Industries Defined

- **Business Management**: The activities associated with running a company, such as controlling, leading, monitoring, organizing, and planning.

- **Professional Services**: The business of helping customers make decisions: Consulting, investment banking, venture capital, accounting, law, etc.

- **Consulting**: The business of giving expert advice to other professionals, typically in financial and business matters.
PhDs Are Highly Regarded In Consulting

• “We were one of the first to recognize the value of the non-business pursuit… Today, more than half our consultants have a doctorate, law, medical, or non-business master’s degree.”

• “Whether someone’s background is in life science, physical science, or a humanities field, PhDs and post-docs who come to BCG know that we will give them the opportunity to apply their expertise in a particular field, like health care.”

• “The ideal hire may hold a BA/BS, MPH, PhD, or MBA – may be a fresh graduate or bring deep expertise – but is driven by a passion for the life science industry, supported by keen analytical skills.”

Consulting Entry Points And Career Progression

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyst</td>
<td>Data Sourcing &amp;</td>
<td>Finds data to inform analytics and manages basic analytics (e.g., database analysis)</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Associate /</td>
<td>Analytic &amp; Story</td>
<td>Manages detailed analytics like financial modeling and can articulate the impact of those analyses</td>
</tr>
<tr>
<td>Consultant</td>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Manager</td>
<td>Project Management</td>
<td>Designs analytics, determines workflow and process, and ensures deliverables are high quality</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Director /</td>
<td>Client Management</td>
<td>Manages more complex projects and is the primary point of contact for the client</td>
</tr>
<tr>
<td>Senior Director</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managing</td>
<td>Account and Business</td>
<td>Builds and maintains relationship with clients; responsible for selling projects and managing the overall business</td>
</tr>
<tr>
<td>Director</td>
<td>Management</td>
<td></td>
</tr>
</tbody>
</table>

Typical Entry Points
Consulting Interview Process

- Test for fit, culture
- Skills tests
- Personality tests
- Etc.

- Test for structure and problem solving
- Test for relevant experience and understanding

How Many Cars Are On The Island Of Manhattan At 12pm On A Tuesday?
Structuring Of Your Analysis Is The Point Of The Case Exercise

Framework
- Describe your approach – e.g., I will brainstorm all possible contributors, then estimate, then answer...
- Contributors: Residents, Commuters, Taxis, Car Dealerships, etc.

Execute
- Work through your case as you described – e.g., Talk through how you would estimate each contributor
- Residents: 10M live in NYC, 50% driving age, ~10% have cars = 500K cars

Answer
- Bring all of the pieces together and caveat
- 500K + 10K +… = ~1M cars
- “Research variables, such as # of cars who use the Lincoln Tunnel each day…”

Keys To Interview Success

1. Demonstrate knowledge of and strong interest in the company
2. Think before you speak
3. Communicate clearly and concisely
4. Demonstrate logic and structure
5. Be yourself
Consulting Lifestyle: The Trade-Off

Intensity: ~60 hours a week; can spike to more; Travel

Constant learning; high exposure; high reward

Consulting Exit Options = Other Business Management Entry Points

e.g., MBA program  Research  Pharma Industry

Banking / Venture Capital  Corporate Strategy  e.g., Michael J Fox Foundation
Careers in Drug Development

Regulatory Affairs
Clinical Trial Monitoring (CRC/CRA)
Drug Safety
Medical Affairs

Barbara Gladson
January 20, 2015

Regulatory Affairs Professional

An individual possessing knowledge of the regulations, guidelines, and policies governing the discovery, development, manufacturing, governmental approval, commercial distribution, advertising and promotion of medicinal products

http://diahome.org
LoRusso, P. Clin Cancer Res. 2010;16(6).
Drug Safety Officer

These individuals proactively review safety profiles, perform signal detection, develop risk management plans & REMS, review promotional material, generate risk-benefit ratios, and file drug safety reports to the appropriate regulatory agencies.

