

Introduction


Bioinformatics methods are becoming part of the standard toolboxes of Life Science laboratories. Wisely applied, these approaches can enormously restrict the experimental work and complement the results obtained by “wet” methods. While many bioinformatics methods and protocols are not mature enough to be used by non-bioinformaticians (in terms of implementation, or easiness of the interpretation of the results), many others are already at a stage in which they can be used by non experts. They can be accessed through standard web interfaces from any computer irrespective of its hardware or operative system, they do not require the installation/maintenance of specific software, and their results are easy to interpret and generally presented in a graphical interactive way. In spite of this, our experience shows that many wet labs are not aware of many of the tools freely available.

This book covers these tools that work with information related to proteins. Only the tools fulfilling the type of requirements mentioned above are included. For example, tools requiring the installation of software, or the pre/post processing or parsing of the input or the results are discarded. While the book tries to be exhaustive in covering all aspects related to proteins (from genomic sequences to protein networks, going thorough protein sequences and three-dimensional structures), the number of tools commented in each category is necessarily restricted, and many tools with similar goals are not commented. This selection, personal and biased by definition, is based on our own experience working in a Protein Analysis Facility of a Molecular Biology research centre.

The point of view of the book is totally practical. This is not intended to be an introductory textbook on Bioinformatics. The theoretical bases of the tools are only tangentially mentioned as long as such knowledge is required to better interpret the results. We try to explain the usage of the tools in a similar way protocols are described in Molecular Biology books. Practical examples with real proteins are included in the different sections.

Since the field is moving very fast and many tools get improved, are surpassed, or the web addresses change or simply disappear, the book is associated to a dynamic web site that will try to reflect these changes. This site will maintain an updated list of the tools and include information on their eventual upgrades and changes. This site can be accessed at <http://csbg.cnb.csic.es/PB/>.

For each tool discussed, a table with the following information is included:

Tool name and description	Original URL	QR code
ReadSeq – Conversion between various sequence file formats	http://www.ebi.ac.uk/Tools/sfc/readseq/ http://csbg.cnb.csic.es/PB/E1010	
	Permanent URL	

The table contains the name and a short description of the tool, as well as its current web address (URL). A “permanent” URL is also included. Right now that is just an automatic redirection to the original URL of the tool. But in case that original URL changes or disappears, the permanent URL will reflect that, providing information on the change, proposing alternative tools, etc. Finally, the table contains a “quick response” (QR) code that can be scanned so as to automatically point the device browser to the permanent URL. The bibliographic references of the tools are also included so that interested users can obtain more information.

An index with the tools, as well as “How to...?” index have also been included to facilitate localizing the procedure/tool of interest.

Finally, we would like to acknowledge the developers of these tools, who are investing their time and resources for creating and maintaining a large ecosystem of interconnected web applications that facilitates the daily work of molecular biologists.

Practical Protein Bioinformatics

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