Careers in the Biotechnology Industry

Or

What Do I Want To Be When I Grow Up?

Or

An Unabashed Pitch for Biotechnology

Or

A Random Walk Through One’s Career Thoughts

Mark W. Schwartz, Ph.D.
Agenda

- The Biotechnology Industry
- Careers in the Life Sciences
- Capital Flow (just a little bit)
- Career “Decision Tree”
- Job Titles
- Life of a CEO
- Send off
Mark W. Schwartz, Ph.D.

30+ Years in the biotech industry

- duPont – diagnostics & research products
- ABI* – research instrumentation
- Biosym* – protein modeling software
- Tripos – Drug design software; combinatorial chemistry and drug discovery
- Synteni*/Incyte – Gene expression microarrays
- Argonaut – Instrumentation
- Trega*/Lion – Therapeutics and ADME software
- Calyx% – Diabetes and RA small molecule therapeutics
- AzTE – Technology transfer and economic development, Arizona State University
- Bayhill% – DNA based therapeutics for autoimmune disease
- Apthera** (restart) – NeuVax - Breast cancer therapeutic
- Galena Biopharma%* (RXi Pharmaceuticals) – NeuVax
- New American Health – Co-Founder(Health Insurance)

- Targzyme- Board of Directors
- Adjunct Faculty, MBT, San Jose St. Un.
- Advisor/Consulting
  - Clipius Technologies
  - NeoLight
  - Genteract
  - CEI, Biotech Incubator, Phoenix

Past Affiliations

- Biotechnology Industry Association (BIO)
  - Board of Directors
  - Emerging Cos. Board
  - Health Section Board

- CalBio
  - Advisory Board

- Ph.D. Biochemistry
  - Arizona State University, 1982

%CEO
*Company Acquired
Biotechnology Industry
Original Definition of Biotechnology Company

- Developing biological molecules as drugs

- Term now is used more generally for any small start up/company in the life science space
Biotechnology Market Segments

- Therapeutics
- Technologies
- Devices
- Diagnostics
Therapeutics - Miners

- Rx drugs
- Small molecule
- Natural products
- Antibodies
- Bio-engineered proteins
- Peptides
- Oral
- Injectable
- Stem cells
- Cell therapies
- CART-T cells
- Galena Biopharma
- Genentech
- Amgen
- Biogen
- Pain Therapeutics
- BioMarin
- Juno
- Lilly, Merck, Pfizer, etc.
- .............
Technology Companies – Picks and Shovels

- Robotics
- Software
- Instrumentation
- Combinatorial chemistry
- Genomics
- Things
- Services

- Illumina
- Tripos
- Agilent
- Odessey
- Quantum Dot
- .................
Device Companies

- Stents
- Catheters
- Surgical Devices
- Implantable pumps
- Implantable radiation devices

- Medtronics
- Boston Scientific
- Bard
- Intuitive Surgical
- J&J
- Gammatile
Diagnostic

- Biological system status
- Disease diagnosis
- Molecular diagnostics
- Pharmacogenomics
- Companion diagnostic (Dx paired with Rx)

- Roche Dx
- Boehringer Mannheim
- Becton Dickinson
- Illumina
- Bayer
- 23 & Me (?)

![Test tube image]
Therapeutic Development
Bringing A Drug to Market

- Requires
  - Successful proof
    - Safety
    - Efficacy

- Time
  - 12 years

- Money
  - $800M -> $1BN -> +++
Drug Discovery & Development

$500M - $1BN+

Mattisson DR, Mattison Faye AC Blickpunkt der Mann 2008; 6 (1): 21-25 ©
Capital Flow
Investor Capital – Part of the Grand Cycle

VC's

Insurance companies

Wealthy Individuals

Universities, Charities

Public Pension Funds

Rent, local services

Suppliers, instruments

Your Company

Public Markets

Private investors
Pension Funds
401K Funds
Church Funds
Unions

Clinicians and scientists
Universities

Employees
Opportunities for Scientists
A Ph.D. in Science is......

