Our ability to diagnose 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’re focused on the body’s natural defence mechanisms – the immune system – and a process called inflammation.

Inflammation is the body's protective response to injury and infection and it’s 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’re also training the next generation of scientists to help us in our quest to tackle these complex challenges.

My team is focused on infectious diseases caused by viruses and bacteria.

We’re interested in how the cells in our bodies respond to infection and the molecules they produce at the earliest stages.

In particular we’re 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’re trying to understand exactly how these defences work as they can be very powerful for stopping an infection in its tracks.

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’re focused on the cells that are involved in targeted responses that are learned by the immune system – known as adaptive responses.

In particular we’re looking at T cells and Dendritic Cells and how they interact with each other.

In my group we are interested in the various roles that immune cells play in cancer progression, in particular when 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 these behaviours of different cells can be changed depending on the signals they receive.

We are looking at the innate responses of cells called macrophages and neutrophils – which are part of the body’s natural surveillance systems.

I am currently a student training for a PhD in Inflammation Research.

I work as part of a team that is 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.

I am a lung doctor and also a 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’s happening deep inside the human body.

Our team is made up of doctors, biologists, chemists, physicists, engineers and mathematicians - from Edinburgh and beyond.

We’re working on new technologies that can 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.