Mainly MDs, PhD, PharmDs, RNs and other with some clinical background
Clinical Research Associate

- Also known as the Monitor
- Involved in all aspects of development from phase I-IV
- Human protection: involved in writing the ICF and filing with IRB
- Site Selection
- Date integrity-source verification
- Adherence to GCP & regulatory guidelines
- Trial Master File
- Multi-Site Coordination
Clinical Research Associate

- Test Article Inventory, Storage, Packaging and labeling
- Recruitment plan
- Ensure adverse event reporting
- Product accountability
- Study closeout
- Advancement of Product Development
- Contract negotiations

Clinical Research Coordinator

- Informed Consent
- Subject Selection, Screening & Recruitment
- Source Documentation
- Test article Inventory & Storage
- IRB Approval
- Study Manuals
- Audit Preparation
- Contract Negotiations
- Billing Compliance & Insurance
Medical Affairs/Medical Information

- Integrates clinical and scientific knowledge to formulate development protocols-
- Communicates the products value and safety in a variety of venues
- Become a product specialist: ADRS, Drug-drug interactions, get this info out
- Evaluation of available medical literature
- Scientific support at national meetings
- Medical strategist: investigate unmet needs

Medical Affairs/Medical Information

- Support marketing: assist with design and construction of all promotional materials
- Study design, initiation and monitoring
- Medical liaison reps-field based medical information specialists
Other Careers

• Medical writer
• Compliance officer
• Patient Advocate

How to Prepare yourself for a Career in Pharma

• Join professional organizations:
  Association of Clinical Research Professionals (ACRP)
  Society of Clinical Research Professionals (SOCRA)
  Drug Information Association (DIA)
  Regulatory Affairs Professional Society (RAPS)
  Society for Clinical Data Management (SCDM)
  International Society for Pharmacoepidemiology (ISPE)
  International Society of Pharmacovigilance (ISoP)
How to Prepare yourself for a Career in Pharma

• Network! Network! Network!
• Familiarize yourself with the FDA website
• Review key regulations
• Apply for mentoring experiences
Quick Intro

- Background: MPA in Health Policy, BA in Political Science
  - I was a pre-med student for 2 years in my undergrad studies
- Communications and Public Affairs
  - *Not* Human Resources
- Consumer/Personal Care Prod.
  - *Not* Pharma, Medical Devices, Biotech, Diagnostics, or OTC
Tonight’s Goals
Describe various private sector career opportunities for PhD students in the life sciences and engineering and suggestions on how to best prepare for a career.

What is Health Policy?
- Concerned with the development and evaluation of strategies to improve the functioning of the health care delivery system.
- Roles include positions in governmental agencies, healthcare providers, research/nonprofit organizations, drug manufacturers, to name a few.
- Responsibilities often include the development and analysis of data to support policy initiatives.
- Assessment of new health care initiatives using techniques such as cost-benefit analysis, program evaluation, implementation analysis, and the development of formal health plans to anticipate future needs for health care resources.
Career Opportunities

Medical or Scientific Affairs

**Medical Affairs**
- Ex: Chief Medical Officer, Director for Medical Affairs
- Typically MD, DO, or related medical degree
- Other roles include Toxicologists, Clinical Evaluations, Clinical Research
- Responsible for assessing safety of products, managing clinical trials/evaluations, liaising with other medical officers (e.g., CDC, FDA, etc.)

**Scientific Affairs**
- Ex: Sr. Director for Global Scientific Engagement, Scientific Affairs
- Depending on level, but BA through Doctoral degrees in biology, chemistry, pharmacology.
- Sits within R&D organization
- Responsible for engaging with medical and research professionals, educating/engaging with scientific organizations on J&J product standards.
Regulatory Affairs & Policy

**Regulatory Affairs**
- Typically Masters or PhD in life sciences or engineering. Position dependent.
- Responsible for translating government regulations into operational frameworks for product development
  - Also plays a role in influencing regulatory policy change, advocacy, engaging with various external stakeholders

