



A Career in Biotechnology

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About the Trainer, Carolyn Tsao

○ Education:

- UCLA – B.A. in English and Asian American Studies
- UCI – M.B.A.
- HR Certification Institute, International – SPHR (Senior Professional Human Resources)
- UC Berkeley – HR Management Certification Program
- American Management Association – HR Management Certification Program

○ Experience:

- Genemed Biotechnologies, Inc. (currently Director of HR)
- Zymed Laboratories, Inc.
- National Geographic
- Special Olympics
- Law Offices of Carole Georges



Agenda

- What is Biotechnology?
- Why choose the Biotechnology industry?
- How does a Biotech company function?
- Positions for non-scientists
- What companies look for when hiring and what you can do to prepare for a career in Biotech
- Q&A

What is Biotechnology?

Biotechnology is the use of biological processes, organisms, or systems to manufacture products intended to improve the quality of human life.

Common Applications of Biotechnology

Agriculture

Improved foods, pest control, plant and animal disease control, improved food production.

Health Care

Drugs, vaccines, gene therapy, tissue replacements.

Industry

Environmental protection, waste reduction. Improved detergents, chemicals, stronger textiles.

Research

Understanding the human genome and better detection of diseases.

Types of Biotechnology Companies

- **Bio-pharmaceutical**

- Bio-pharmaceutical companies are involved in manufacturing medicines - includes vaccines to control the spread of diseases, products which help in the diagnoses of diseases and, of course, products which treat diseases.
- Basically, companies can be split into two major categories – monitoring and treatment.
- Amgen, Genentech, Roche, Johnson&Johnson, Genemed Biotechnologies, Inc.

Types of Biotechnology Companies

○ **Forensics**

- involved with forensic identification using DNA
- forensic bio-technologists work for law enforcement or a company which does DNA testing for law enforcement
- the role of forensic scientists is to test forensic evidence and determine how it relates to human identification.
- some examples of forensic identification include identifying suspects whose DNA matches the crime scene, establishing paternity or exonerating those wrongly accused.

Types of Biotechnology Companies (cont.)

- **Environmental Biotechnology**
- hugely expanding industry in the 21st century
- studies the natural environment and finding new and better ways to produce renewable energy
- According to the International Society for Environmental Biotechnology (ISEB), their mission is to find "a natural way of addressing environmental problems ranging from identification of biohazards to bioremediation techniques for industrial, agricultural and municipal effluents and residues."

Types of Biotechnology Companies (cont.)

- **Bioprocessing**
- involves using microorganisms and enzymes to develop products
- used for hundreds of years to make bread from yeast, or yogurt from cultures
- Recently, biotechnologists have used bioprocessing in order to produce renewable energy fuels such as ethanol or bio-diesel. Other examples of bioprocessing include stem cell therapy, gene therapy and vaccines.



Top States in the US Biotechnology Industry

1. California
2. Florida
3. Maryland
4. New York
5. Texas



Top States in the US Biotechnology Industry

1. California: most biotechnology companies in US and top companies

- Over 3000 Biotechnology Companies
- 150,000 Employees
- the majority related to the pharmaceutical industry -over 80,000 people are employed in this sector alone
- thousands of people work within universities and research institutions.
- Most biotechnology companies in California are located in Los Angeles, San Diego and San Francisco.

Why Biotechnology?

Defensive Sector

- disease is relentless in both good economic times and bad – during the recent economic crisis, Biotech industry did not suffer as much as others
- a need for quality, innovative products to diagnose and treat a broad variety of diseases such as cancer, central nervous system disorders, cardiovascular diseases, diabetes, respiratory, and infectious diseases

Why Biotechnology?

Economic Driver

- innovative new medicines constantly being developed by life science companies lead to economic gains and job creation
- during the past 10 years the number of employees has increased by more than 90 percent – job creation
- as the nation's “baby boomers” continue to age, the demand for pharmaceuticals continues to grow
 - Revenues will increase at a compounded annual rate of 9 percent between 2012 and 2015.

