

Academic and Business Careers in Biomedical Research

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SEPTEMBER 14, 2011

Today's Agenda

- My background, UR experiences, transition to translational research and business
- Business experiences: SRI, Varian, startups
- Alternatives to academia
- Small vs. large firm
- Compensation
- How to approach a job search
- Questions and answers

My Background

- BSc (Honours) Biology, Acadia U, Nova Scotia, Canada 1961
- PhD, Biophysics/Radiation Biology, U Rochester, 1966
- Postdoc, NHICR Oslo 1967 (membrane biochemistry), OCF/ U Western Ontario, London 1968 (tumor biology and cell culture)
- Lecturer/Asst. Prof./Assoc. Prof. Biophysics / Therapeutic Radiology UWO/OCF, 1968-1976 (tumor microenvironment, spheroid model)
- Assoc./ Full Prof. U Rochester Radiation Oncology/Cancer Ctr., Biophysics (Assoc. Director Cancer Ctr. for Exp. Therapeutics) '76-'88
- VP & Executive Director, Life Sciences, SRI Intl, 1988-95
- Consulting Prof. Radiation Oncology, Stanford, 1988-2006
- President Varian Biosynergy, VP Varian Medical Systems, 1995-2006
- VP Commercialization, OICR, 2007-2010, Senior Invest. Officer, 2010-

Influences on Me of Experiences at U Rochester Medical School

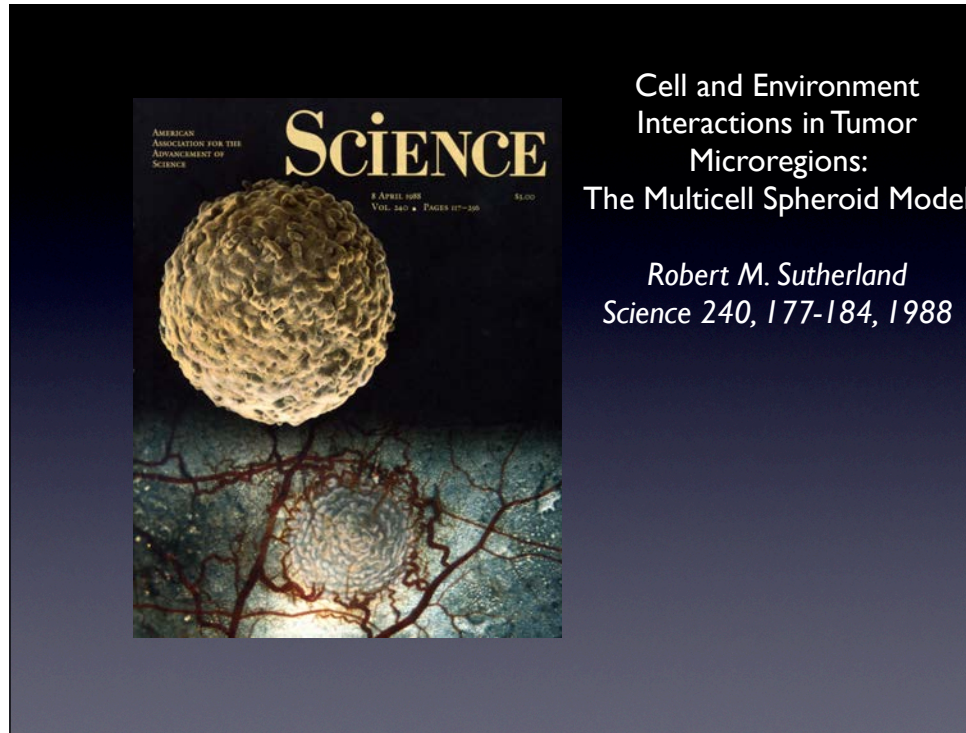
- PhD/MD interactions in basic and translational research
- Research teams and collaborations (centers)
- Interest in membrane biophysics led to radiation and cancer research
- Opportunities for courses/seminars on clinical relevance
- Met and married Karen (nurse) and started family
- Postdoc in Norway and Canada at cancer centers

