**Centre for Inflammation Research at The University of Edinburgh**

**Professor Moira Whyte**

Our ability to diagnosis disease and to develop new treatments is absolutely dependent on understanding how our bodies function in health and illness. As doctors we depend on the best research to enable us to improve patient care. I lead a team of internationally recognised scientists and clinicians at the University of Edinburgh's MRC Centre for Inflammation Research. We are focussed on the body's natural defence mechanisms, the immune system, and a process called inflammation. Inflammation is the body's protective response to injury or infection and it is how our bodies repair damage to our tissues. If it gets out of control it can damage healthy tissues and cause diseases such as asthma, arthritis and multiple sclerosis. Inflammation is a complex process that involves many cell types and different components of our immune systems. We investigate how different cells of the immune system interact to keep us healthy and how these interactions can go wrong to cause disease. We are also training the next generation of scientists to help us in our quest to tackle these complex challenges.

**Dr Donald Davidson**

My team is focussed on infectious diseases caused by viruses and bacteria. We are interested in how the cells in our bodies respond to infection and the molecules they produce at the earlier stages. In particular we are interested in molecules called antimicrobial peptides which can kill infectious agents and also tell other cells what to do. These defences are fairly non-specific and are known as innate responses. We are trying to understand exactly how these defences work as they can be very powerful for stopping an infection in its tracks.

**Professor Steve Anderton**

My team is investigating how the immune cells that normally protect us can malfunction and cause diseases. For example when the immune system overreacts and causes allergies, or when it loses control and attacks the body's own tissues, such as in multiple sclerosis and other autoimmune diseases. We are focussed on the cells that are involved in targeted responses that are learned by the immune system, known as adaptive responses. In particular we are looking at T cells and dendritic cells and how they interact with each other.

**Dr Yi Feng**

In my group we are interested in the various roles that the immune cells play in cancer progression. In particular we are interested in the point when a cell first becomes cancerous in our body. We are learning about how immune cells might support tumours or might choose to fight and destroy them. We work with zebrafish to study how the behaviours of different cells can be changed depending on the signals they receive. We are looking at innate immune responses of cells called macrophages and neutrophils which are part of the body's natural surveillance systems.

**Cathy Hawley PhD student**

I am currently a student training for a PhD in inflammation research. I work as part of a team looking at how innate immune cells called macrophages are produced and maintained in the body. These cells have many different roles. They help us to stay healthy, protect against harmful infections and also help to repair damaged tissues.

**Dr Kev Dhaliwal**

I am a lung doctor and also laboratory scientist. As well as treating patients I work as part of a large national team that is developing new tools and technologies to understand and see what is happening deep inside the human body. Our team is made up of doctors, biologists, chemists, physicists, engineers and mathematicians from Edinburgh and beyond. We are working on new technologies to visualise the cells and processes of the immune system, such as neutrophils and macrophages and bacteria, inside patients' bodies in real time so that we can see how they interact and function.

Our hope is that the knowledge gained from our research will help us to find better ways of diagnosing diseases. It could also lead to new treatments that alter the behaviour of cells during inflammation to boost defences for fighting infections or cancers to stop the immune system from damaging our own tissues and to help the body heal after illness. Ultimately we want our research to improve people's health and change lives.