Online bioinformatics tools

There are already thousands of online bioinformatics resources available, with undoubtedly many more to come. One of the limiting factors of the field is the difficulty in navigating the vast array of resources to identify the most appropriate tool(s) for what you need to do, whether that's finding information on SNPs, locating pathway analysis software, or designing PCR primers. Here are four websites that will help you with your search.

The OBRC contains links and annotations for over 2,000 bioinformatics databases and software tools. It was created in 2006 by the Molecular Biology Information Service for the Health Sciences Library System at the University of Pittsburgh and can be accessed from their webpage via search.HSLS.MolBio. The purpose of the manually curated OBRC is to bridge the gap between the rising information needs of biological and medical researchers and the rapidly growing number of online bioinformatics resources. This freely available, searchable database arranges resources by categories and sub-categories such as Structure Databases and Analysis Tools, Proteomics Resources, and Enzymes and Pathways. The OBRC is the largest online collection of its kind and the only one with advanced search results clustering. It is a one-stop guided information gateway to the major bioinformatics databases and software tools on the Web. Full disclosure: although I didn't create the OBRC, I am currently its curator. Feel free to contact me if you have any questions or suggestions.

BioMed Central Databases

The BioMed Central Databases maintains a catalog of Web-based databases as well as a Biology Image Library. The collection can be browsed by subject area or searched by name, description, contents, and/or subject area. The scientific community is welcome to create a database or simply house it on the BioMed Central Databases site.

OReFiL

OReFiL is the Online Resource Finder for Lifesciences. Developed by computational biologists, it provides searches for online resources introduced in peer-reviewed papers in the life sciences. A crawler automatically extracts all URLs listed in MEDLINE abstracts and full-text papers from BioMed Central open-access journals and maintains them in a freely available, searchable database.

Nucleic Acids Research Bioinformatics Links Directory

The Bioinformatics Links Directory features curated links to molecular resources, tools, and databases culled from the annual Database issue and Web Server issue of the journal Nucleic Acids Research (NAR). NAR is a highly ranked open access journal that publishes articles on the biological, biochemical, physical, and chemical aspects of proteins and nucleic acids involved in nucleic acid interactions and/or metabolism. The freely available Bioinformatics Link Directory provides links to the resources themselves, as well as to the NAR published articles about those resources.

Glial fibrillary acidic protein (GFAP) might play an important role in the aggressiveness of GBM and also contributed to its poor overall survival. A study aimed to test (1) the associations between GFAP single nucleotide polymorphisms (SNPs) and GBM cells chemoresistance and metastasis, and (2) the molecular mechanism accounting for their effects. Four tagging SNPs of GFAP were initially genotyped in 667 subjects and the significant SNP was further analyzed via online bioinformatics tools. SNP

rs11558961 was found to be significantly associated with GBM susceptibility. It was predicted to influence microRNA(miR)-139 binding to 3'UTR of GFAP gene. In functional experiments, we found that cells transfected with rs11558961 G-allele constructs had lower baseline luciferase activities and were more responsive to miR-139 changes, compared to C-allele constructs. Moreover, rs11558961 C>G variant reduced the chemoresistance of GBM cells and migration capability. In conclusion, rs11558961 might influence the chemoresistance and progression of GBM cells via promoting the binding of miR-139, ultimately decrease the susceptibility of GBM. This investigation will shed light on the optimizing for clinical trial design and individualizing of therapeutic plans [1].

1)
Wang J, Wang ML, Wang CH, Sun SY, Zhang HB, Jiang YY, Xu QW, Wang Y, Gu SX. A novel functional polymorphism of GFAP decrease glioblastoma susceptibility through inhibiting the binding of miR-139. Aging (Albany NY). 2018 May 10. doi: 10.18632/aging.101442. [Epub ahead of print] PubMed PMID: 29746255.