

Genetics and Development



The structure of an organism's genome and the way in which the genetic information is interpreted is central to life.

How the DNA sequence of the genome is read underpins development, differentiation and the functioning of cells. This Research Domain encompasses studies on crucial aspects of the way in which the expression of the genome is correctly regulated, how genome integrity is maintained in the face of potential damage during replication or from environmental insults, and how errors in these processes can lead to disease.

Research Themes include fundamental investigations on DNA replication, chromatin structure and its regulation, epigenetic regulation of gene expression, and the mechanisms of DNA damage and repair.

These investigations are carried out in the context of stem cell biology, cancer and a variety of developmental processes, utilising model organisms ranging from *Drosophila* and zebrafish through to mice, and human cells, both normal and from patients with specific diseases such as inherited disorders of genome stability and cancers of the blood.

Research themes

- [Genome Biology \(/research/activity/mds/domains/genetics-development/genome-biology/index.aspx\)](/research/activity/mds/domains/genetics-development/genome-biology/index.aspx)
- [Epigenetics \(/research/activity/mds/domains/genetics-development/epigenetics/index.aspx\)](/research/activity/mds/domains/genetics-development/epigenetics/index.aspx)
- [DNA Replication \(/research/activity/mds/domains/genetics-development/dna-replication/index.aspx\)](/research/activity/mds/domains/genetics-development/dna-replication/index.aspx)
- [DNA Damage and Repair \(/research/activity/mds/domains/genetics-development/dna-damage-repair/index.aspx\)](/research/activity/mds/domains/genetics-development/dna-damage-repair/index.aspx)
- [Stem Cell Biology \(/research/activity/mds/domains/genetics-development/stem-cell-biology/index.aspx\)](/research/activity/mds/domains/genetics-development/stem-cell-biology/index.aspx)