Development of my Focus on Translational Cancer Research

- Founding faculty member of UR Cancer Center with biopsychosocial approach to the patient
- My leadership of Cancer Center/Experimental Therapeutics enhanced my interest in translational research
- Opportunities to develop needed relationships with industry to benefit the patients
- Gradual increase in acceptance of academia-industry collaborations
- Recognition by academia of benefits of protection of intellectual property (patenting, etc.)
- Significant administrative leadership experience at URCC

My Academic to Business Transition

- Developed multicell spheroid tumor model to study both basic and translational questions



Important publication that summarized results of much of the research of my group and described this model. Grew to different sizes of just a few cells and up to a millimeter in diameter containing 200,000 cells. Small cancers would look like this in our bodies where the environment is supplied by blood vessels that are trying to keep up with the rapid growth of the cancer cells. Large cancers can be considered of consisting of many of these smaller regions where the environments are abnormal and influence the cells.

My Academic to Business Transition

- Developed multicell spheroid tumor model to study both basic and translational questions
- Move from UR to SRI International/Stanford
- Exposure to translational research in many fields and disciplines resulting in cross-pollination for innovation
- Increased knowledge and developed comfort level for business procedures, contracts, patents, etc.
- Administrative leadership of translational groups such as toxicology, medicinal chemistry, business consulting
- Developed contacts with industry internationally
- Stimulation of the Silicon Valley California environment for innovation and entrepreneurship

My Academic to Business Transition (cont'd)

- Move to Varian Medical Systems - company management as a VP and President of Varian Biosynergy
- Continued NIH grants and appointment at Stanford during SRI and Varian roles
- Collaboration with academia continued and was main strategic focus with Varian Biosynergy
- Simultaneous experience with management of billion dollar corporation and with 'startup' subsidiary
- Move to new Ontario Institute for Cancer Research (OICR) for translational research to set up and lead commercialization of discoveries
- Experience at OICR implementing and guiding 16 investments in innovation - 8 new companies created
- Current board work - business, not-for-profit, academic