Why Biotechnology?

Global Biotechnology Industry Growth

- Annual Growth 2007-2012: 10.4%
- Revenue: \$229 Billion
- Employment: 511,000
- Businesses: 10,437
- The industry's contribution to the overall global economy, is forecast to grow 11.8% per year on average through 2017

Why Biotechnology?

Rewarding

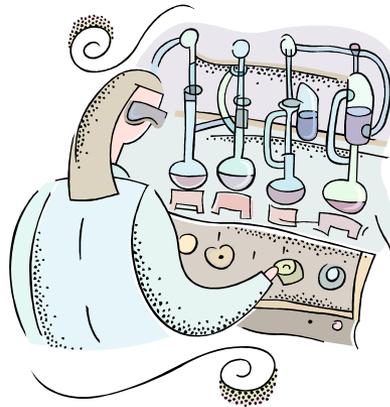
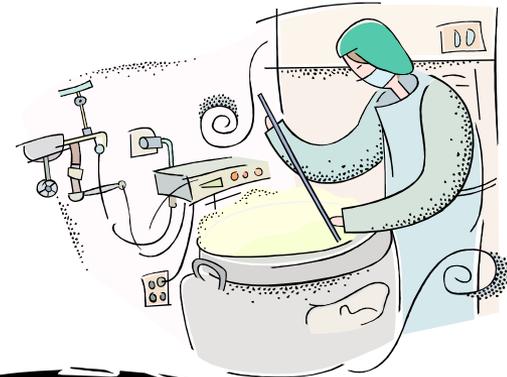
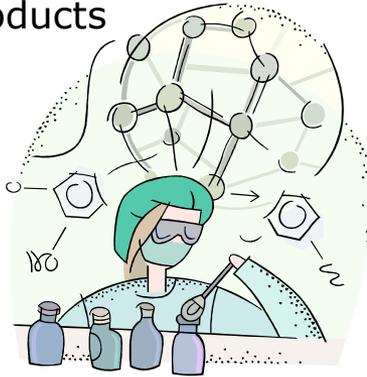
- **Provide better patient outcomes, improved quality of care, increased life expectancy** - know you are making a difference in the improvement of lives, including yours
- **develop medicines** that help patients with AIDS, stroke, heart disease, asthma, cancer, diabetes and many other diseases
- **develop diagnostic tests** used for pregnancy, AIDS, cancer and other conditions
- **cure genetic diseases** with gene therapy
- stem cell research

Why Biotechnology?

- **Make an impact on the agriculture and food industries**
 - being used to improve crop yields and increase plants' resistance to disease, insects
 - drought; increase milk production; treat and prevent animal disease; and develop better ways of processing foods
- **Help protect the environment**
 - help clean up many environmental hazards that have been caused by industrial waste

Scientists

- work directly on products



Careers in Biotech

Research & Development Jobs

- Animal technician
- Clinical research associate
- Forensic DNA analyst
- Greenhouse and field technician
- Instrumentation/calibration technician
- Laboratory assistant
- Laboratory automation specialist
- Laboratory technician
- Research associate
- Scientist

Manufacturing & Services Jobs

- Forensic DNA analyst
- Greenhouse and field technician
- Greenhouse and field worker
- Instrumentation and calibration technician
- Laboratory automation specialist
- Manufacturing assistant
- Manufacturing technician
- Material handler
- Scientist

Industry Professionals

- do not touch products but work to bring value to company



Career in Biotech

- **BS or MS** degrees in chemistry, molecular biology, microbiology genetics, biochemistry, computer science, and physics
- A **PhD** is required if you want to advance beyond the level of research associate. Scientists are typically employees with PhDs
- **Nonscience undergrads** can get a foot in the door in biotech manufacturing, pharma sales, or in administrative and management positions
- **MBA**s who forgo consulting and investment banking careers will find a more palatable work/life balance along with good pay and some of the best benefits packages around
- **MD**s can find well-paying, engaging work that offers regular hours

