Who are we?

The Medical Research Council (MRC) improves the health of people in the UK - and around the world - by supporting excellent science, and training the very best scientists. We are a non-departmental public body funded through the government’s science and research budget. We invest in research on behalf of the UK tax payer.

What do we do?

For over a hundred years, MRC-funded scientists have been making life-changing discoveries, including the structure of DNA, the lethal link between smoking and cancer and the development of a group of antibodies used in making some of the most successful drugs ever developed.

Today our scientists tackle some of the greatest problems facing humanity in the 21st century, from chronic disease to drug-resistant microorganisms.

Our mission is to:
- Encourage and support research to improve human health
- Produce skilled researchers
- Advance and disseminate knowledge and technology to improve the quality of life and economic competitiveness of the UK
- Promote dialogue with the public about medical research

How do we choose what to fund?

Scientists apply to the MRC for funding for their research and applications are reviewed by panels of independent experts and awarded based on the very best science.

What science do we fund and where?

Our work ranges from laboratory research, for example on genes and molecules, right through to research involving people, such as clinical trials and population studies. Our science is split into six broad areas: infections and immunity; molecular and cellular medicine; neurosciences and mental health; population and systems medicine; global health; and translational research.

Our research is carried out in universities, hospitals and in dedicated research establishments across the UK and Africa. Find out more at: mrc.io/cl-about
The MRC in numbers

In 2015/16 the MRC spent £927.8m on research

MRC research is linked to creation of 140 spin out companies bringing drugs, diagnostics, and treatments to patients

22 MRC-funded scientists have been awarded Nobel Prizes

Between 2006* and 2017 MRC researchers reported that 1,400 products or interventions were being developed as a result of their research

More than 100,000 scientific papers originated from MRC research between 2006* and 2017

9,985 research staff supported by MRC funding in 2016

MRC researchers collaborate with scientists in more than 130 countries

In 2016 the MRC supported 1,398 students

*Electronic records began in 2006
104 years of life-changing MRC discoveries

1984 • DNA fingerprinting is invented at the University of Leicester. The technique is now used for medicine, forensic science and paternity testing.

1960s • Clinical trials to test radiotherapy as a treatment for cancer are carried out. Today around four in ten cancer patients are treated with radiotherapy.

1953 • DNA structure is revealed to be a double helix by James Watson, Francis Crick, Maurice Wilkins and Rosalind Franklin, allowing us to understand how genetic material is stored and copied in living things.

1933 • Flu is proved to be caused by a virus, rather than a bacterium, by studying laboratory ferrets which had caught the illness.

1916 • Rickets, a deforming and painful childhood bone disease, is discovered to be caused by a lack of vitamin D.
1991 •
Giving pregnant women folic acid is shown to reduce major birth defects of the brain and spine, following a nine-year study. The NHS now advises women to take folic acid before conceiving and during the first 12 weeks of pregnancy.

2002 •
An NHS screening programme is launched to test hearing in newborn babies based on a technology which analyses noises that the ear makes in response to sounds. Detecting deafness at birth allows babies to be treated earlier and more effectively.

2015
The first patient is treated with stem cell therapy for the eye condition ‘wet’ age-related macular degeneration, potentially bringing us closer to safely restoring sight in people with the condition.

2016
The antibiotic colostin is banned as an additive to animal feed in China when a gene is discovered that allows bacteria to resist all but a handful of such ‘last resort’ antibiotics. Over-use of antibiotics encourages microbial resistance to develop; a looming threat for human health.

2017
A bowel cancer screening test for the over 65s, developed with MRC funding and subsequently used in the NHS, is shown to cut the risk of developing the disease by one third, saving thousands of lives. The test uses a tiny camera on a flexible tube to allow pre-cancerous polyps in the bowel to be found and removed.

Read about more about our scientists’ latest successes at: mrc.io/cl-successes

Did you know?
Virtual reality (VR) can help treat severe paranoia by allowing people to confront situations that they fear, according to MRC research. Patients who fully tested out their fears in VR were later much less distressed when in a real world situation.
Living longer after pancreatitis

Damian Mole is a liver and pancreas surgeon who also does research in the lab, supported by an MRC Senior Clinical Fellowship. He wants to find out why people who’ve had a serious condition called acute pancreatitis have a shortened lifespan, even after they seem to have fully recovered.