**Product Stewardship**
- Depending on level, but BA through Doctoral degrees in biology, epidemiology, chemistry, pharmacology, engineering, etc.
- Position dependent.
- Responsible for sustainability and integrity of raw materials, ingredient policy determinations, identifying ingredient alternatives, work with supply chain partners on ingredient policy/issues

Environmental Health & Sustainability

- Typically Masters or PhD in life sciences, particularly environmental sciences, sustainability or engineering
- Responsible for ensuring supply chain sustainability of consumer products, making packaging & product innovations, assessing environmental impact of consumer products
Govt. Affairs & Policy

**Health Economics/Market Access**
- Typically Masters or PhD in statistics, health policy, public administration
- Help determine financial impact of healthcare products on the marketplace
- Determine pricing, studies market cost structures, articulates economic arguments for the regulation (or deregulation) of certain products

**Global Health Policy**
- Depending on level, but BA through Doctoral degrees in epidemiology, public health, some life sciences
- Position dependent
- Responsible for creating white papers and developing J&J positions on global health issues. Conduct research in partnership with Health Economists on market needs/disease states.

Preparing for a Career
Quick Advice

- Blend work experience with academics by finding relevant jobs
- Pick courses that are more hands-on and technical
- Develop soft skills
  - Particularly communication, leadership, decision-making, and management skills
- Identify emerging areas to focus graduate/doctoral research

Best Steps

- Network!
- Never think any task or job is outside your designated role
- Don't be afraid to volunteer
- Study the industry and know the economy/markets
Questions?

Thank you!
Job Hunting is Like Dating, Sorta.

A = Real hindrance
B = You can do it online
C = How you doing?
D = Hey, nice chest.
   (Always a bad opener.)
“The clinical trials systems is broken.”  Lee Hood

“It is difficult to get a man to understand something when his salary depends on not understanding it.”  Upton Sinclair
Harnessing the Power of Exponential Technologies

- Ubiquitous Networks
- Ubiquitous Sensors
- Artificial Intelligence
- Robotics
- 3D Printing
- Synthetic Biology
- Materials Sciences
- Digital Medicine
Bio P4 Medicine
A 2 day "bring a topic and discuss", brainstorming un-workshop
TMED PLATFORM FOR PERSONALIZED MEDICINE

- Collect genomic, clinical and molecular data from individual patients.
- Analyze this virtual cloud of information with predictive algorithms.
- Match patients with specific treatments or treatment combinations based on phenotype.
Medicine and Health Will Be A Data Driven Business

- Population health
- P4 Medicine (Preventive, Predictive, Personalized and Participatory) Medicine
- Wellcare, not healthcare
- Fitness
- Drug development
- Nutrition
Jobs

• Who?
• What?
• Where?
• How much?

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Distribution of Open Positions Requiring Big Data Skills (9/1/14 - 12/29/14)</th>
<th>% Growth in Job Demand For This Occupation Over the Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Developers, Applications</td>
<td>25.10%</td>
<td>51.50%</td>
</tr>
<tr>
<td>Computer Systems Engineers/Architects</td>
<td>10.40%</td>
<td>45.10%</td>
</tr>
<tr>
<td>Marketing Managers</td>
<td>6.50%</td>
<td>84.80%</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>4.50%</td>
<td>89.80%</td>
</tr>
<tr>
<td>Market Research Analysts and Marketing Specialists</td>
<td>4.20%</td>
<td>56.40%</td>
</tr>
<tr>
<td>Management Analysts</td>
<td>4.10%</td>
<td>-11.90%</td>
</tr>
<tr>
<td>Web Developers</td>
<td>3.90%</td>
<td>42.70%</td>
</tr>
<tr>
<td>Network and Computer Systems Administrators</td>
<td>3.80%</td>
<td>75.70%</td>
</tr>
<tr>
<td>Information Technology Project Managers</td>
<td>3.70%</td>
<td>123.80%</td>
</tr>
<tr>
<td>Computer and Information Research Scientists</td>
<td>3.60%</td>
<td>85.40%</td>
</tr>
<tr>
<td>Others</td>
<td>30.20%</td>
<td>84.80%</td>
</tr>
<tr>
<td>Totals</td>
<td>100.00%</td>
<td>81.90%</td>
</tr>
</tbody>
</table>
Top 20 Industries Hiring Big Data Expertise
Source: Wanted Analytics, 2014