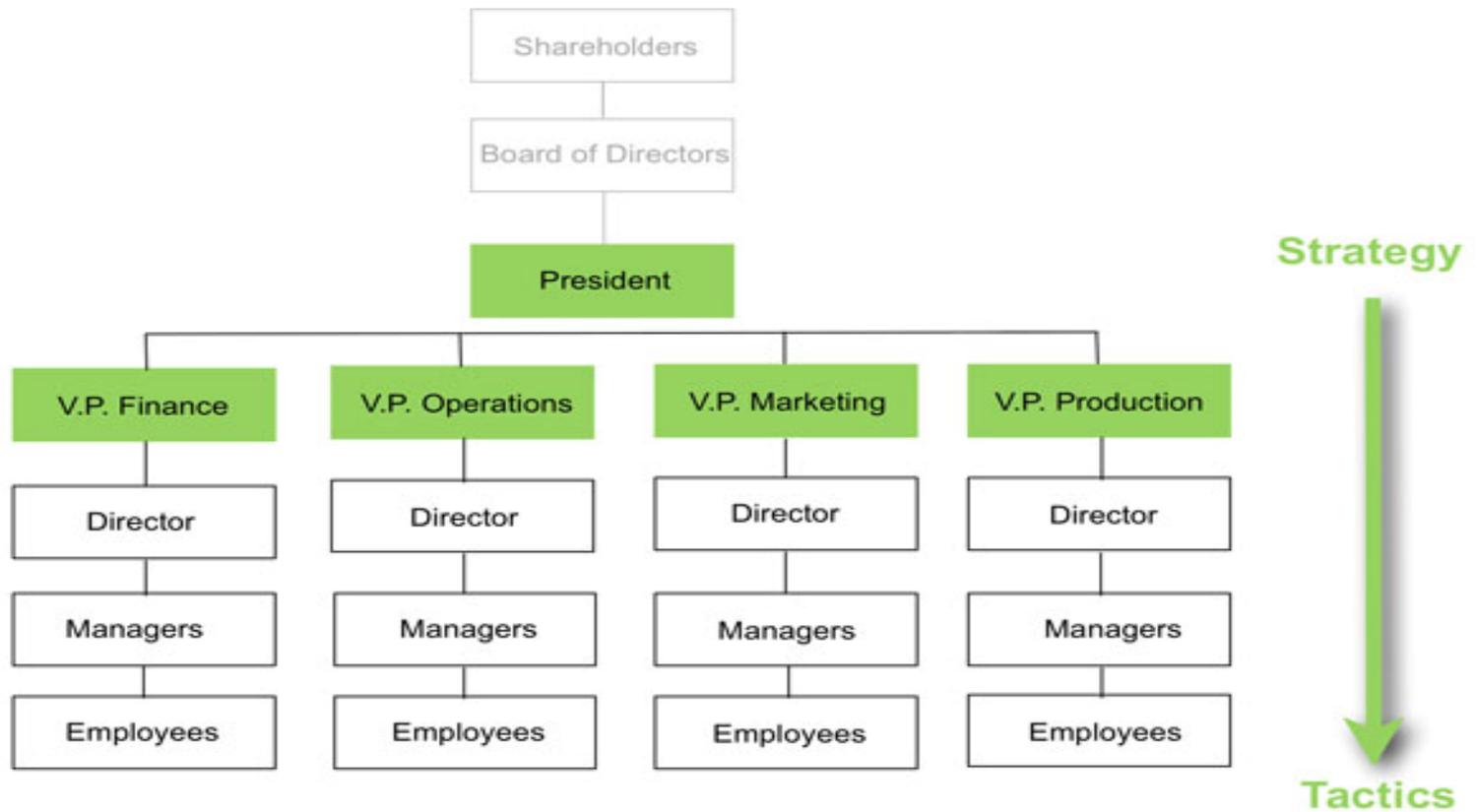
Careers in Biotech

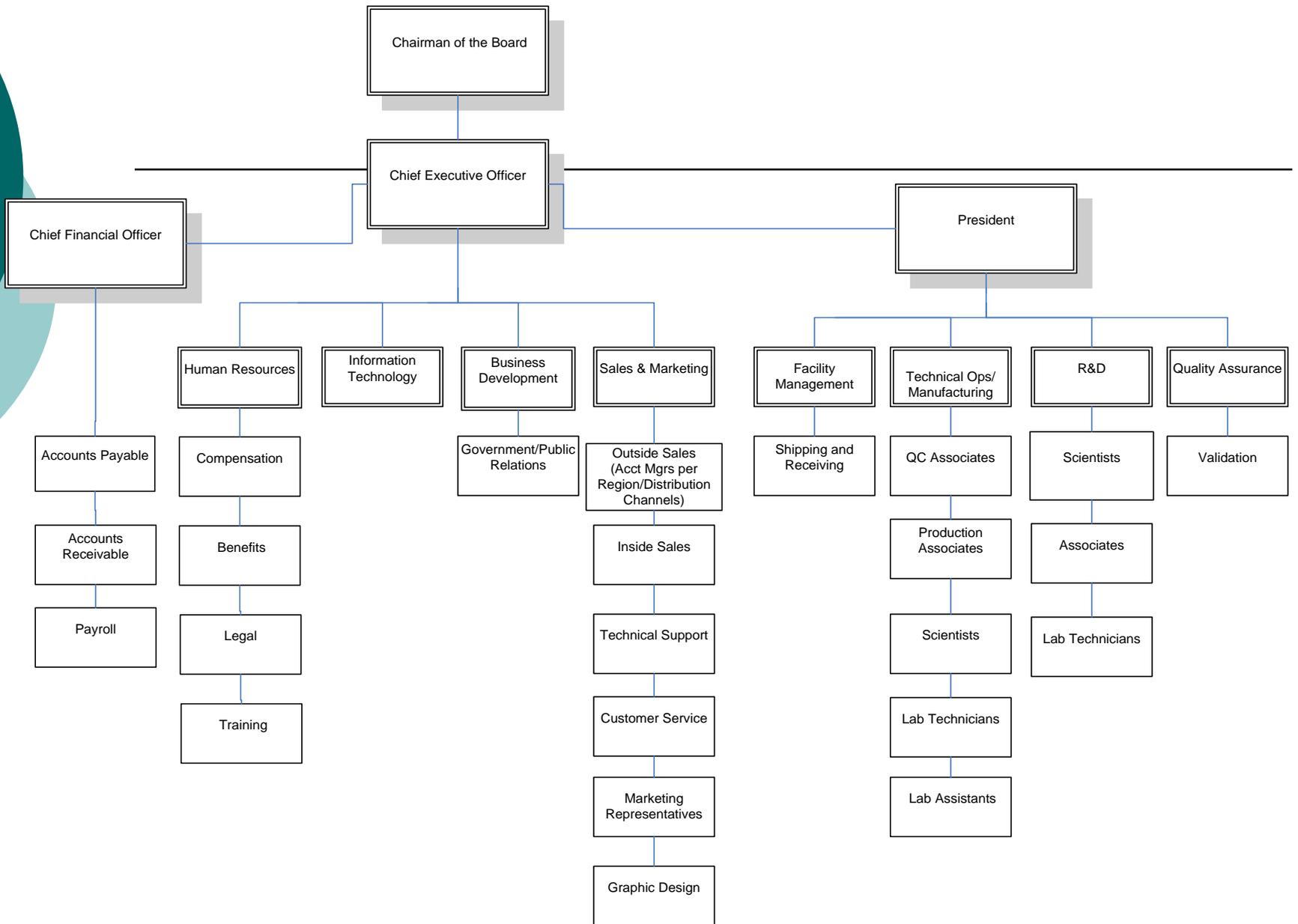
Administrative and Management Jobs

(not unique to biotechnology)

