The Bioinformationist: NCIBI and the Health Sciences Libraries

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Bioinformationist Defined

Bioinformationists are "information specialists who have received graduate training and practical experience that provides them with disciplinary background both in biomedical, behavioral or biological sciences and information sciences/informatics" as defined by the National Library of Medicine (NLM).[1] Informationists or "information specialists in-context" are able to provide a unique perspective in the acquisition, analysis and management of discipline specific information resources. NLM strongly advocates the integration of information professionals into the priority discipline of biomedical studies in order to improve research and decision outcomes.

The Bioinformationist Community

Informationists are widely employed across the United States. These individuals are often supported by a health sciences library although some also are funded by biomedical centers and institutes. Their educational backgrounds vary but generally include specialized undergraduate or graduate health science related degrees and/or professional bench science or clinical experience which has imbued them with the necessary subject expertise for the centers that they support.

- The NIH (National Institutes of Health) Library has 14 biomedical librarians/informationists on staff [2]
- The National Center for Biotechnology Information (NCBI) has a Technical Information Specialist who provides training and research support
- NLM supports the training of informationists through their Individual Fellowship for Informationist Training (F7) (PAR 06-509) award which prioritizes several areas of study including biomedical research and education
- The Medical Library Association (MLA) devoted a special focus issue of the Journal of the Medical Library Association in July 2006 to the support services provided by bioinformationists/information specialists/informationists in medical and health sciences libraries for bioinformatics research

Selected Examples of Bioinformationists[3]

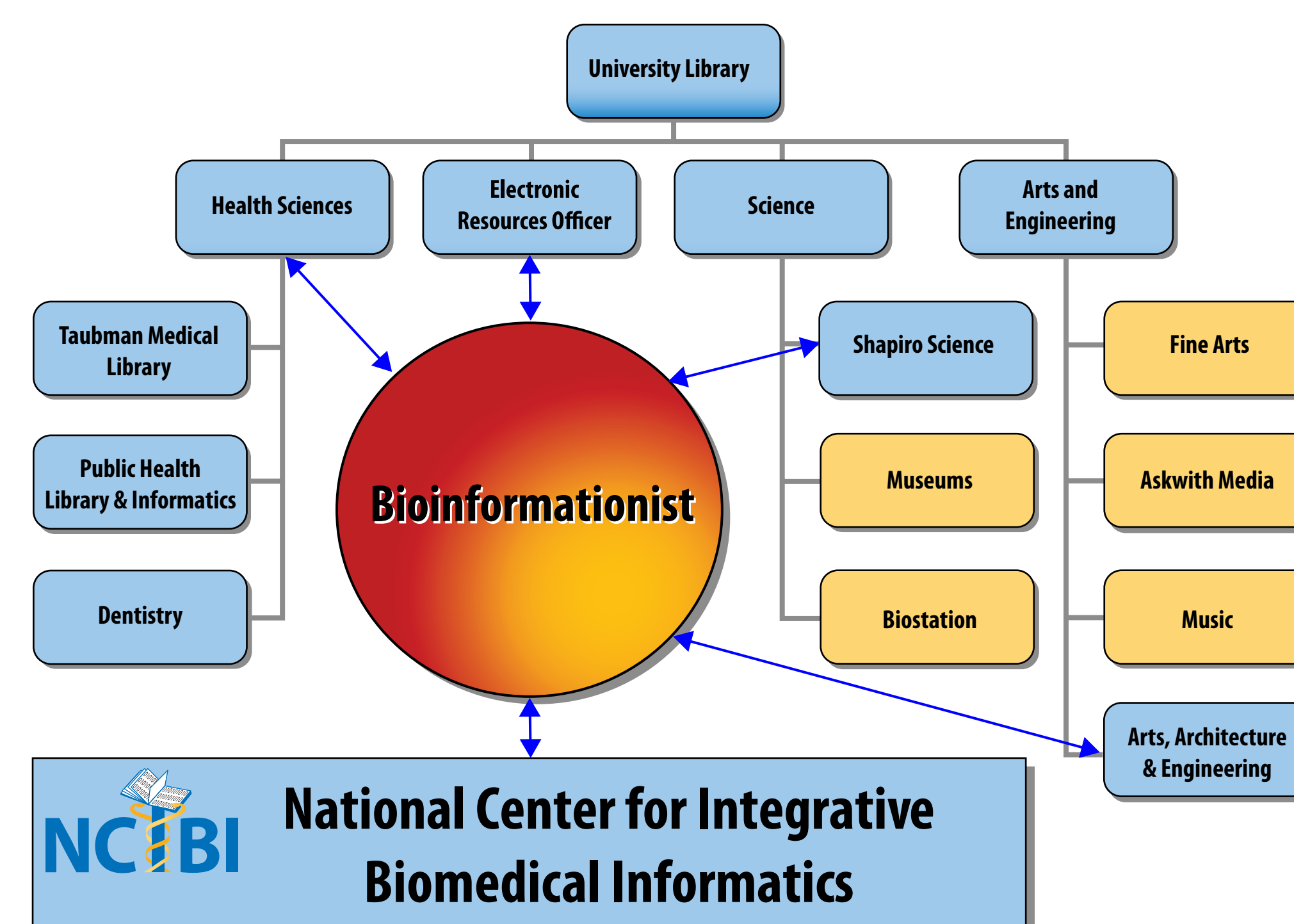| Institution	Title	Year Hire	Education	Services Offered
Cornell University	Bioinformatics and Life Sciences Specialist	2004	Ph.D.	• Workshops • Lectures • Consultations
Purdue University	Molecular Biosciences Specialist	2002	Ph.D., MLS	• Bioinformatics Week • Creation of Purdue Libraries' Bioinformatics Initiatives Group
Stanford University	Bioresearch Informationist	2006	Ph.D.	• Web portal • Workshops • Collection development of commercially available molecular biology and genetics databases • BioFAQs • Bioinformatics Week
University of Florida	Bioinformatics Librarian	2001	Ph.D., MLIS	• Workshops • Lectures • Consultations • Outreach
University of Pittsburgh	Information Specialist in Molecular Biology and Genetics	2002	Ph.D.	• Web portal • Workshops • Lectures • Consultations • Collection development of commercially available molecular biology and genetics databases • Outreach
University of Southern California	Bioinformatics Specialist	2005	Ph.D.	• Workshops • Lectures • Consultations
University of Utah	Bioinformatics Information Specialist	2001	Ph.D.	• Workshops • Consultations • All services delivered through distance education via Web with specialist residing in Germany
University of Washington	BioResearch Liaison	2002	Ph.D.	• Web portal • Workshops • Lectures • Consultations • Collection development of commercially available molecular biology and genetics databases • Outreach outside of university