- Professional, Scientific, and Technical Services
- Information
- Manufacturing
- Retail Trade
- Sustainability, Waste Management & Remediation Svs
- Finance and Insurance
- Wholesale Trade
- Educational Services
- Other Services (except Public Administration)
- Accommodation and Food Services
- Health Care and Social Assistance
- Real Estate and Rental and Leasing
- Construction
- Transportation and Warehousing
- Public Administration
- Management of Companies and Enterprises
- Arts, Entertainment, and Recreation
- Mining, Quarrying, and Oil and Gas Extraction
- Utilities
- Agriculture, Forestry, Fishing, and Hunting
“The only way to do great work is to love what you do. If you haven't found it, keep looking. Don't settle.”

- Steve Jobs
You are cordially invited to the
Closing the Gap Now Conference
February 18th, 2015
10 a.m. - 4 p.m. Fall Creek Room
New York’s Cornell Club 6 E. 44th Street

Sponsored by The Richard M. Schulze Family Foundation in Cooperation With The Elizabeth Kaufman Transforming Medicine Institute
At 7:30 p.m. please join us for the Lincoln Center Premiere of the riveting film: “Surviving Terminal Cancer”

Join us in connecting patients to the best treatments at the speed of life.
RSVP here: http://closingthegapnow.org/

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Vice President
Center for Medicine in the Public Interest
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Patent Law and Intellectual Property
Careers with a Biology Ph.D.

James J. DeCarlo, Esq.
Shareholder
Greenberg Traurig, LLP

Presented to Rutgers University
January 20, 2015

Why Intellectual Property?

“In this new ecology of competition, it is not land or natural resources but intellectual property that now carries the DNA of wealth creation, the genetic code for competitive advantage.” – Rembrandts in the Attic

(emphasis added)
Why is Intellectual Property Important to Your Career?

- You may focus your career in IP (e.g., patent attorney / agent / USPTO examiner, etc.)
- You may work for or become a consultant to a business - IP has become a cornerstone for every business portfolio
- Every business generates IP:
  - Products / Services
  - Brand recognition
  - Creative works

Potential Careers in Intellectual Property

- Patent Attorney
- Patent Agent
- IP Paralegal
- Biomedical Consultant
- Licensing Manager
  - E.g., Technology Transfer Office; Pharmaceutical Companies / Medical Device Companies
  - In-licensing and out-licensing
- Patent Examiner*
  - *Required to be a US citizen
- Intellectual Property Strategist for a Start-Up
Becoming Part of the Conversation...
Networking and Exposing Yourself to Growth Opportunities

- American Intellectual Property Law Association (AIPLA)
- New Jersey Intellectual Property Law Association (NJIPLA)
- Licensing Executive Society (LES)
- American Chemical Society (ACS)
- United States Patent and Trademark Office (USPTO)
  - Seminars and Roadshows
  - Rutgers Office of Technology Commercialization

**TAKE AWAY:** GET OUT THERE – You will not obtain exposure or substantive experience any other way

---

Becoming Part of the Conversation...
Patent Blogs

- http://www.ipwatchdog.com/
- http://www.patentbaristas.com/
- http://patentlyo.com/
- http://www.biotech-now.org/public-policy/patently-biotech#
- http://www.fiercepharma.com/
- http://www.scotusblog.com/
Becoming Part of the Conversation…
Using Your Network to Gain Opportunities and Mentorship

- Rutgers University
  - E.g., students and graduates from your program, Business school students, alumni, faculty
- Your undergraduate institution
  - E.g., alumni groups. And – if a group focusing on your interest (IP) does not exist, found it.
- Family & friends
- LinkedIn

TAKE AWAY: Creative people make opportunities.

THANK YOU!