- Is only a starting point
Scientific Degrees and Careers

BS
Scientific Degrees and Careers

BS

Ph.D.

Lab tech Industry

Lab tech University
Scientific Degrees and Careers

- BS
  - Lab tech University
    - Lab tech Industry
  - Lab tech Industry
  - Ph.D.
    - Commercial Research
      - Research
    - Faculty
      - Research
    - Lab tech Industry
      - Lab tech University
  - Ph.D.
    - Research
      - Commercial Research
        - Research
Scientific Degrees and Careers

- BS
  - Lab tech Industry
  - Lab tech University
- Ph.D.
  - Faculty
  - Commercial Research
    - Management
    - Research
    - Administration
    - Research
Careers in the Life Sciences

BS

- Lab tech Industry
- Lab tech University

Ph.D.

- Commercial
- Research
- Faculty

- Administration
- Research

Product

- Management
- Research

- Product Management
- Sales
- Marketing
Careers in the Life Sciences

BS

Lab tech University

Lab tech Industry

Ph.D.

Faculty

Research

Commercial Research

Management

Administration

Business Development

Strategy, HR, Management

Product

Product Management

Sales

Marketing
Halozyme Jumps on Immuno-Oncology Deal with Bristol-Myers

Pharma giant aims to develop cancer drug delivery technology. Halozyme shares are up more than 16% in pre-market trading.

By William McConnell
Sep 14, 2017 7:00 AM EDT

Bristol-Myers Squibb Company (BMY - Get Report) and Halozyme Therapeutics Inc. (HALO - Get Report) Thursday morning announced a collaboration and license agreement to develop Bristol-Myers Squibb subcutaneously administered immuno-oncology medicines using Halozyme's...
Careers in the Life Sciences

BS

Ph.D.

Faculty

Commercial Research

Research

Management

Investments

Business Development

Strategy, HR, Management

Policy, Regulatory, Legal

Product Management

Product

Lab tech University

Lab tech Industry

Lab tech Industry

Lab tech University
Spectrum of Scientific Related Positions

- Research & Development
  - Classic vision of science job
  - Wide range of research options

- Basic research
  - Learning new things
  - Academic vs industrial research

- Development
  - Refining knowledge to apply to product or process
  - Applying existing knowledge to new applications
  - Clinical development
Product Management/Product Marketing
- Product Definition
- Product Launch
- Product Marketplace

Matching development with market needs
- Knowing science and technology
- Knowing the “customer”
- Knowing manufacturing
- Triangulating all three

Unique set of skills
- Technical
- Marketing
- Influence

Often a path to senior/executive management
Spectrum of Scientific Related Positions
Business Development, Sales

- **Sales/Business Development**
  - High value products
  - Often requires broad knowledge base, broad contact base

- **Sales (selling many copies of the same product/service)**
  - Selling skills are highly valued in many companies/positions
  - Highly emotional/Real time feedback
  - Can be very technical/scientific

- **Business Development (licensing a drug once)**
  - Sophisticated, complex high dollar deals
  - Requires broad and deep technical knowledge, as well as financial acumen
  - Also can be corporate M&A (mergers and acquisitions)

- Often a path to CEO
Spectrum of Scientific Related Positions
Regulatory Affairs

- Regulatory
  - Constrained creativity
  - Structure and government regulations (esp. FDA)
  - Highly skilled to work technical challenges through complex regulations

- Defining exactly how a drug or device will be developed to meet regulatory requirements
  - Strict limitations set by FDA
  - Creativity within defined limits
  - Huge impact on ability to develop new therapeutics

- Requires technical knowledge as well as knowledge of regulations and relationship skills with FDA

- High demand for regulatory people, no degree in Reg Affairs
Spectrum of Scientific Related Positions
Executive Management

- Executive Management
  - Strategic Vision
  - Financial orientation
  - Broad skill set across many areas

- Running a company in all of it glory, ups and downs, successes and failures
  - People management
  - External relations management
  - Mastery of the science
  - Financial fluency/expertise

