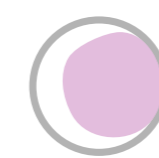
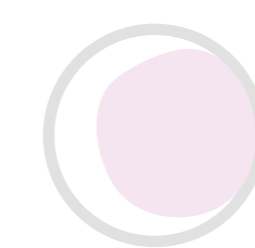
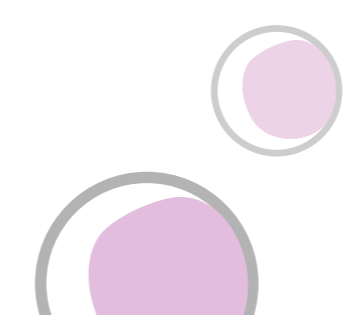


**STEM CELL
FOUNDATION**



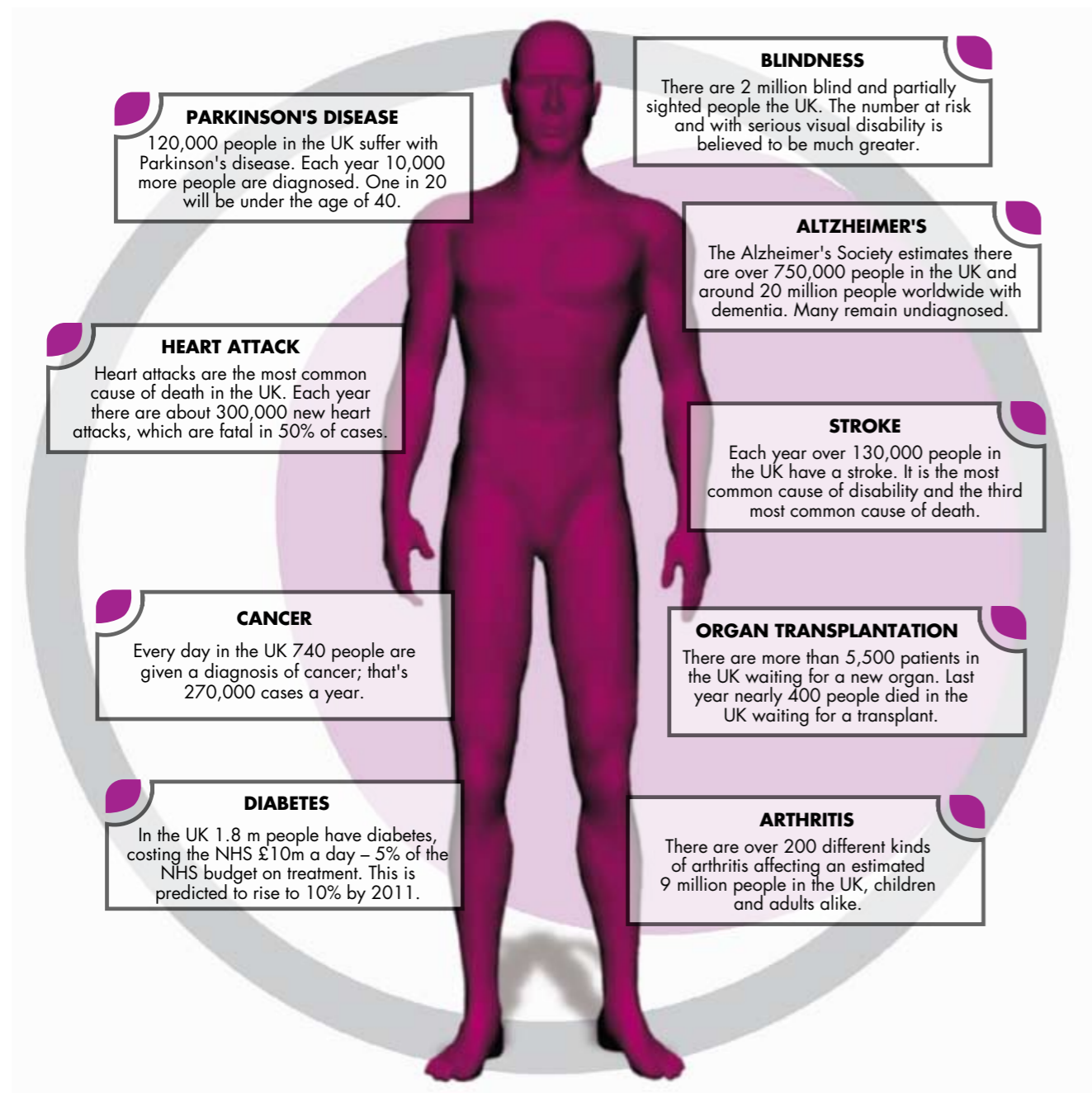
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Medicine's brightest hope



