

The Human Genome Project



One of the biggest scientific research projects in history is the Human Genome Project (HGP). This is an attempt to map how the very basics of life fit and work together to create human DNA. Knowing this may help us better understand human evolution and could provide significant medical benefits, such as the development of molecular medicine.

The roots of the HGP are in late 1984 when several US government departments held a meeting to discuss the possibility of studying the human genome. They had hoped to use DNA analysis to examine possible genetic changes in atomic bomb survivors. The government approved the project in 1988. Two years later, *it* began in earnest as the government published a plan to map out the human genome over the next five years. The entire project was estimated to take fifteen years total to complete.

The project's *scope* was very wide and included international partnerships with many countries, including the United Kingdom, Japan, Australia, and France. The HGP was not only established for the purposes of strictly scientific research but also to examine the legal and ethical questions about the use of DNA. A separate program, ELSI (Ethical Legal and Social Implications) was launched in 1990 for this purpose. The HGP's other goals include developing and improving technology as well as collecting and managing information (often called bioinformatics).

The duration and scale of the HGP are not surprising, especially considering the complex nature of DNA sequencing. *This* is the process of understanding how DNA is arranged and organized at the atomic level. DNA contains the genetic information that determines how life develops. The basic units within DNA are base pairs of adenine, thymine, cytosine, and guanine. Because of the many millions of base pairs in human DNA and the limits of technology, DNA sequencing can take a long time to perform.

The HGP was completed in 2003. The first study about the HGP was published a year later. This indicated that the HGP was very accurate in its sequencing attempts. The genome sequence is freely available on the Internet for download. Although the project has finished, scientists have barely begun to grasp the practical and scientific implications of all this new information. It is possible that this could lead to potential breakthroughs in areas of medical research for disease prevention and cures. It may also shape how scientists examine issues in evolution. For example, they could use the HGP information to look into how life changed over millions of years at a molecular level.



- 1) According to the article, when did the US government approve the Human Genome Project?
 - a) 1984
 - b) 1988
 - c) 1990
 - d) 2003

- 2) The word “it” in paragraph 2 refers to:
 - a) the Human Genome Project
 - b) the government
 - c) a plan
 - d) the next five years

- 3) The word “scope” in paragraph 3 is closest in meaning to:
 - a) opportunity
 - b) scan
 - c) extent
 - d) device

- 4) According to the article, the human genome project:
 - a) is a strictly American project
 - b) is only aimed at mapping DNA
 - c) started the field of biometrics
 - d) is multinational and has many goals

- 5) What might be an example of an issue that concerns the ELSI?
 - a) the commercial sale and use of human DNA
 - b) the proper matching of DNA base pairs
 - c) how to get more funding for the project
 - d) getting government approval to study DNA

- 6) The word “this” in paragraph 4 refers to:
 - a) nature
 - b) the HGP
 - c) the atomic level
 - d) sequencing

- 7) What is the topic of paragraph 4?
 - a) The unique scientific process and technology involved in the HGP
 - b) Why the human genome project was such a significant undertaking
 - c) The basic structure of human DNA and how it works to develop life
 - d) Why the human genome project was important and its significance

- 8) Paragraph 5 implies that:
 - a) the full implications of completing the Human Genome Project are not fully known
 - b) human genes no longer need to be studied because scientists know everything about it
 - c) it is likely that the Human Genome Project will need to be restarted because it was a failure
 - d) international cooperation was very important to making the project a big success

Answers: 1. (b) 2. (a) 3. (c) 4. (d) 5. (a) 6. (d) 7. (b) 8. (a)

