Chapter 7
Developing a Library Collection in Bioinformatics:
Support for an Evolving Profession

Victoria Martin
George Mason University, USA

ABSTRACT

This chapter provides guidelines for developing a university library collection for bioinformatics programs. The chapter discusses current research and scholarly communication trends in bioinformatics and their impact on information needs and information seeking behavior of bioinformaticians and, consequently, on collection development. It also discusses the criteria for making collection development decisions that are largely influenced by the interdisciplinary nature of the field. The types of information resources most frequently used by bioinformaticians are described, specific resources are suggested, and creative options aimed at finding ways for a bioinformatics library collection to expand in the digital era are explored. The author draws on literature in bioinformatics and the library and information sciences as well as on her ten years of experience providing bioinformatics user services at George Mason University. The chapter is geared towards practicing librarians who are charged with developing a collection for bioinformatics academic programs as well as future librarians taking courses on collection development and academic librarianship.

INTRODUCTION

To date, little research has been conducted on developing library collections in bioinformatics. The author aspires to fill this gap by offering a broad summary of collection development principles and practices as seen from the perspective of a liaison librarian for whom collection development is just one component of her job. The uniqueness of such a perspective lies in the fact that liaison librarians bring to collection development decisions not only their subject expertise but also their knowledge of the specialized needs of faculty and students within their assigned departments. Liaison librarians are also in a good position to involve faculty with collection development decisions to ensure

that the needs of all faculty and students are being met. Because of their direct experience with library patrons, liaison librarians are also able to provide insight into the information seeking patterns of the users that will assist in building a more balanced and meaningful collection.

The first section of this chapter describes current trends in bioinformatics study, teaching, and research that span several disciplines and are largely driven by new technologies and innovative research methods. It also examines how these trends affect the information seeking patterns of bioinformaticians who rely on timely access to current research findings. Understanding of these patterns allows a librarian to formulate the best approaches for building a collection in bionformatics.

The next section describes the characteristics of a bioinformatics library collection, identifies the types of resources used most frequently by bioinformatics faculty and students, and suggests selection criteria of various library materials. Alternative scholarly communication models, such as open access, are discussed. Skills and competencies and educational and training opportunities that will help a bioinformatics librarian achieve greater success are described. The final section emphasizes that collection development in bioinformatics is a challenging but exciting task that is mainly learned on the job where true mastery comes with the experience of learning and doing. Specific resources are suggested in a Key Resources section at the end of this chapter.

BACKGROUND

Definition of Bioinformatics

There is no unified or comprehensive definition of bioinformatics in the existing journal and reference literature (Altman & Mooney, 2006; Buehler & Rashidi, 2005; Fenstermacher, 2005; Hancock & Zvelebil, 2004; Rédei, 2008; Tramontano, 2009)

and the perception of what bioinformatics means is still evolving. The challenge of defining bioinformatics is due to the constantly changing scope of the discipline, which encompasses many areas of study such as DNA sequence alignment and the analysis of protein structure and function, as well as to the blurring boundaries between bioinformatics and emerging research fields such as neuroinformatics and ecoinformatics. Although the definition of bioinformatics is still the matter of some debate, the underlying idea in these various definitions of this term is the overlapping of two main fields—biology (the study of life) and informatics (the science of processing data for storage and retrieval), hence giving rise to the name bioinformatics. For the purpose of this chapter, bioinformatics is defined in general terms as the application of computers and computational techniques for the interpretation of biological data.

Overview of the Field

Bioinformatics, sometimes referred to as computational biology or biological information science, is a rapidly growing research and academic field that draws on a range of disciplines, including biology, computer science, information technology, and mathematics (whether bioinformatics and computational biology are the same or distinct is still a matter of debate). Bioinformatics also utilizes computational techniques borrowed from the fields of artificial intelligence, statistics, and biochemistry. The combined strength of scientific collaboration among several disciplines has brought bioinformaticians closer to an understanding of living systems across multiple levels of biological organization and has improved their ability to understand the root causes of human, animal and plant diseases and to find new cures for them.

Though it dates back to the 1960s following the discovery of the DNA double helix, bioinformatics has emerged and gained recognition as a separate research field during the 1990s when

Related Content

Deep Convolutional Neural Networks in Detecting Lung Mass From Chest X-Ray Images
Arun Prasad Mohan (2021). *International Journal of Applied Research in Bioinformatics (pp. 22-30).*
www.irma-international.org/article/deep-convolutional-neural-networks-in-detecting-lung-mass-from-chest-x-ray-images/267822

Polarization-based Robot Orientation and Navigation: Progress and Insights
Abd El Rahman Shabayek, Olivier Moreland David Fofi (2015). *International Journal of Systems Biology and Biomedical Technologies (pp. 73-89).*
www.irma-international.org/article/polarization-based-robot-orientation-and-navigation/148684

Mining of Medical Trends Using Social Networks
Shruti Kohliand Sonia Saini (2016). *Biomedical Image Analysis and Mining Techniques for Improved Health Outcomes (pp. 164-182).*
www.irma-international.org/chapter/mining-of-medical-trends-using-social-networks/140489

Time-Aware Task Allocation for Cloud Computing Environment
Sushanta Meher, Sohan Kumar Pandeand Sanjaya Kumar Panda (2017). *International Journal of Knowledge Discovery in Bioinformatics (pp. 1-13).*
www.irma-international.org/article/time-aware-task-allocation-for-cloud-computing-environment/178603

Hybrid High-Performance Computing Algorithm for Gene Regulatory Network
Dina Elsayad, Safawat Hamad, Howida Abd-Alfatah Shedeedand Mohamed Fahmy Tolba (2024). *Research Anthology on Bioinformatics, Genomics, and Computational Biology (pp. 968-982).*
www.irma-international.org/chapter/hybrid-high-performance-computing-algorithm/342558