There have been three great ages of death: the age of disaster, the age of disease, and the age of decay. For 99% of our past, we perished of natural causes – of cold, of violence, of starvation. In that first, and longest, era of disaster, men and women were rare indeed. The average Briton now sees more people each day on their way to work than a typical hunter-gatherer would have seen in a lifetime. Infection could not get a hold in such scattered populations and we left this life in the way that most mammals die today.

Ten thousand years ago came farming, and the population exploded until, nowadays, we are ten thousand times more common than before. Abundance brought diseases – smallpox, cholera, the black death (all which came from our domestic animals). Epidemics swept through the world. Just two centuries ago, the average British baby had only a one in two chance of making it to the age of 21.



Now, just one in a hundred fails that survival challenge, for – in the west, at least – we have escaped the age of disease. Of course, we still all die in the end, but in a new way: of decay. Old age is almost unknown in nature, but most of us will, whether we like it or not, achieve that state. Age is inevitable, but for the first time, we are beginning to understand what lies behind it.

Stem cells are the essence of youth; with sperm and egg the youngest of all. They rejuvenate our tissues – so effectively that we gain a new liver every year (although the brain is almost as old as those who bear it). Although a huge amount remains to be learned about the biology of stem cells, many of the diseases of old age arise when such cells fail in their task.

Some say that because the science of stem cells is so new that it is too early to think about using them in treatment.

We disagree.

The age of disease came to an end not through science, but through expediency – John Snow* removed the handle of the Broad Street pump and Jenner vaccinated against smallpox without the smallest idea of quite why their technology worked, although it unquestionably did. The Stem Cell Foundation thinks that it is time for the same pragmatic approach; to approach the problem just as those medical pioneers did and to test, in the most direct way, whether stem cells can help the diseases of age. We do not promise an escape from the age of decay, but at least we might make the process of decline far less painful than it is today.

Steve Jones,
Professor of Genetics, University College London and UKSCF Trustee

* On August 31, 1854, London experienced a recurrent epidemic of cholera; John Snow, M.D. (1813–1858), a legendary figure in epidemiology, suspected water from the Broad Street pump as the source of disease. Snow advocated the unpopular theory that cholera was transmitted by water rather than through miasma (i.e., bad air). To test his theory, Snow reviewed death records of those who succumbed to cholera, documenting that most victims had lived near and had drunk water from the pump. Snow presented his findings to community leaders, and the pump handle was removed on September 8, 1854. Removal of the handle prevented additional cholera deaths, supporting Snow's theory that cholera was a waterborne, contagious disease. Despite the success of this investigation, the cause of cholera remained a matter of debate until *Vibrio cholerae* was isolated in 1883.

THE MOST PROMISING AREA OF MEDICINE

Stem cells are the 'building blocks' for every type of cell in the body, capable of maturing into any tissue type. Stem cell research promises to lead to innovative cell based therapies which many of the world's most eminent biomedical scientists feel are the most promising areas in the whole field of medicine – as significant an advance as vaccination and antibiotics.

If stem cells can regenerate or repair any damaged tissue they have the potential to tackle degenerative diseases; from Parkinson's to cancer, from diabetes to heart disease, to leukaemia and sight loss. The resulting prospect that we will live longer means that

we will also want to live well.

