

À la Bioinformatics

Since its humble beginning, the definition of "bioinformatics" has metamorphosized from the original—and in many ways, naive—definition of "data collection, analysis and dissemination" to a current more encompassing definition found in literature. Its domain of application has widened from being a special niche tool to that of an essential corporate technology. The scope has also widened from a laboratory-based tool to an integrated corporate infrastructure.

For years after its introduction, a recurring issue that regularly popped up is the definition of bioinformatics, particularly from individuals who were trying to get into the field. Most lamented that there are too many definitions of bioinformatics. This was a consequence of the expanding scope of the subject. As both an enabling and enabled discipline, it has been defined differently depending on the domain of expertise of the person who is giving the definition: A computer scientist will give one definition, a biologist another, a biotechnologist a different version, and an individual from a pharmaceutical company will provide yet another variant.

Each definition is as good as the other; this is just the nature of the beast. The

important point to note is that bioinformatics is an enabling and an enabled discipline. As such it will never replace the bench work and wet lab experiments of the biological, biochemical, health and clinical sciences. It only helps the areas it is being applied in to

- Eliminate unlikely candidates (such as in drug target discovery);
- Interrelate data and information (such as in analysis);
- Extrapolate into regime inaccessible by experiments (such as in cases not possible with current state of the art of the technology);
- Study cases that will be unethical to do (such as those studies that will be too invasive to the human body);
- Etc.

Thus it would be unwise, particularly for bioinformaticists, to just write the best computer software, or to just integrate the most sophisticated packages to churn out numbers and beautiful graphics. The bottom line is still the biology, the biochemistry, and the healthcare system. Nothing, not the best software, nor the most sophisticated package, shall replace real life systems.

Now the Enabling Einformatics

Einformaticists already exist. Examples are the superb global warming modelers at NASA, Jet Propulsion Lab (JPL) and at various universities, or the group of tireless people, including the Intergovernmental Panel on Climate Change (IPCC), with former U.S. vice president Al Gore as its messenger. The latter two are co-laureates of the 2007 Nobel Peace prize. These people have been working in Einformatics, without even knowing it.

A definition of bioinformatics is the study of information content and information flow in biological systems and processes. Einformatics can be defined, in a manner analogous to bioinformatics, as the study of the information content and information flow in energy systems and processes. So what is the big deal? Historically, every discipline started as seemingly disparate areas until a coordinated effort to integrate the fragments into one with a common, central focus, either by combining different disciplines or using a common tool. No discipline ever started from vacuum; even Sir Isaac Newton stood on the "shoulders of giants."