University of Michigan Pilot

The growth of molecular information in the biomedical, clinical, and public health disciplines to discover novel scientific research is well illustrated by the exponential increase in the number of databases, data sets, tools and software being used to store, retrieve and analyze proteomic, genomic, and metabolomic data. Through the collaboration of the National Center for Integrative Biomedical Informatics (NCIBI) and the Health Sciences Libraries (HSL) at the University of Michigan, a four month pilot position, the Informationist, was created to provide a proof-of-concept model for a viable information professional position that would increase the quality and breadth of research support for the basic sciences and informatics at the university. Tangible outcomes for this pilot were provided in the areas listed in the Outcomes section of this poster. These outcomes support the recommendations made for a permanent bioinformationist position at the University of Michigan.

Objectives

- To serve as the primary liaison for the NCIBI
- To serve as a liaison for the molecular biology and genetics subject specialties in the HSL
- To evaluate existing bioinformationist programs and develop an implementation plan for a permanent position at the University of Michigan

Needs Assessment

Much initial time investment during the pilot was spent on needs assessment. The informationist met with core NCIBI staff including the center's project manager, senior scientific directors/core leads, and senior developers in order to gain an understanding of the work being conducted at the center and to determine where the informationist skills could provide effective contributions. In addition, the informationist made contacts with the librarian for biological sciences, the librarian for electrical engineering/computer science, and the Electronic Resources Officer (ERO) of the University Library in order to facilitate future collaborations between NCIBI activities and the resources for which these individuals maintained expertise. Establishing appropriate collaborative relationships was vital in making the informationist an integral team member within the center and the library system.

Outcomes

Citation Analysis
Ongoing citation analysis on traditional, published literature and non-traditional publications such as programming libraries crediting the NCIBI grant numbers is being conducted; a report on research productivity measures was created

Specialized Literature Searching
Focused literature searches are being developed to be delivered as an RSS feed to the NCIBI portal to provide the most current information on specific bioinformatics research trends.

Classification Schema
Creation of a meaningful classification schema for the center's publications, tools, and technology seminars for organization on the center's portal is under development.

Library Resource Consultation
Provided information on library resources such as full-text article acquisition through MGetIt button, journal impact factor analysis using Thomson Scientific's Journal Citation Reports, and facilitating deposits of research materials into the library's Deep Blue repository

Publicity
Working with human genetics HSL liaison to publicize NCIBI tools during the in-house NCBI provided short course training in Fall 2007 and continuing the NCIBI Annual Research meeting poster session at Taubman Medical Library

Current Awareness
Relay current event news on open source data management such as BIND (Biomolecular Interaction Network Database) acquisition by Thomson Scientific

Usability
Volunteering library resources for usability testing of NCIBI tools such as MiSearch, the automated profile learning bibliographic search tool and suggesting relevancy testing for tools using literature search results based on MeSH (Medical Subject Headings) with the "major" qualifier added

Data Acquisition
Ongoing negotiations with the Electronic Resources Officer to acquire additional full-text data sets for natural language processing (NLP) development from targeted publishers such as Elsevier and Nature Publishing Group

Recommendations

The pilot informationist position created at the University of Michigan has produced tangible evidence that a bioinformationist position would be beneficial for the bioinformatics research community at the university. NLM also has placed a high priority on these types of information professionals. Many other research organizations already have a bioinformationist in place to support the needs of their scientists and have clearly demonstrated the high demand of their services.

1. A permanent, dedicated informationist or bioinformationist or information specialist in bioinformatics position should be created at the University of Michigan.
2. The qualified person should hold in the least an undergraduate degree in a basic science that supports bioinformatics research such as biology, molecular biology, or genetics.
3. A collaborative bioinformatics informationists interest group that includes the diverse areas of the health sciences, basic sciences, and engineering sciences should be created to support the bioinformatics research goals of the university.

References

1 NLM Individual Fellowship for Informationist Training (F37) (PAR 06-509). http://grants.nih.gov/grants/guide/pa-files/PAR-06-509.html
2 Informationists. NIH Library. http://nihlibrary.nih.gov/LibraryServices/Informationists.htm
3 Geer, RC., Rein, DC. Building the Role of Medical Libraries in Bioinformatics. J Med Libr Assoc. 2006; 94(3): 284-285.

Acknowledgements