Parliament gave research the legal framework. It's time to deliver.

The UK is a recognised global leader in stem cell research. The

UK Government is supportive of this work and the legislative environment, which permits stem cell research with appropriate ethical and practical safeguards, has been exhaustively constructed. However the UK's position is under threat because of a critical funding gap that exists in this country and is currently filled more effectively elsewhere by private and Government funding.

Put simply:

- At present there are only palliative or maintenance treatments available for many diseases. For diseases like diabetes, retinal degeneration and Parkinson's, stem cell therapies offer a potential cure. The benefits of proven treatments would be huge;

- Current funding mechanisms appear to favour hypothesis-driven, intellectually based research at the expense of translational and clinical stem cell research. This poses a threat to the UK's ability to innovate as many of the techniques and applications needed to produce stem cell therapies could be developed elsewhere;
- Stem Cell technology is a new area where commercial applications are still uncertain. It is not therefore an attractive investment to venture capitalists or pharmaceutical companies – simply put, the risks are higher than in developing new versions of more conventional therapies;
- As a consequence, almost no funding exists to support the application of highly promising stem cell projects in patients.

We need your support to take scientific, ethical and commercial leadership of this vital area. The potential to benefit humankind is immense.

If we miss this opportunity:

- Our scientists may be attracted to countries where leading edge and translational research is better resourced;
- The rigour, care and humanity of the ethical and legal approach in the UK to date may cease to be seen as the global standard;
- The commercial benefits that emerge will be exploited elsewhere and the resulting technologies may need to be bought back, expensively, by the NHS.

With major contributions to the basic science, and legislation that reflects public opinion (unlike some other countries), the UK is a leader in stem cell research. Too often in the past, however, the UK has failed to make a proportionate contribution to practical applications and benefits that flow from the research. The Stem Cell Foundation aims to help avoid this happening again.



Stem Cell research is one of the greatest opportunities to reduce human suffering. Stem cells can, and will, cure diseases without any other hope. I'm thrilled to be involved. *Jon Moulton*

WHY THE UK STEM CELL FOUNDATION?

The UK Stem Cell Foundation has been created to ensure a speedy transfer from the laboratory bench to the bedside. It will do that by directly funding promising clinical projects in UK medical schools, universities and hospitals. This will be achieved by providing support to enable translational research studies and clinical trials to advance; and by promoting a collaborative dialogue amongst the stem cell research community.

The creation of the Foundation has been endorsed by the Royal Society of Medicine, Medical Research Council and Biotechnology and Biological Sciences Research Council, and by twenty leading research universities, including Oxford, Cambridge, UCL, Imperial, Edinburgh,

Newcastle, Bristol, Manchester and York. The trustees are all endowed with a 'can-do' attitude, and with an outstanding ability to select winning projects, develop and manage them to fruition.

DNA is chemistry, but stem cells are biology – and biology is a lot smarter than chemistry. Gene therapy is still not much more than a hope, even though we have learned an enormous amount about genes.



Stem Cell Research holds enormous potential in improving medical treatments for those suffering from debilitating chronic diseases such as Parkinson's, Alzheimer's, Diabetes and Cancer.
Sir Richard Sykes FRS, Chairman UKSCF

However, bone marrow transplants succeeded long before we really knew anything about stem cells and although we still have a lot to find out we already know enough to move forward fast. There is a lot more science to be done: but we believe that the proven power of the body to regenerate itself means that now is the time to bring stem cells into the clinic. Professor Steve Jones

The Foundation has attracted a powerful group of supporters and trustees;

Sir Richard Sykes is Chairman of The Royal Institution of Great Britain, formerly Chairman of GlaxoSmithKline and a past Rector of Imperial College London



Lady Archer, a specialist in solar power conversion and Chairman of Addenbrooke's NHS Trust, Cambridge



Jon Moulton, the leading private equity specialist and founder of Alchemy Partners and Better Capital.