Acute pancreatitis is caused by drinking too much alcohol, gall stones or trauma. On average, it kills one in 20 people who get it.

Damian’s research found that people who’ve had the disease tend to die at least three years earlier than those who’ve had less severe pancreatitis, even after they appear to have completely recovered – and he wants to find out why.

Patients are now being asked to join a clinical trial to analyse their anatomy, physiology and genetics. Damian’s team will do this at the time of their pancreatitis, three months after, and then again two years later to see what parts of their organ systems or cell types have changed.

Damian explains: “If we can unpick the molecular processes behind all of this, we can develop new drugs for pancreatitis patients to prevent an early death.

People who’ve had acute pancreatitis are more likely to get other diseases such as diabetes, so we might also be able to screen for those at greatest risk and intervene before it happens. The potential savings to healthcare worldwide could run into billions of pounds.”

mrc.io/cl-mole

Did you know?
An Alzheimer’s drug has been shown by MRC scientists to kick-start the renewal of stem cells inside teeth, leading to natural tooth repair. The discovery might one day reduce the need for man-made fillings.
‘Indescribable pain’: John’s story

John Lawrie, 47, is a father of two who works in IT. He had an episode of acute pancreatitis in March 2016 and one year on it is still having a huge impact on his life.

At first he dismissed some pains he was having as indigestion, but then one evening he developed agonising pain in his abdomen that left him curled up in a ball, struggling to breathe. He was rushed to hospital but the pain relief he was given on admission “didn’t even take the edge off”.

Tests revealed that John had hepatitis – caused by gall stones – which had caused his pancreas to become inflamed, a condition known as acute pancreatitis. He met surgeon Damian Mole (see profile opposite) to discuss his options and ended up having surgery to remove his gall bladder to prevent any further inflammation. “The thought of surgery was scary but at that point I was in so much pain I was willing to try anything,” he says.

Recovery has been slow. The pancreatitis hasn’t gone away and John is still on regular pain relief medication and has been in and out of hospital. While struggling to recover he has also been diagnosed with diabetes, a consequence of damage to the pancreas.

“That level of pain I experienced - there’s nothing that comes close to it,” explains John. “Any research that helps to aid recovery from pancreatitis has to be a good thing. A year on, I’m still feeling the effects of that day.”
Old drugs, new treatments for dementia

Neurodegenerative diseases such as Alzheimer’s disease are incurable conditions that cause brain cells to die. They’re strongly linked with ageing. As the proportion of elderly people in the population rises these diseases are a growing problem for our society.

MRC scientists at the MRC Toxicology Unit in Leicester led by Professor Giovanna Mallucci have discovered a chain of events that happen inside mouse brain cells that cause the cells to die. They discovered that the accumulation of malformed proteins in the cells activates a natural defence mechanism, ‘switching off’ the vital production of new proteins in brain cells and leading to neurodegeneration.

Recently they found two drugs which block this pathway. In studies of mice with symptoms of neurodegenerative disease the drugs halted the death of brain cells, reduced brain shrinkage and restored memory.

One of the drugs, trazodone, is already on the market as an antidepressant, and the other is being trialled as an anti-cancer drug.

“We know that trazodone is safe to use in humans, so a clinical trial is now possible to test whether the protective effects of the drug we see on brain cells in mice with neurodegeneration also applies to people in the early stages of Alzheimer’s disease and other dementias,” explains Giovanna.

“We could know in two to three years whether this approach can slow down disease progression. And if you could prevent progression of disease that would already be an enormous step forward in preserving quality of life and preventing people from becoming institutionalised,” she adds.

mrc.io/cl-mallucci
A lifetime under the lens of medical research: Sheila’s story

Sheila is one of over 5,000 people born in one week in 1946 who have been studied by scientists for their whole lives.

Known as a ‘birth cohort study’, the MRC-funded National Survey of Health and Development is the longest-running study of its kind in the world. Its findings have influenced policy on, for example, the impact of a deprived background on whether a bright child will go on to university.