Centre for Imaging Probe Development and Commercialization

Canadian Centre of Excellence

McMaster University

Hamilton, Ontario

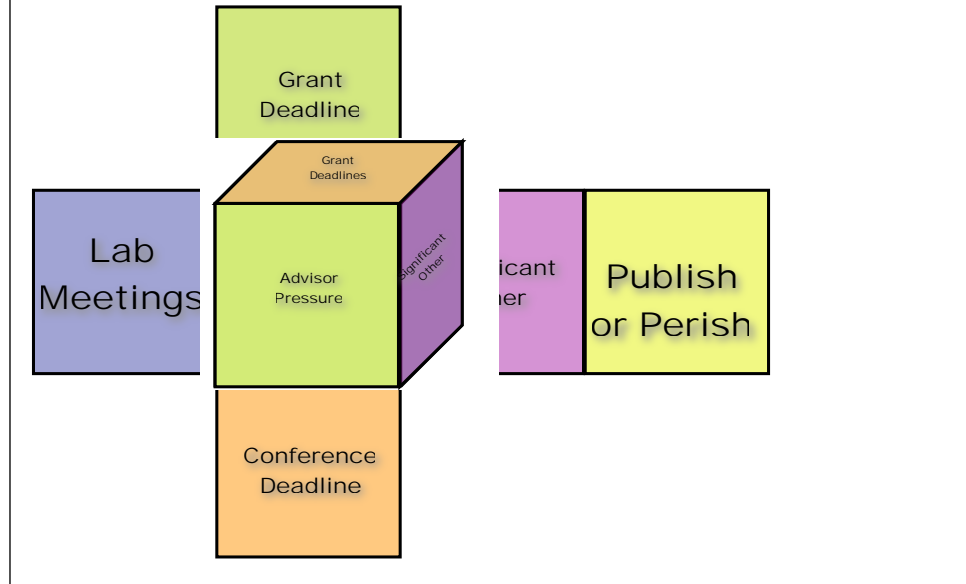


www.imagingprobes.ca

Non-Academic Career Opportunities

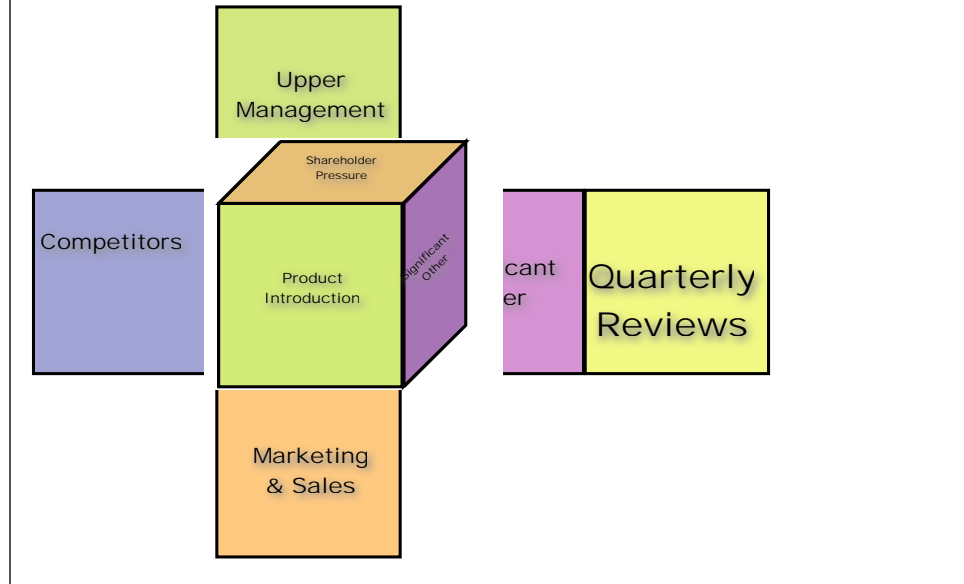
- Pharmaceutical, biotech, and medical device companies
- Research institutes
- University/institute technology transfer offices
- Government organizations/laboratories
- Legal firms and related organizations
- Consulting companies
- Marketing and promotion
- Data analysis/reports/publications

Academia Motivators



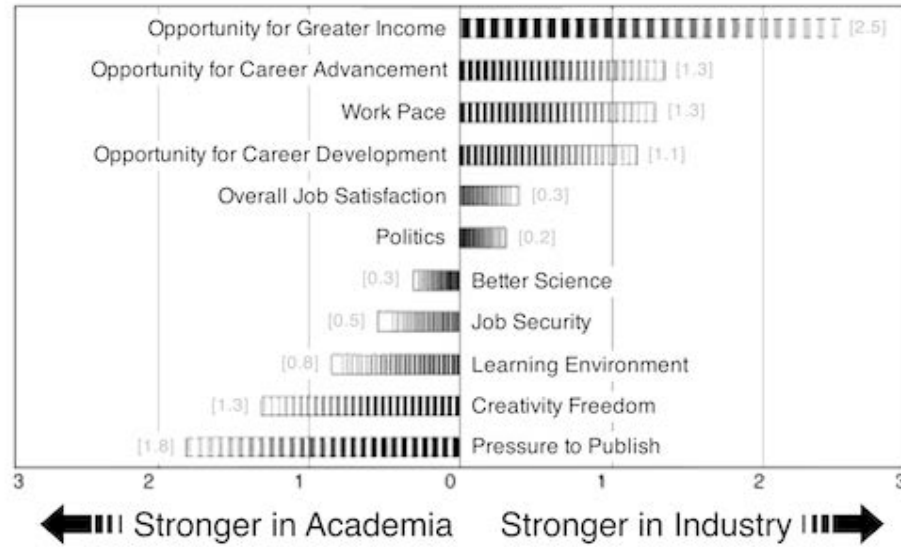
When you are an academic – many external forces serve to motivate you – most likely pressure from your advisor, grant deadlines, conference deadlines, the constant need to publish papers... even pressures from your boyfriend/girlfriend or spouse...

Business Motivators



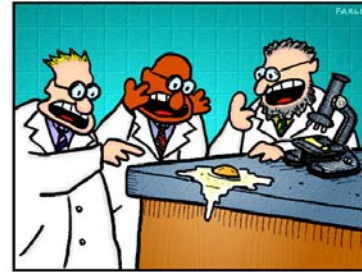
You can see here that the 'motivators' as I call them are quite different in industry – you will have pressures from upper management to fulfill certain goals... Product introductions as well as interactions from marketing and sales people can affect your priorities. Since the overall goal of a 'going concern' (as business people call companies) is to increase shareholder return, shareholders figure into this equation, and ultimately manifests themselves through upper management. Of course, your significant other might also have something to say: "You'll make HOW much more by going into industry?" Or "I don't care if your tenure track position is in North Dakota... I'm NOT moving there."