Nick Ross, broadcaster and science advocate



Steve Jones, Professor of Genetics at UCL, award winning author and media science pundit



Trevor Jones, Deputy Chairman of Council and visiting professor at King's College, University of London and Former Director General ABPI



Lord Winston, Professor of Science and Society, Imperial College London, TV and Radio presenter and prize winning author



Professor Chris Mason, Chair of the Regenerative Medicine Bioprocessing Unit at UCL and co-founder of the London Regenerative Medicine Network.



FRESH HOPE FOR GENERATIONS TO COME

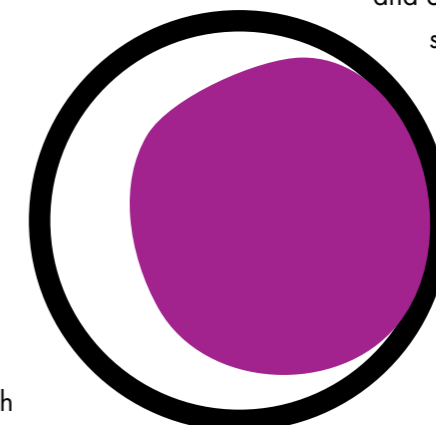
The fundamental reasons for creating the Foundation are:

- The desperate need of patients. A tour of any hospital or hospice brings the problem into immediate, personal focus. People are dying every day of diseases that research suggests could be treated or cured using stem cell therapies. The most important measure of our success will be whether there are people alive and with a higher quality of life, a decade from now who would have suffered or died without this research;
- Knowledge for the benefit of humanity. The Foundation is a registered UK charity whose mission is to support stem cell based projects that benefit patients directly and to disseminate that knowledge;
- Value-added to Health Services. Diseases such as Parkinson's which often require round-the-clock care for sufferers consume vast human and

economic resources. The potential savings to the NHS and other providers of health care when effective new therapies emerge from stem cell research run to billions of pounds;

- The urgency of competition. Although the US Federal Government has set limits on stem cell funding the state of California has recently voted into effect a \$3bn funding grant for stem cell research. Japan, Australia, Israel, South Korea and Singapore are also investing heavily and strategically. If the UK does not act now, just as with cloning technology, the mantra will be "invented in the UK – exploited elsewhere."

However, we will not oversell the benefits of investment in stem cell research. The prospects of rapid progress in this field are exciting but uncertain. In this area of science breakthroughs might be unexpectedly fast or frustratingly elusive.



WHERE WILL THE RESEARCH LEAD?

The Foundation's projects will be based on the use of adult stem cells taken, for example, from a patient's bone marrow, as has been the case with leukaemia for a long time. It is also likely that projects will emerge based on the use of embryonic stem cells. At this early stage of development stem cells are known as 'pluripotent' – they can develop into any form of clinically useful tissue. Embryonic stem cell therapies are some years off, but many scientists also believe that they offer the greatest long-term treatment potential.

Cell degeneration or malfunction is the cause of many serious diseases including Parkinson's, diabetes, blindness and heart disease. Cell trauma, such as spinal cord damage, or liver or kidney failure – following a stroke – has a similar impact. Unfortunately, most mature cells cannot regenerate themselves. Stem cell therapies replace dead or damaged cells with healthy cells of a similar type, or help healthy cells close to the site of the problem to repair the damaged tissue. The potential to heal degenerated or traumatised cells naturally is what makes the potential of stem cell technology so exciting and such a special case.

The UK Stem Cell Foundation is carefully structured with separate science and project committees to ensure scientific excellence, ethical care and patient benefit.

It may be a false dawn, it might be the biggest imaginable breakthrough in human health. Until we try we cannot know. Like life itself the journey is likely to be unpredictable, challenging and enriching.

Nick Ross



The Trust will work closely with existing stem cell academic and clinical networks across the UK;

Close consultation will take place with existing funders of research such as the Wellcome Trust, charities such as the Parkinson's Disease Society, Diabetes UK and the British Heart Foundation, and with legislators, researchers and doctors.

