

Unravelling the Blueprint of Life

Roche and Genetics

Around the world scientists are working to unravel the mysteries of human genes and their role in health and disease. As one of the world's leading innovation-driven healthcare companies, Roche is at the forefront of this research, working both in-house and in partnership with other companies and organisations.

Genetics has formed the basis of much of the progress made in healthcare over the last decade or more. Roche's portfolio, for example, already includes a medicine targeted at breast cancer patients in whom a specific gene is abnormally active. We have also been working to enhance understanding of how different genotypes of the hepatitis C virus affect the length and type of treatment that patients need. Roche also supplies laboratories around the UK with equipment to test for genetic disorders.

Looking to the future, genetics will play an important role in how disease is diagnosed and treated. Our vision is of a future where healthcare is much more tailored to the individual than we can currently achieve. Realising that vision depends on a better understanding of what causes or contributes to disease and of peoples' different responses to treatment. Genetic research will provide much of that understanding.

Genes form the blueprint for all life, and each can occur in slightly different forms from person to person. Along with influences from our environments, these variations influence our likelihood of contracting certain diseases or being particularly resistant to them. Some may influence how we respond to treatments – whether we will benefit or we might suffer a side-effect.

Roche is excited by the potential of this work and we have become a world leader in genetics, genomics and proteomics. Our in-house capabilities include an independent research centre for medical genomics and we have forged strategic alliances with cutting-edge biotechnology companies such as Iceland's deCODE. Roche and deCODE's partnership has already identified or located the genes responsible for many common diseases.

Healthcare that is tailored to the individual will need the integrated use of highly specific diagnostic tools and treatments. As the world's leading diagnostic company and one of the leading pharmaceutical

companies, Roche is uniquely positioned to realise this potential. We plan to translate genetics knowledge into new diagnostics and eventually new medicines to tackle disease. This will help us achieve our goal of making a real difference in people's lives by improving human health and quality of life.

As we move towards this future, Roche is committed to supporting education on and stimulating dialogue about genetics. The Roche Charter on Genetics embodies our commitment to carrying out genetic research according to a set of well-defined ethical and philosophical principles. An external Science and Ethics Advisory Group provides Roche with guidance, advice and counsel on these issues.

Genetic facts

- Genes make up our DNA and are responsible for passing on characteristics from parent to child.
- Genetics is the study of how traits are transmitted from parent to offspring. Genomics is the systematic study of all genes and their comparison, in humans and other forms of life.
- Each human cell has the entire set of human genes - according to current estimates about 30,000-100,000 genes, giving rise to about 1,000,000 different proteins.
- The human genetic sequence is 98% identical to that of a chimpanzee, 95% identical to that of a mouse and even 60% identical to a banana.
- Humans differ from each other by only 0.1-0.2%, but these small differences are responsible for a substantial fraction of differences in personal characteristics.
- When printed, the gene sequence that comprises the genetic material of a human being consists of more than three billion DNA letters – equivalent to about 200 telephone directories.