Sheila’s earliest memory of the study is when she was at primary school: “There were intelligence tests sent through which had to be done under supervision. I was summoned to the head teacher’s study and thought I’d done something wrong!”

Over seven decades, surveys and tests have arrived in the post which Sheila has dutifully filled out and returned. Nurses have visited her at home over the years to do all kinds of tests and measurements – from blood pressure to analysis of grip strength and sense of smell. More recently she’s had brain scans so that study members can be tracked over the coming years for dementia research. “I’ve said they can have my brain and my body when I die. My husband said ‘does that mean we don’t have to pay for a funeral?’”

Of all the contributions the study has made, Sheila feels most proud that evidence from it was used to underpin the government’s Sure Start programme to give children under the age of four the best start in life.

Reflecting on why she has continued to take part, she says: “If you can do something that might add to the sum total of mankind’s knowledge, then why not? It’s an easy enough matter.”

mrc.io/cl-nshd
Cancer of the oesophagus is a very aggressive disease; only 13% of those diagnosed with it survive for five years or more. That’s because usually by the time it’s diagnosed the cancer has reached an advanced, incurable stage.

At the MRC Cancer Unit at the University of Cambridge, Professor Rebecca Fitzgerald has developed a simple, low-cost test which allows the disease to be detected at a very early stage.

The Cytosponge Test consists of a small sponge inside a capsule attached to a string, which is swallowed along with some water. It expands inside the stomach into a mesh which is pulled back up the gullet, collecting cells from the lining of the oesophagus that can be analysed with a molecular test for cancer.

The test is now being used in 150 GP surgeries across the UK as part of a trial run by Cancer Research UK. The study will find out if the test can increase the number of diagnoses of Barrett’s Oesophagus; a condition which carries a high risk of developing oesophageal cancer.

The cytosponge costs just a fraction of the traditional endoscopy examination, is more comfortable for patients and can be used easily in the GP surgery. If it’s shown to be cost effective and well accepted by patients it will be adopted as a standard test on the NHS.

Rebecca explains: “A good reason to start screening now is that better treatments are available. Up until about ten years ago, all we could do is remove the entire oesophagus. But if you find early cancer now, you can remove abnormal areas using microsurgery or a technique called radio frequency ablation and avoid surgery.”

mrc.io/cytosponge
Skills and careers

Are you interested in research? A career in science can be exciting, challenging and fulfilling. Medical research can be especially rewarding as the knowledge gained with each new discovery could save lives or improve health.

We have created an online careers tool featuring people at different stages in their scientific careers to give you an idea of what career options are available in science.

Find out more about their careers by exploring our Interactive Career Framework:

mrc.io/cl-careersframework

Sara Wells

“Being a facility director or manager is the perfect job if you are interested in science but want a more structured role and don’t want to focus on just one area.”

Director of the Mary Lyon Centre, MRC Harwell

Dr Donald Davidson

“One of the things I love most about science is the opportunity to follow your nose. There are so many opportunities to develop your interests – you just have to grab them when they come up.”

MRC Senior Non-Clinical Fellow and Inflammation Biologist at the MRC Centre for Inflammation Research at the University of Edinburgh
Get involved

Come along to our MRC Festival of Medical Research held each June and learn more about the work we do. For more information visit: mrc.io/cl-mrcfestival

Help our scientists with their research by taking part in an MRC citizen science project: mrc.io/cl-citizenscience

Interested in taking part in medical research? Find out how: mrc.io/cl-involve

The MRC has an independent charity, based at our London head office. Learn more at: mrc.io/cl-mrf

To find out more about the MRC and keep up to date with the latest news visit:

- www.insight.mrc.ac.uk
- youtube.com/mrccomms
- twitter.com/The_MRC
- scoop.it/mrc-news
- facebook.com/mrccomms
- linkedin.com/company/medical-research-council

Subscribe to our free magazine, Network, by visiting: www.mrc.ac.uk/Network

Medical Research Council
Polaris House
North Star Avenue
Swindon
SN2 1FL

Medical Research Council
One Kemble Street
London
WC2B 4AN

Phone: 01793 416200
corporate@headoffice.mrc.ac.uk
www.mrc.ac.uk

Published May 2017 under creative commons licence, Attribution 2.0 Generic (CC BY 2.0)