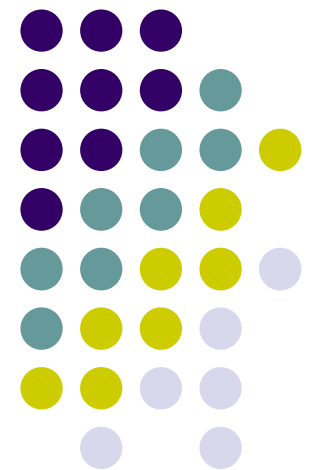
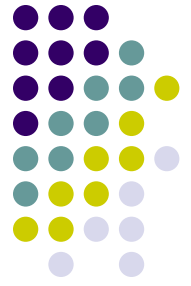


Lessons From 30 years of Biotech Entrepreneurship For Nanotech Entrepreneurs

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

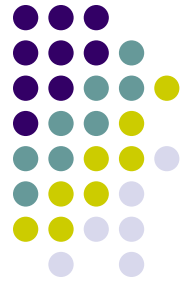


Similarities between Biotech & Nanotech



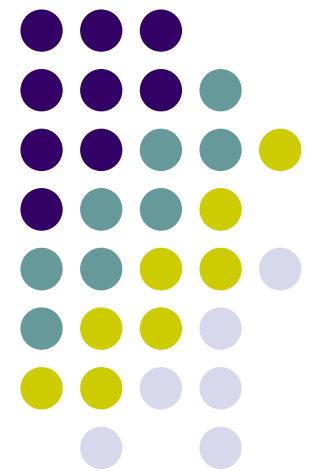
- Science driven – Academic research is driving the industry
- A large cluster of techniques, skills, processes, etc. fit under the umbrella
- A large number of markets, products and even services will be affected by the technology – there is no SIC/NAIC code that captures Biotech or Nanotech

Similarities between Biotech & Nanotech



- 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
 - We're not sure how we are going to manufacture it
- Long and expensive product development cycle which will require big hits, lots of investors and partners
- The potential for serious challenges to the legitimacy of the industry

So what do we know after 30 years of Biotech entrepreneurship?



Lesson #1: Profit & wealth will be created when then 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

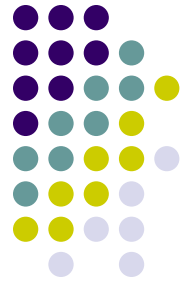
Lesson #1: Profit & wealth will be created when the product delivers value to the consumers!



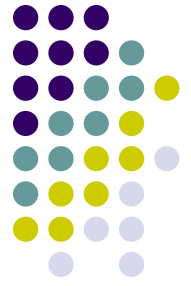
Biotech Billion Dollar Drugs Ranked by 2004 Revenue*

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



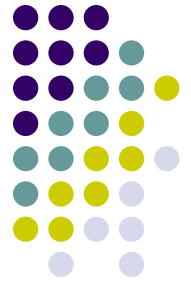
- The industry and segments within the industry will fall in and out of favor with the investing community.
 - These swings are not infrequent and the shift happens rapidly.
- Your ability to raise capital depends on the successes and failures of the other firms operating in your market.
 - This is a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

Lesson #3: You can't go it alone



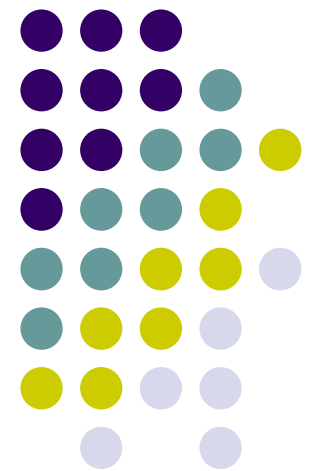
- Big partners are generally a necessary evil
 - They may not be malicious but they are out to maximize their profit and strategic position not incubate your company
- Research Institutions march to a different drummer, but those ventures that learn to work with them benefit from the relationship
 - 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'

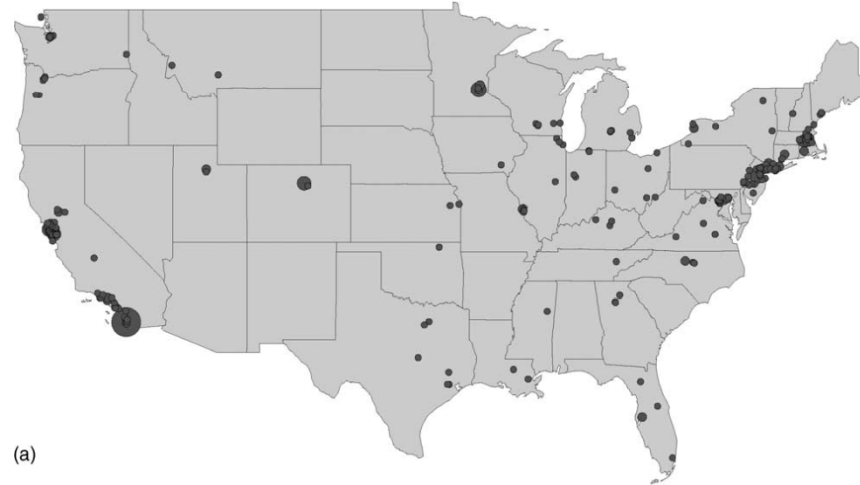


- The Values of Public Science
 - Primary goal – discovery/creation and dissemination of new knowledge that enhances/expands our understanding of the world
 - Secondary goal – Improve the lives of the people of the world
 - Reward structure
 - Publication
 - Priority
 - Citation
- We (Academics) Succeed 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 and access to new knowledge and higher skilled researchers

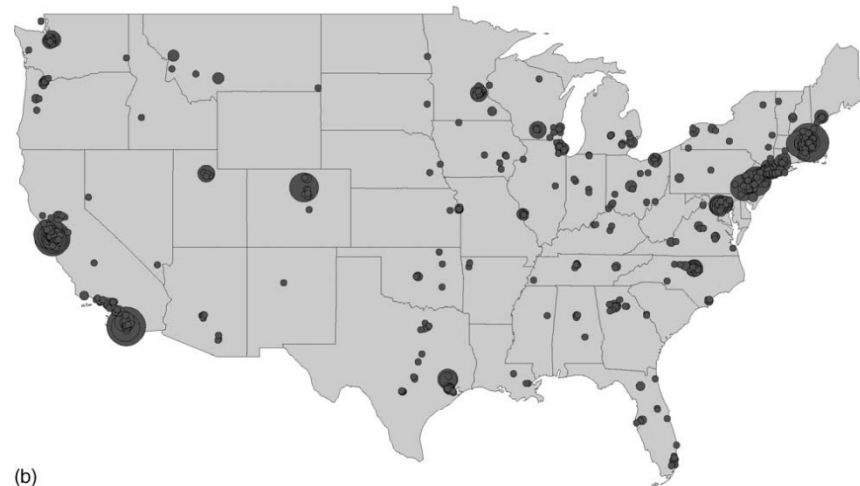
Lesson #5: Location, Location, Location



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



(a)



(b)

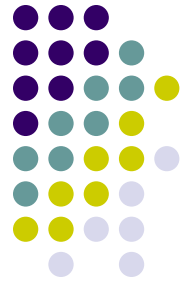
Source: Sorensen & Stuart, 2003

Lesson #5: Location, Location, Location



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

Lesson #5: 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