Deciphering The Genetic Code O Essay, Research Paper

I ll be the first to admit it, I m a skeptic of the worst kind; it s just my nature, I guess. So, I guess it goes without saying that I m not impressed with all the recent hype about the Human Genome Project. People have gone so far as to hail the HGP as the cure for all of mankind s ails. Even with advance technology that allows scientists to map the genome sequence of a human being, we have failed to find a cure the common cold. And yet, scientists feel confident that the tools needed to treat genes involved in diseases will likely be developed within the next twenty years. My response I ll believe it when I see it. While I do not dispute of importance of this project and its ability to revolutionize biological research and medicine, I chose to look at a similar project that has had a significant impact on agriculture the completion of a plant s genetic map.

In 1996, a $70 million dollar project was started to map the genetic sequence of a plant. Drawing heavily on research done by the HGP, scientists on three continents worked in collaboration on the project, which was completed this past December. The complete genetic code of Arabidopsis thaliana was published in the December issue of the scientific journal, Nature.

Researchers working the United States, Great Britain, France, Germany, and Japan selected Arabidopsis thaliana, a member of the mustard family and a cousin to the cauliflower plant, over approximately 250,000 other species because the weed, more commonly known as thale cress, contains all the chromosomes of a more complex plant but is biologically simple. Each plant has 25,000 genes located on 5 genes; these genes contain about 117 million chemical base pairs (corn, on the other hand, has about 3 billion base pairs). In addition to its relative biological simplicity, the plant grows quickly, producing as many as eight generations in a single year.

Many individuals may question the need to spend $70 million dollars on a plant, however, the release of Arabidopsis thaliana s genetic code has already had an impact on agriculture in the US and other parts of the world. Geneticists have already been successful in using information gleaned from Arabidopsis project to develop crops that grow faster, are climate adaptable, resist pests, and offer greater nutritional value. Replacing current crops with these tailor-made crops will prove to be more cost effective in the long run; in addition, these crops significantly reduce the need for chemical pesticides and save millions of acres of rainforest land. Scientists also predict that using the genetic map of Arabidopsis thaliana, they will be able to produce renewable supplies of fuels and other industrial chemicals. Although, they admit, only time will tell. Research on plant-based fuels will begin sometime in the summer of 2001.

Perhaps the mapping of a plant s genetic code isn t as far-reaching as the potential impact of the HGP; nonetheless, it has proven to be significant in real world. Which is more than can be said for the HGP, so far. Call me old-fashioned, but somehow I worry about the potentially disastrous effects of abolishing all genetic diseases. Will we not make mutants out of those who are currently suffering from genetic diseases, or those who s families couldn t afford to get them fixed , so to speak? Growing up with an adopted brother who suffers from Down s syndrome, I have firsthand experience with a genetic disease. It saddens for me know that if this technology had come along 30 years ago, KC wouldn t be a part of my family today as he has brought an infinite amount of joy to each of our lives. While the future possibilities may seem endless, it s important to put the HGP into perspective by looking at the bigger picture.

Resources

Ross, Emma and Paul Recer. 2000. Genetic Map of a Plant Completed. Popular Science Magazine Online. http://www.popsci.com/scitech/features/plant.html. Accessed on 3/17/2001.

Mayo Clinic. 1999. Human Genome Project: Mapping Ourselves. Mayo Clinic Online. http://www.mayohealth.org/mayo/9908/htm/hgp.htm. Accessed on 10/12/00.