



Cancer Research Wales aims to reduce the impact of cancer on the people of Wales through supporting world class cancer research and education. Because more than 40,000 people are diagnosed with colon cancer in the UK each year, at CRW we believe it is important to:

- Learn more about the patho-biology of colon cancer in order to develop new therapies and treatment strategies.
- Improve the use and effectiveness of conventional treatments and newer targeted therapies in colon cancer and identify markers of treatment response.
- Reduce the risk and burden of metastasis.
- Understand how and why some colon cancer patients develop resistance to treatment in order to help devise strategies that can circumvent the problem.



Cancer Research Wales Ymchwil Canser Cymru

all money raised is spent in Wales



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Colon cancer (also known as colorectal cancer or bowel cancer) is the third most common cancer in the UK, after lung and breast cancer. In Wales alone, there are approximately 1,200 new cases diagnosed each year. Encouragingly, survival rates for patients with colon cancer have increased steadily over the last few decades, research plays a big part in this achievement. Cancer Research Wales (CRW) fund a number of ground-breaking research projects for colorectal cancer which seek to:

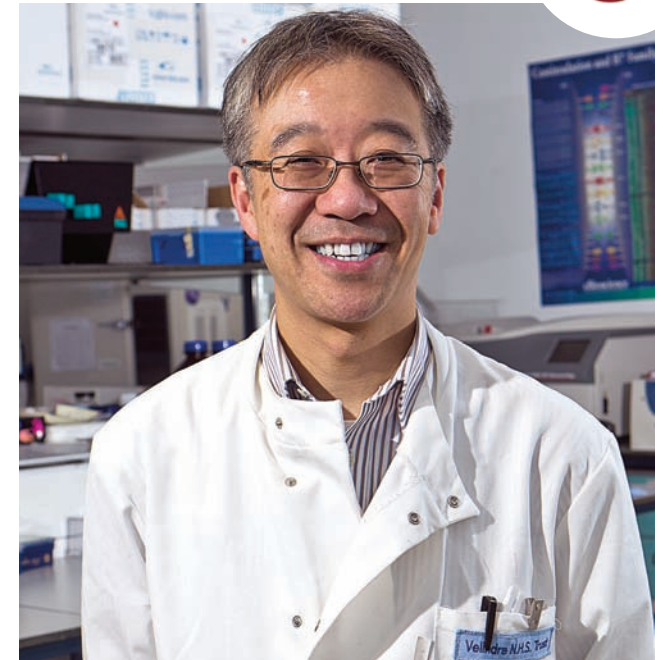
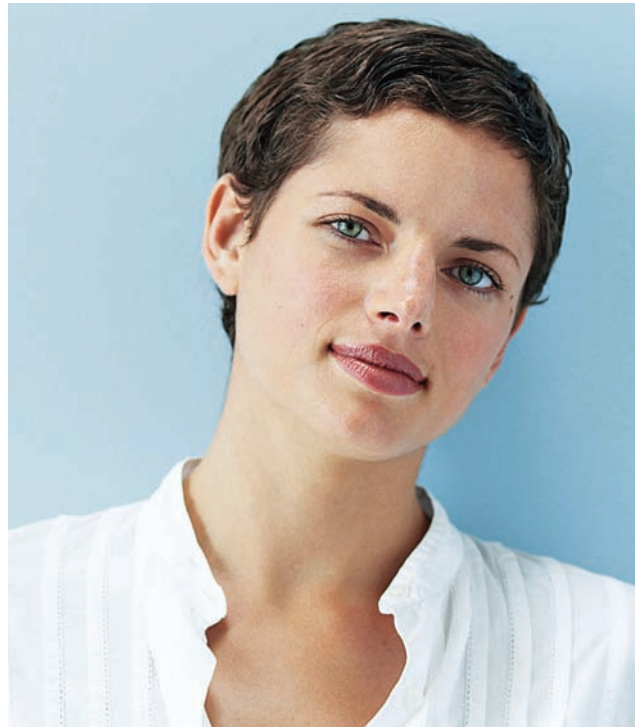
-  Discover gene and gene combinations in colon cancer patients that better predict favourable responses in patients treated with either existing or one of the new and emerging therapies.
-  Investigate the role of colon cancer stem cells in disease progression, resistance to treatment and spread to other parts of the body (metastasis).
-  Determine novel tumour molecular signatures for prognosis and clinical use.
-  Understand how the immune system influences colon tumour development and progression to guide current clinical cancer vaccine trials in colorectal cancer.

CRW is proud to help support a multi-centre collaborative research project that aims to identify novel genes or gene patterns that predispose individuals to colon cancer and affect treatment response. This pioneering research has the potential to facilitate national screening programmes currently underway for colon cancer. To date, our scientists have discovered a gene termed EIF3H, which is shown to influence survival in colon cancer patients, irrespective of the type of treatment they receive.

Other related CRW funded projects are seeking to predict which colon cancer patients will respond to a new class of

drugs called molecular targeted therapies. The implication of such work is that colon cancer patients may receive treatment tailored to match an individual's own genetic makeup. This personalised approach will allow better patient targeting and spare certain patients inappropriate and unnecessary treatments.

Research groups in Bangor are looking at how cancer stem cells cause and promote the progression of colon cancer. Although these "embryonic-like" cell types make up a small percentage of the total tumour mass, they are thought to represent a critical cancer cell population that are essential for the metastatic process and other adverse features. Cancer stem cells tend to be resistant to chemo- and radiotherapy and have the ability to repopulate the original tumour following initial treatment, thereby, driving relapse.



Successful targeting of colon cancer stem cells offers the opportunity for complete eradication of residual disease and potential cure.

The balance of beneficial (effector T cells) and unfavourable (suppressor T cells) immune cells within colon tumours is one of the most powerful prognostic factors in colon cancer. Effector T cells promote the removal and degradation of "foreign" cancerous cells. We currently fund projects that are investigating the dynamic interplay that occurs between these two important T cell subtypes at various stages of the disease. The results from these studies have led to the development of clinical trials which seek to restore the correct immune balance in patients in order to improve the effectiveness of a cancer vaccine in colon cancer. This represents one of the first bench-to-bedside clinical trials involving solid tumours in Wales and we look forward to the results of this study in due course.