- Broad set of knowledge and skills required
  - Technical
  - Financial
  - Interpersonal
  - Industry
  - National and world events
  - Political developments
  - Selling skills
Spectrum of Scientific Related Positions
Investment

- **Investment Community**
  - Broad technical knowledge across many areas
  - Financial engineering
  - Mapping of science to financial analysis

- **Investment Banking**
  - Identifying, acquiring and working with clients to raise money and transact M&A (a bit like a VERY expensive real estate agent)

- **Analyst – buy side/sell side**
  - Analyze companies science, products and prospects for success against their financial backdrop

- **Hedge Fund**
  - Analyze companies science, products and prospects for success against their financial backdrop
  - Make buy and sell positions for funds portfolio

- **Venture Fund**
  - Analyze companies science, products and prospects for success against their financial backdrop
  - Make investment decisions for funds
Not Discussed

- Government and think tanks – policy positions

- Granting agencies

- Writers
  - Newspapers
  - Industry rags
  - Medical writers – writing medical/scientific documents

- IR (investor relations)/PR (public relations)
  - Developing footprint of company in various communities
    - Investor community
    - Patient community
    - Physician community
    - Etc.
TAKE HOME:

There are A LOT of things you can do with a Ph.D.!!!
Working in Biotechnology
An Unabashed Pitch for My Industry
Why Work in Industry?

- Tangible outcomes
- Team work
- Job options
  - Research, marketing, management, public affairs, etc.
  - bbq cook at company picnic
- Resources
  - Equipment
  - Support
- Sense of urgency
- Definable goals – unmet medical need
  - Product
  - Shareholders
- Money
Biotechnology

The best opportunity to have the biggest impact

IF

You can stand the risk
Biotech Undertaking

- Start with an undeveloped, unproven idea
- Raise $100M - $250M - $1bn+
- Spend 5-10-15 years working on development
- Chances of success: 
  - 1/100 – 1/50 - 1/10
- Who would do this???
THE Job
You still have a boss (several – BOD)

The stress is palpable (especially when broke)

It can be very lonely

It can be very rewarding:

- **YOU** set the standard
- YOUR influence stretches far, wide and deep
- **YOU** can make a major difference in people’s lives
20 Minutes in the Life of a CEO
20 Minutes in the Life of a CEO

- **10:05AM**
  - Call from board member re: possible collaboration with another portfolio company

- **10:11**
  - V.P. R&D – Results from latest research project

- **10:14**
  - Sr. Scientist Drug Screening – wants different office

- **10:18**
  - VP Clinical Affairs – results of latest clinical trial

- **10:24**
  - Chemistry Technician – toilet is backed up
Considerations
Career Thoughts

- Expectations - What are the trade offs of your life?
  - Location
  - Work-Life Balance
  - Family Commitments
  - You can’t have it all...understand your trade offs and move forward

- What do I want to do every day?
What Do I Want To Do Everyday?

- Work in the lab? Clinic?
- Office environment? Travel?
- Do I like to write? Do I like working with people?
- Project management?
- Work with the FDA? Regulatory Affairs?
- Set government policy?
- Finance, deal making?
- Management?
Career Thoughts

- Expectations - What are the trade offs of your life?
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- What do I want to do every day?

- A career is both
  - The Journey
  - The Destination
Career Management

No Matter What You Do
How to Get Where You Want

- Understand the big picture
  - Know the business, not just your job
  - Ask questions, talk to everyone, esp. other departments
  - Talk to the boss
  - Talk to the boss’s boss

- Learn to speak in public
  - Present whenever possible
    - Large groups
    - Small teams
    - Operations
    - Strategic
  - Communicating your vision, value and idea(l)s
How to Get Where You Want

- Manage up and manage down
  - Your goals are your bosses goals – know them
  - Set your bosses expectations for your performance
    - Communication

- When managing
  - Your goals are their goals
  - Remember who is doing the work – give the credit
Bottom Line

- Find what makes you passionate and excited
- Bring your values and ethics
THANKS!!

Hope I haven’t bored you
Hope I have contributed something to your career thoughts