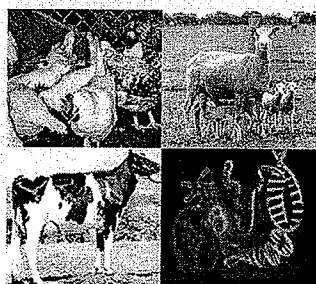


Brief genome revision



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IAEA, Korea, April, 2006

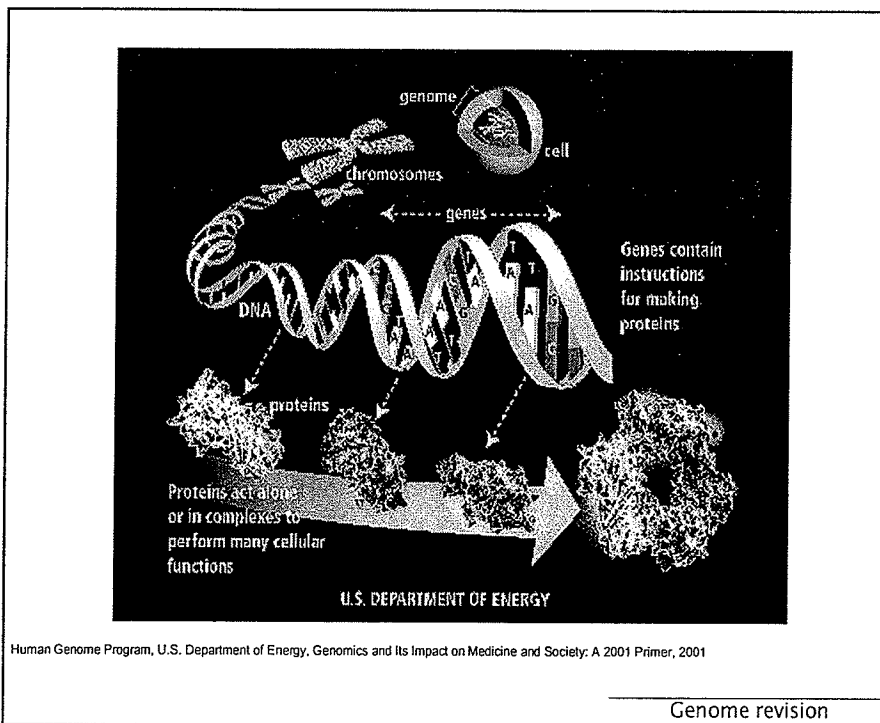

Revision

What is the 'central dogma' of biology?

What is the structure of a genome and a gene?

A few interesting facts from the human sequencing project.

Genome revision

Comparing genomes

Organism	Genome Size (Bases)	Estimated Genes
Human (<i>Homo sapiens</i>)	3 billion	30,000
Laboratory mouse (<i>M. musculus</i>)	2.6 billion	30,000
Mustard weed (<i>A. thaliana</i>)	100 million	25,000
Roundworm (<i>C. elegans</i>)	97 million	19,000
Fruit fly (<i>D. melanogaster</i>)	137 million	13,000
Yeast (<i>S. cerevisiae</i>)	12.1 million	6,000
Bacterium (<i>E. coli</i>)	4.6 million	3,200
Human immunodeficiency virus (HIV)	9700	9

U.S. Department of Energy Genome Programs, Genomics and Its Impact on Science and Society, 2003

Genome revision

Genome structure



More than half of the euchromatic genome consists of repeat sequences, with the vast majority (45 per cent) accounted for by repeats derived from 'parasitic DNA', called transposable elements or transposons

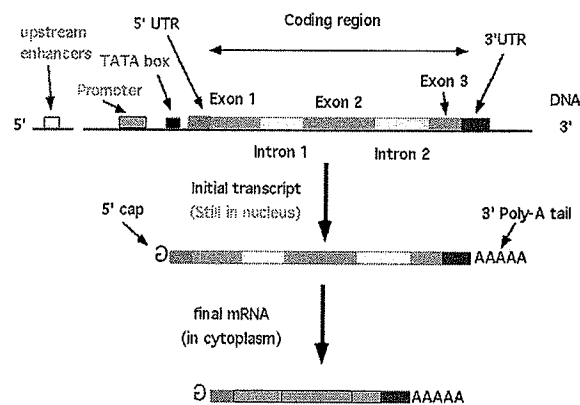
Actual exons take up as little as 1 per cent of the genome, while introns account for 24 per cent.

<http://www.wellcome.ac.uk/en/genome/thegenome/hg01f007.html>

Genome revision

Organisation of a gene

Eukaryotic gene structure: Pol 2 gene (protein coding genes)



<http://nitro.biosci.arizona.edu/courses/EEB600A-2003/lectures/lecture24/lecture24.html>

Genome revision



What does the draft human genome sequence tell us?

By the Numbers

- The human genome contains 3 billion chemical nucleotide bases (A, C, T, and G).
- The average gene consists of 3000 bases, but sizes vary greatly, with the largest known human gene being dystrophin at 2.4 million bases.
- The total number of genes is estimated at around 30,000--much lower than previous estimates of 80,000 to 140,000.
- Almost all (99.9%) nucleotide bases are exactly the same in all people.
- The functions are unknown for over 50% of discovered genes.

U.S. Department of Energy Genome Programs, Genomics and Its Impact on Science and Society, 2003

Genome revision