

Brain Activity

The working of the human brain gives rise to thought, feeling and movement. It monitors our bodies and our surroundings to guide our future actions and behaviour.

Worldwide, scientists are working to better understand how the human brain works and how it may work differently in different people, and just why that might be. In IMAGEN we are trying to understand how much our genes or our upbringing influence the way our brain works, and how it may influence how people develop as they get older.

To see the brain working we use functional Magnetic Resonance Imaging (fMRI) – also known as brain imaging. In the beginning of the 1970s, the Nobel Laureates Paul Lauterbur and Peter Mansfield made pioneering contributions, which later led to the applications of magnetic resonance in medical imaging.

As part of the IMAGEN project you will have the opportunity to participate in an MRI scan. We use fMRI to measure the changes in blood flow to different parts of the brain as we ask you to do different things in the scanner. For example, we can ask you to watch pictures, hear words or push buttons when asked – and then we can produce a picture of your brain working.

How can we do that?

MRI makes use of a strong magnetic field. The strong magnet aligns the elements in our body along the magnetic field. A radio frequency pulse of the same kind as radio waves is applied to deflect the elements. Then the pulse is switched off and the elements relax back to their baseline state within the magnetic field. The elements respond by creating a radio signal which can be measured with an aerial. This signal is higher in active brain areas with a greater amount of oxygenated blood.

A word of caution - you are not exposed to x-rays but the scanner generates a very strong magnetic field - 60,000 times stronger than the earth's magnetic field. This strong magnet attracts all metal so you can only participate in an fMRI study if you do not have metal in or attached to your body (e.g. bolts, clips left after any surgery; cardiac pacemaker, and non-removable piercings).