How to Get a Job in...

Bioinformatics

Bioinformatics and computational biology involve the use of techniques from applied mathematics, informatics, statistics, and computer science to solve biological problems. The terms bioinformatics and computational biology are often used interchangeably, although the former typically focuses on algorithm development and specific computational methods, while the latter focuses more on hypothesis testing and discovery in the biological domain.

Trends
Wage and salary employment in scientific research and development services is projected to increase 12 percent between 2004 and 2014.

Strong demand is anticipated for professional occupations—especially for life and physical scientists engaged in R&D. Computer specialists such as systems analysts, biostatisticians, and computer support specialists also will be in demand as disciplines such as biology, chemistry, and electronics continue to converge and become more interdisciplinary.

The highest growth is expected for computer specialists, scientists, and engineers—particularly those in the life and medical sciences. Biological scientists may be employed in biotechnology or pharmaceuticals. As information technology continues to be an integral component of R&D, opportunities for computer specialists are expected to grow rapidly, particularly for those with some biological science background working in bioinformatics.

Education and Training
Students planning careers as medical scientists should have a bachelor’s degree in a biological science. In addition to required courses in chemistry and biology, undergraduates should study allied disciplines, such as mathematics, engineering, physics, and computer science. Once they have completed undergraduate studies, they can then select a specialty area for their advanced degree, such as cytology, bioinformatics, genomics, or pathology.

A master’s degree is sufficient for some jobs in basic research, applied research, product development, management, or inspection. Computer courses are essential because employers prefer job applicants who are able to apply computer skills to modeling and simulation tasks and to operate computerized laboratory equipment. A Ph.D. degree is usually necessary for independent research, industrial research, and college teaching, as well as for advancement to administrative positions.

Tips for breaking in
- Obtain a co-op, internship, or part-time position related to bioinformatics
- Develop strong communication skills
- Maintain good grades
- Take a variety of mathematics, computer, and biology courses
- Be flexible

Earnings
Starting salaries in the USA range between $60,000 and $90,000 for professionals with two to four years of experience.

Types of Employers
- Pharmaceutical Companies
- Federal Government
- Clinical Research Firms
- State Government
- Biotech
- Universities
- Genetic Research Firms

Example of employers
- Cancer Research Institute
- Stanford University
- Data Management
- Astex Therapeutics
- Johns Hopkins
- Jackson Laboratory
- Merck
- National Institute of Health
- Eli Lilly
- Celera Genomics
- Agilent Laboratories
- Almec Diagnostics

Desirable qualities, interests, and skills
- Fairly deep background in some aspect of molecular biology. It can be biochemistry, molecular biology, molecular biophysics, or even molecular modeling, but a core of knowledge of molecular biology is imperative
- Understanding the central dogma of molecular biology
- Substantial experience with at least one or two major molecular biology software packages, either for sequence analysis or molecular modeling. The experience of learning one of these packages makes it much easier to learn to use other software quickly
- Comfortable working in a command-line computing environment, such as Linux or Unix
- Experience with programming in a computer language: Java, Unix, C, C++, RDBMS such as Oracle and Sybase, CORBA, Perl or Python, CGI and web scripting

Associations
- American Academy of Veterinary Informatics
- International Medical Informatics Association
- International Association for Computational Biology
- Psychiatric Society for Informatics
- American Telemedicine Association

Websites
- The International Neuroinformatics Coordinating Facility
- www.neuroinf.org
- American Nursing Informatics Association
- www.ania.org
- American Medical Informatics Association
- www.amia.org
- Bioinformatics.org http://bioinformatics.org
- Association for Veterinary Informatics http://avinformatics.org
- Society for Computers in Psychology
- http://colab.ltmemphis.org/scip
- Bioplanet www.bioplanet.com

Sample Job Titles
- Mass Spectrometry Specialist
- Biostatistician
- Senior Bioinformatician – Microarray Data Analysis
- Software Engineer
- Bioinformatics Project Manager
- Research Scientist
- Director of System Architecture
- Computational Biologist/Geneticist
- Bioanalytical Scientist
- Bioinformatics Application Developer