Differences between Academia and Industry



The role of the PhD in business

- Invention
- Technical management
- Scientific leadership
 - Bridge between marketing and R&D
 - Anticipate trends
 - Keep up with literature
 - Attend conferences
 - Due diligence



Recent excitement in the microbiology lab ended abruptly when Dr. Roscoe's "giant amoeba" turned out to be a fried egg.

Examples of Working in Industry:



Inside Varian: R&D

- Dedicated center for **R**esearch
 - Engineers (electrical, mechanical)
 - Chemists
 - Material Scientists
 - Physicists
 - Biologists

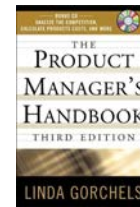


- Projects include:
 - Flat panel technology
 - Cone beam computed tomography
 - Physiologic gating
 - Biological applications



Inside Varian: Product Managers

- Lead product definition
 - Interact with customers (radiation oncologists, surgeons, physicists)
- Implement product development strategy
- Create business, marketing plans
 - Pricing, positioning, differentiation
- Introduce product



Inside Varian: Biosynergy

- Wholly owned subsidiary of VMS
- Exploit opportunities in biotechnology and molecular medicine to enhance radiation therapy
- Research partners
- Collaborators
- No in-house biology experiments



Considerations When Choosing a Company

- Number of employees (5000? 5?)
- Startup? Established ?
- Budget for R&D / total funding
- Advanced degrees?
- Age of employees?
- Culture
 - Engineer-driven
 - Market / customer driven
 - Cubicles?
 - Tenure of employees
 - 20 years? 20 months?



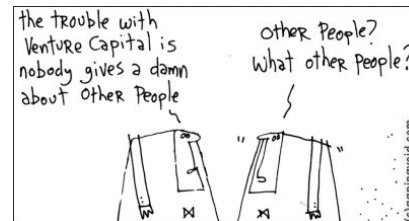
Foosball table (any startup)



Google's snack room

Questions about a startup

- How much money is in the bank?
- Venture funded?
 - Who are the VCs?
 - When is next fundraising round?
 - Current investing climate?
- Burn rate?
- Options? Useful?
- Milestones to be met
 - Realistic?
- Exit strategy?



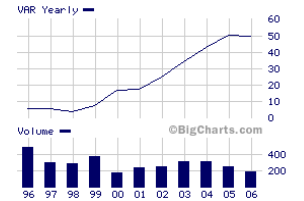
Show me the money



Alright Bob, I've listened to you talk for a while now... Show me the Money...

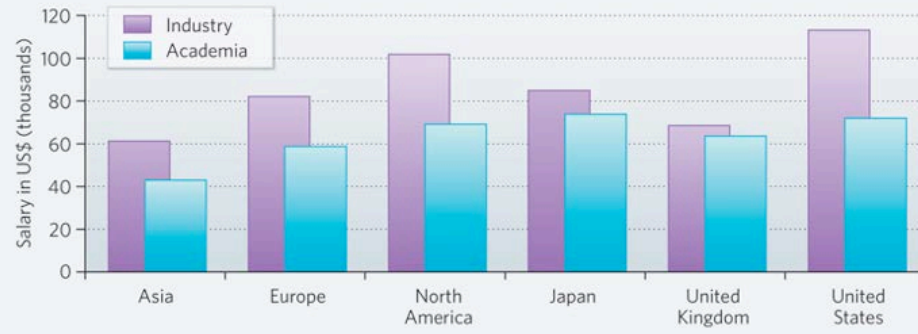
Compensation

- Salary
- Options
- Bonus (signing, performance)
- Stock purchase plans
- Other benefits
- Holiday parties great!



Don't underestimate the value of options – Steve Jobs has been taking home \$1 in salary since he returned to Apple over 10 years ago. In appreciation, the Apple's Board bought him this Gulfstream Jet 2 years later. I pulled this stock chart from the past 10 years – the length that I have been at Varian.

