

synthesis during translation. It has sites for amino-acid attachment and *codon* (a particular sequence of 3 bases) recognition.

The codon recognition is different for each tRNA and is determined by the *anticodon* region, which contains the complementary bases to the ones encountered on the mRNA. Each tRNA molecule binds only one type of amino acid, but because the genetic code is degenerate, more than one codon exists for each amino acid.

Both coding (exons) and non coding regions (introns) exist on RNA. Reverse transcription involves transcription of RNA to DNA (used by retroviruses).

Only about 5% of DNA codes for proteins.

Multiple codons (triplets of nucleotides) code for the same amino acid.

Antisense oligonucleotides are sequences of DNA which are complementary to RNA. They bind to RNA and stops it from processing.

PCR

In PCR, two primers are required for a start and stop sequence to amplify the DNA strand.

DNA polymerase needs to be stable at high temperatures and hence thermostable enzyme from *T. aquaticus* is used. The mixture is heated to below 100°C

DNA polymerase causes synthesis of DNA between two primers.

Reverse transcriptase PCR is used to amplify RNA, whilst conventional PCR is used to amplify DNA

Restriction enzymes cut DNA at nucleotide sequences specific to each restriction enzyme. *Hind III* and *EcoRI* are examples of restriction enzymes

DNA ligase and **polymerase** are involved in joining and linking DNA together.

Plasmids are circular molecules of bacterial DNA separate from the bacterial chromosome. They are usually small, consisting of a few thousand base pairs. They carry one or a few genes and have a single origin of replication.

A **Barr body** is an inactivated X chromosome.

The human karyotype consists of 22 pairs of autosomes and 1 pair of sex chromosomes totalling 23 pairs altogether.

Heterochromatin contains mostly inactivated genes.

Telomeres are distal extremities of chromosomal arms but **centromeres** provide a point of attachment for the mitotic spindle.

Northern blotting detects RNA

Southern blotting detects DNA.

Western blotting can be used to detect and quantify proteins