
- Research is primarily focused on the discovery of new knowledge
- Innovation is the process by which new knowledge is applied to create commercial value
- Entrepreneurship is primarily focused on the innovation process
 - An orientation, a mindset, a set of disciplines
 - Motivated by the expectation of gain
 - Domain knowledge is essential, but the basic process elements are broadly applicable across multiple domains
 - Innovation comes from linking new knowledge/technology to what buyers value – and assembling the skills and resources to “make it happen”

Lesson #4: Know the rules of 'Public Science'



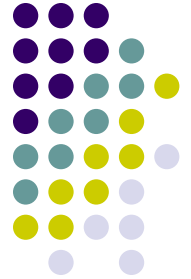
- The Values of Public Science
 - Primary goal – discovery/creation and dissemination of new knowledge that enhances/expands our understanding of the world
 - Secondary goal – Improve the lives of the people of the world
 - Reward structure
 - Publication
 - Priority
 - Citation
- We (Academics) Succeed by Being the First to Publish Interesting New Findings in Top Tier Academic Journals That Inspire Others in the Field to Build on Our Work
- Status in 'Public Science' is conferred by sharing – you have to present and publish to be a player and players get stature which provides access to knowledge and skilled researchers

Lesson #4: Know the rules of 'Public Science'



- Culture and incentives are not aligned – researchers and entrepreneurs live in different worlds:
 - Different rules (open-sharing through publication vs. proprietary secrets)
 - Different norms (collaboration vs. competition)
 - Different reward structures (peer recognition vs. economic return)
 - Different time horizons (patient, methodical – measured in years vs. pressured, driven – measured in months)

Contact Us



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