SALARIES: ACADEMIA VS INDUSTRY



Nature 465, 1104-1107 (23 June 2010) | 10.1038/nj7301-1104a

Finding a job

- > 80% of all jobs are not advertised
- Getting past HR
 - Ask anyone to help you, likely redirected to HR
 - Tend to look for resumes that exactly fit job required
 - Goal should be to get to the hiring manager
- Jobs can often be modified or created to fit the right people



Well no, it's all I'm trained for, but I really want a change and I guess you know that. I'm willing to start at the bottom.

Preparing for your interview

- Know the company
 - Products, history, competitors
- Be honest
 - Better to say “I don’t know” than BS
- Prepare some good questions
- Research your interviewer
 - Publications, inventions
- Job talk
 - Should be relevant
 - Concentrate on your contributions
- Compensation
 - To be negotiated with HR



How to begin?

- Networking (opportunity today!)
- Networking (introductions from your advisor)
- Networking (from colleagues)
- Networking (at social gatherings)
- Networking (any other way you can think of)
- Internet job boards (Monster, Biospace, etc)
 - Monster, Biospace, Sciencecareers.org
- Trade publications (AuntMinnie.com, etc)
- Recruiters (tend to be higher level)
- Corporate websites

Networking

- Does NOT necessarily mean asking for a job
 - Get the word out that you will soon be looking
 - Turn one lead into three
 - Friends tend to be a great 'filter' for quality
 - Learning
 - What are your interests?
 - Feedback

A caution about job boards

- In the age of the internet...
 - Many recruiters utilize search engines to fill positions
 - Be careful in using key words
 - “Perform MRI experiments dealing with in vivo models of mammary carcinoma in a murine model”
 - Often will lead to jobs as an MRI technician

Good Luck!

- Thank you for your attention!



- bobsuth@me.com

Questions and Answers

- 1. How can you direct your research towards industry in an academic setting? In other words; how can you make your research/experience more attractive to industry if you are looking for an industrial job while you are working in academia?
- Answer:
- i) learn more about what industry is looking for in your field of research and what the clinical challenges are and the products in trials
- ii) establish some contacts with industry researchers
- iii) choose aspects of research direction relevant to key questions/challenges

Questions and Answers

- 2. Is there an efficient way to identify novel therapies for early phase investigation? If there are not many novel therapies ready for early phase investigation at your institution, how does one gain access to therapies?
- Answer:
- i) novel therapies require research to identify mechanisms and novel targets/pathways
- ii) investigate whether modulations of targets/pathways favorably affects disease process
- iii) communication and collaboration with medicinal chemists and biologists in other universities and companies

Questions and Answers

- 3. I am interested in knowing how to establish connections in the private sector, primarily pharmaceutical companies. Also, what types of experiences do they look for from recent PhD graduates that sets them apart from other applicants?
- Answers:
- i) communicate at conferences (poster sessions, appointments) and emails
- ii) abstracts and presentations by student at relevant sessions
- iii) invite them to give seminars at UR
- iv) graduates with experience with novel biological assays for targets/pathways or new techniques/equipment are attractive

Questions and Answers

- 4. For industry, is there an advantage of having a PhD as opposed to having a Master's in terms of the type of "lab bench" research positions available when I apply for jobs after graduation? Is there an advantage in terms of salary? What if I prefer to stay on positions that are heavily based on bench work in the long run? Is a post doc position in academia necessary to enter industry for these positions? If so, is one post doc enough?Answers:
 - i)often depends on your desired role in the supervision and planning of research and the expectations of you by your employer (more routine lab bench work vs. varied)
 - ii)you could have a very satisfying and happy career/life with a Masters degree although usually less salary than PhD
 - iii)I assume you want bench work and not additional administration responsibilities(?). Competition will most likely have had one or two postdocs but could consider applying for 'masters positions' that may prefer PhD but with little postdoc experience

Questions and Answers

- 5. In finding job positions in industry, is it also possible to contact individual PIs to look for positions that are not listed in the pharmaceutical company's website? I haven't come across a list of PIs available on the website of several pharmaceutical companies in the northeast; are they available elsewhere? Answers:
 - i) I highly recommend contacting individual PIs
 - ii) look for conferences where they participate

Questions and Answers

- 6. Is there a big gap in terms of salary for Scientist positions in industry versus academia?
- Answers:
- i) average of about 40% greater in industry across fields
- ii) differences in academic vs. industry salaries may depend on field of specialization

More Questions and Answers