Only a concerted collaborative effort backed by new resources will bring progress.

WHAT ARE OUR GOALS?

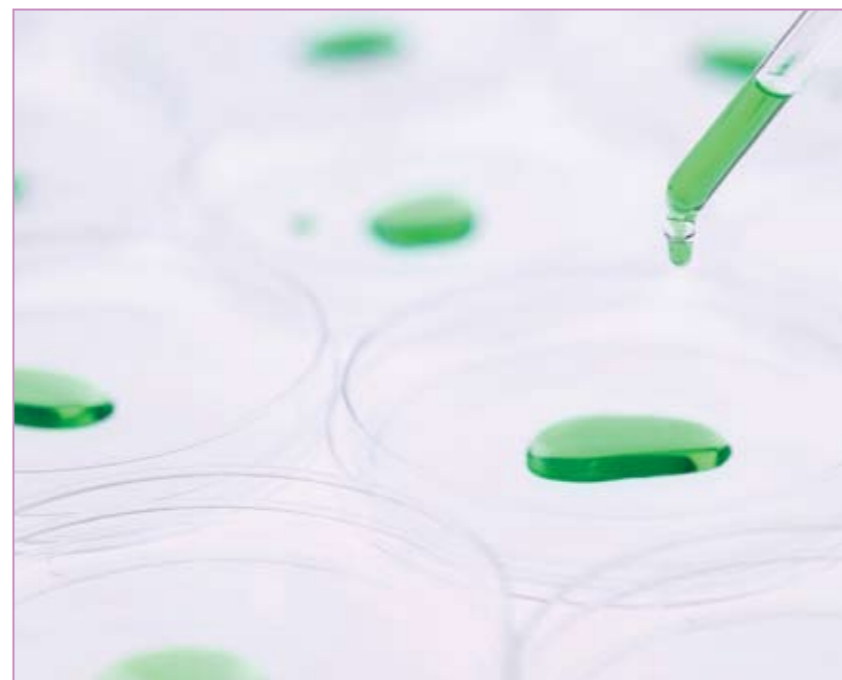
We have key projects ready to go – for instance introducing stem cells to repair the heart muscle of heart attack victims.

Funds to support the Foundation have been given by the Trustees, however we need to raise money to support projects now. Our aim is to generate a £100M funding endowment to fast track the translation of these pioneering techniques into practice in the years ahead.