- **Finance - accountant, payroll specialist**
- **Government relations representative/Public relations/Advocacy**
- **Human Resources**
- **Facilities specialist**
- **Information technology**
- **Technicians**
- **Warehouse management – S&R**
- **Sales**
- **Graphic Design**
- **Manufacturing**
- **Paralegals, corporate lawyers, patent lawyers**

Business Organization Chart







Top Colleges for Biotech

- Purdue University
- Stanford University
- UC San Diego
- Worcester Polytechnic Institute
- Boston University
- UC Davis
- Oregon State University
- University of Pennsylvania
- Washington State
- Columbia University



Gain information about the industry

- Only way to see if you enjoy the industry is to gain exposure, you can:
 - Apply for an internship
 - Work part-time
 - Contact people within the industry for an informational interview
 - Ask friends, family, acquaintances that are in the industry for any insight
 - Join a network/club/association and obtain a mentor

What HR asks when reviewing resumes

- Do the applicant's skills and background meet the job criteria, as outlined in the job descriptions?
- Does the applicant's job history demonstrate progress, for example, increased responsibility and/or salary?
- Does the applicant's work history reflect job stability?
- Are there gaps or overlaps in employment history and education?
- What reasons are given for why an applicant wants to change jobs?
- Is the résumé neat and free of errors?
- Does the information on the résumé generate enough interest for you to meet with the applicant?

Reviewing Resumes

- **Dates of Employment**
- Short-term employment (job hopping)
- Part-time college employment
- Gaps in employment history
- **Salary Changes**
- Stagnant salary
- Increases
- Decreases
- **Title Changes**
- Increasing responsibility
- Decreasing responsibility
- **Career Goals**
- Realistic
- Planned and organized
- Obtained
- **Leadership**
- Military
- Employment
- Outside activities

What HR asks – Examples of Questions to Assess the Most Common Traits Employers Want from Employees:

Flexibility	Ability to Work Well with Others	Ability to Multi-Task
Give me an example of a job you worked on where there was little or no support or direction	We've all had to work with someone who is difficult to get along with. Tell me about a time this happened to you. How did you handle this person?	What do you do when a project or task you were working on is upset by unforeseen circumstances? Give me an example.
Tell me about how you learned something that you found difficult	Tell me about a time when you helped someone else out and it backfired on you.	Describe a situation where you were required to handle multiple things at once. How did you stay on top of all deadlines?
Tell me about a time when you had to change direction quickly	Describe a situation for me when you took matters into your own hands although your boss should have handled it.	Describe how you develop a project team's goals and project plans.
Problem-Solving	Ability to be Detail Oriented	Personal Effectiveness
Tell me about a project that you completed recently that was complicated. What did you do first? Next?	Tell me about a difficult experience you had in working with details.	Tell me about a recent job or experience that you would describe as a real learning experience. What did you learn?
We've all had occasions when we were working and something slipped through the cracks. Give me an example of when this happened to you.	Tell me about a situation where attention to detail was important in accomplishing an assigned task.	Tell me about a time when your supervisor criticized your work. How did you respond?
Tell me about a very frustrating experience at work and how you handled it.	Do you prefer to work with the big picture or the details of the situation? Give me an example of an experience that illustrates your experience.	Tell me about a time when you took responsibility for an error and were held personally accountable.

STAR Technique – How to best answer behavioral interview questions from HR

S Situation	Detail the background. Provide a context. Where? When?
T Task	Describe the challenge and expectations. What needed to be done? Why?
A Action	Elaborate your specific action. What did you do? How? What tools did you use?
R Results	Explain the results: accomplishments, recognition, savings, etc. Quantify.

'STAR' Technique to Answer Behavioral Interview Questions

Question and Answers

Thank you!

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