Understanding Genome Coordinates

Genome coordinates are a standardized way to describe the location of specific sequences—such as genes, exons, or mutations—on a reference genome. They are essential for genomic research, diagnostics, and bioinformatics.

Genome coordinates specify:

- ✓ Chromosome: e.g., chr1, chrX
- ✓ Start position: where the feature begins
- ✓ End position: where the feature ends
- ✓ Strand: whether the feature is on the forward (+) or reverse (−) DNA strand

Example: chr7:117199644-117199711 (+) This means the feature is on chromosome 7, from base 117,199,644 to 117,199,711 on the forward strand.

Types of Coordinate Systems

- ➢ Absolute genomic coordinates: Refer to positions on the entire chromosome.
- ➢ Relative coordinates: Used within specific regions like genes or transcripts.
- ➢ Graph coordinates: Used for visualizations, such as genome browsers.

Mapping Between Systems

Tools like Ensembl and UniProt allow mapping between:

- Genome coordinates
- Transcript coordinates (mRNA)
- Protein coordinates (amino acid positions)