

The Human Genome and Disease

After much work, the draft of the human genome was announced with much fanfare in February 2001. This event was viewed as one of the greatest achievements in modern science. The human genome was supposed to be the key to finding cures to many diseases. It's now more than 5 years later, so what's happened? Where are all the cures that were supposed to have been developed?

The problem isn't that the human genome (and other genomes) are uninformative, but rather that the scope of many biological processes and problems are very large. They involve a high degree of complexity and interconnectedness. Take for instance the latest depiction of some known human proteins and the binary interactions that exist between them (shown below in Figure 1). How can one make sense of something like this?

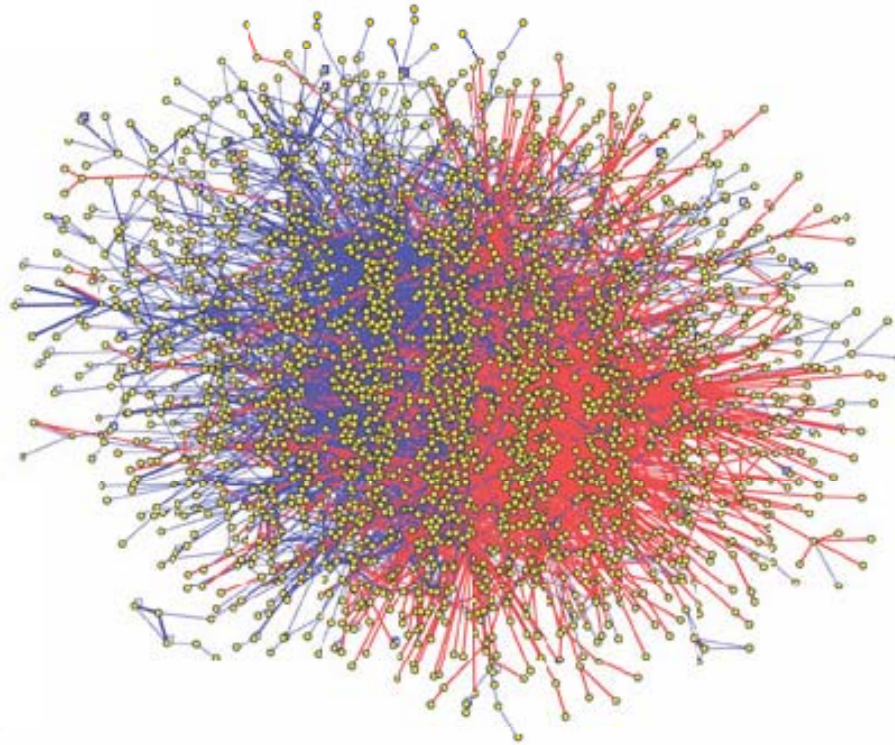


Figure 1. Network graph depiction of 2,784 proteins (yellow circles) and the interactions between them (lines). From Rual et al., Nature 2005 437(20): 1173-1178.

In our current state, one of the biggest impacts that genome projects, such as the human genome, have made is in promoting a change in perspective and approach to biological problems. Since mapping of causes to effects in a biological setting must account for biocomplexity, new analytical methods are needed. Thus, the completion of the human genome did not mark an end point where all of our biological questions would be answered, but rather a starting point for new questions. Now that we have a starting point in genomic information, where do we go from here? How can we best use this information to learn more about biology?