**Cancer Biology: Cancer cell analysis practicals**

**Dr Aindrias Ryan, November 2021**

Breast cancer is the most common cancer in the United Kingdom with around 55,000 women diagnosed each year.

The study of breast cancer cell lines *in vitro* is important for a better understanding of mechanisms involved in carcinogenesis and how cancer cells will respond to clinical interventions such as chemotherapy.

In the cancer biology series of practicals, final year Medical Biology students examined the differences in a protein called Caspase-3 that is involved in apoptosis. Loss of control over apoptosis is important in cancer as it allows cancer cells to persist for longer. These differences were examined in both cancerous breast cancer cells (MCF-7) and non-tumorigenic breast cells (MCF-10a).

Students examined both the differences in the CASP3 gene that encodes Caspase-3 by using the polymerase chain reaction (PCR) and at the protein level using Western blotting which probes for proteins such as Caspase-3 using antibodies.

By the end of the practical series, students were able to appreciate the differences between Caspase-3 in the two cells lines, the importance of mutations in altering a protein such as Caspase-3 and the possible consequences of mutated proteins in the development of breast cancer.