

Your genome is a patchwork' "Genome: from generation to generation'

There are two main types of cells that make up our body: somatic cells and germ cells (sperm and eggs). When a sperm that has your father's genome and an egg that has your mother's genome fuse together, a newly combined pair of genomes is formed. This is going to be 'your genome. Moreover, the germ cells of your parents have genomes of your grandfather and grandmother recombined randomty. In this way, genomes are passed way, genomes are passed down from generation to generation.



genomes from different individuals Human genomes from different individuals differ by about 0.1%. Most of the human genome variations arise from SNPs, or Single Nucleotide Polymorphisms. A SNP is when a single nucleotide in the genome differs between humans. The human genome includes about 10 million SNPs. The combination pattern of SNPs is unique to each individual. In other words, each genome is unique. Characteristics such as diathesis and susceptibility to a certain disease are usually caused by both differences in genomes and environmental factors. Some traits such as the ability to metabolize alcohols and the twoe of enances and the type of earwax depend greatly on SNPs.

"Life history is in the gen The genome of an organism means its entire genetic information. The mechanism by which proteins are produced from genomic information is the same in all species. On the other hand, all organisms have genomes characteristic to their species, Humans have the "human" genome, dogs have the 'dog genome', and colon bacilli have the "colon bacillus genome". Genomes change over long periods of time and, in this way, organisms grow in diversity. Therefore, by studying differences in genomes among species, the evolutionary paths are revealed. The genomes of more than 600 organisms h



"Potentials of genome research" Daily life, medicine, industry

Daily me, inductine, inducts () The advancements in the genome projects are applicable in many different fields. Based on the information obtained in the projects, new technologies are developed. The new developments and technology are used to conduct research not only in the fields of disease treatment and new drug development but also agriculture, environment, and technology.

"Personalized medicine" People may or may not develop a certain disease, even if they are in the same environment. Moreover, the response to a drug varies between individuals. These differences seem to be caused by differences in the source of the source of the source of the source penetic information, Studies on the relation between SNPs and development of disease are underway, for example, a detailed study on the differences between SNP teams for fitselyte-related diseases. With the advancements in genomics, personalized medicine can be expected in the near future.

liodegradable plastics' e plastics that can be oken down into water and

producing plants.

CO2 by microorganise They are more environm friendly than ordina

plastics. It is now possible to improve manufacturing efficiency by modifying the genome of microorganisms enciency by modinying the genome of microorganisms that produce biodegradable plastics and to make biodegradable plastic-

oplication to agricult

"Modified rice"

Rice is one of the most important food grains in the world. Japan leads the world in the rice genome project. Studies on rice modification using the genetic information available are underway, for example, rice with high-yielding, salt-tolerant, lowallergenic, properties. Research and hay fever-reducing



gineering

'Nano bio-device'

In genomic studies and medicine, rapid analysis of DNA and proteins is necessary. To achieve these high potentials, nano bio-devices are needed for analyzers as they conform to organic molecules such as DNA and proteins. Applying this technique when making semiconductors, studies are carried out to make new nano bio-devices.

The Ethical, Legal, and Social Implications (ELSI) associated with decoding the human genome have been a major challenge for the international community. ELSI explores community. ELSI explores some of the issues surrounding the use of genetic information and discrimination based on genetic information.UNESCO adopted the "Universal Declaration on the Human Rights" in 1997, and the Japanese government adopted the "Ethical Guidelines for Human Genome and Gorie Analysis Remort and Gorie Analysis Important in Co. Los at sue ringeus the 15 st issing ELSI.