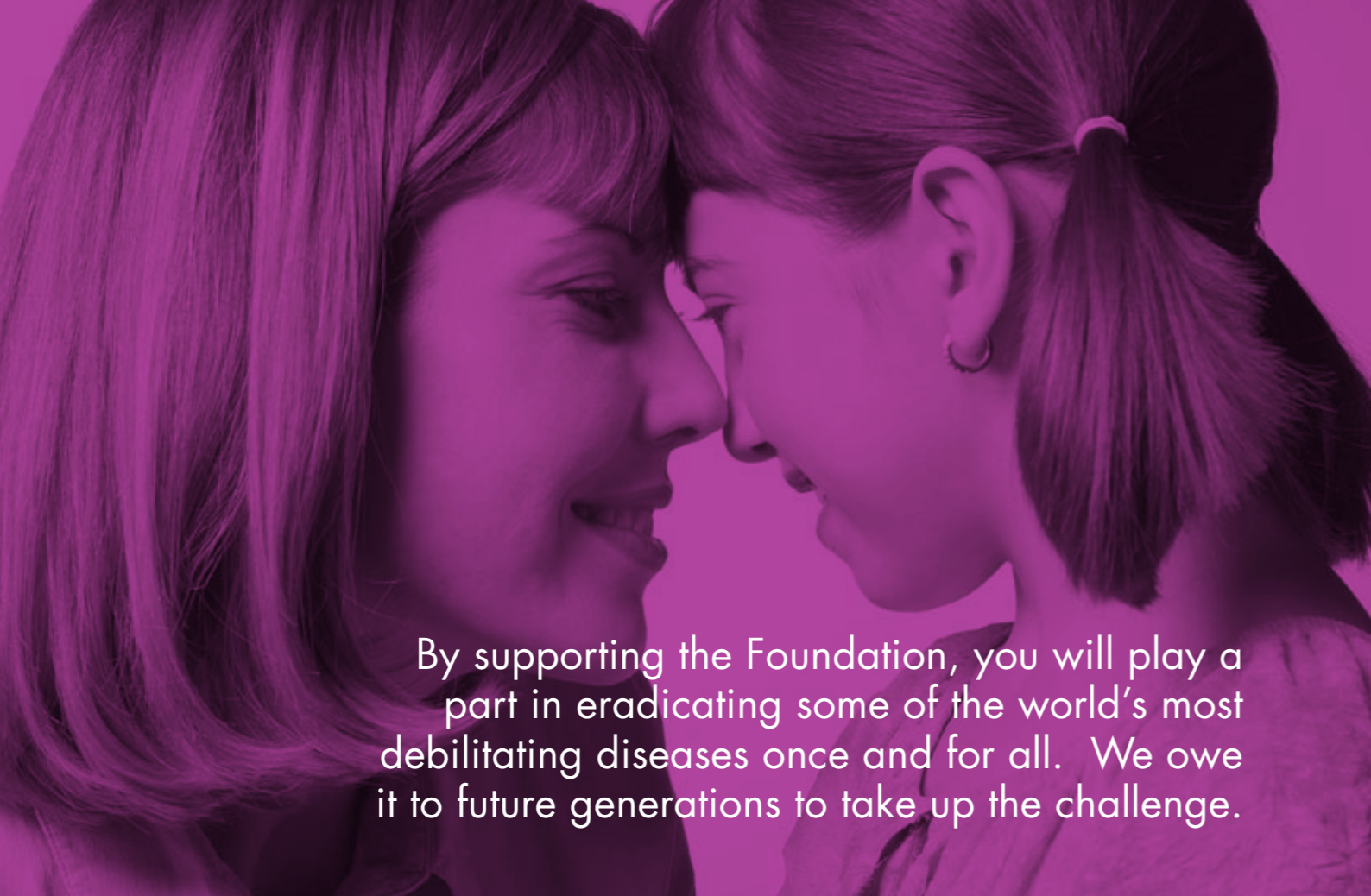
We recognise that there is always competition for research investment and we have no wish to detract from other priorities. We are arguing for new money because this, the most promising area of medicine, could provide powerful economic opportunities for the UK and for British science, yet falls into a gap between grant-funded long-term "blue-skies" projects and quick-return venture capital investments.

It is important to emphasise key differences between the Stem Cell Foundation and some existing funders:

- We will fund projects where research has indicated potential for direct clinical benefit to patients in the short-term to medium without in any way circumventing the important safeguards necessary to protect patients;
- We will support projects that the experience of many years tells us are likely to succeed. Without the constraints of some larger funders the trustees are able to exercise their formidable powers of judgement;
- The UK Stem Cell Foundation will have a lean, cost-effective administration and will benefit from the vast experience of its board and from careful, concise and intensive project management;
- We will seize opportunities to fund innovative projects when they arise. As a dynamic and flexible Foundation we can be nimble in our grant making and support. We are fiercely determined to maintain a non-bureaucratic approach;
- We will promote stem cell networks, dissemination of new ideas and knowledge, and the development of an ethical regulatory framework as medical advances occur. This new field of science needs guidance in areas such as the questions clinical trials should pose and answer; how a standardised product can be developed and delivered to clinicians; and how stem cells and patient data can be ethically recorded, stored and transmitted.



Stem cell science is the most exciting area of scientific research and development in the world right now.



By supporting the Foundation, you will play a part in eradicating some of the world's most debilitating diseases once and for all. We owe it to future generations to take up the challenge.

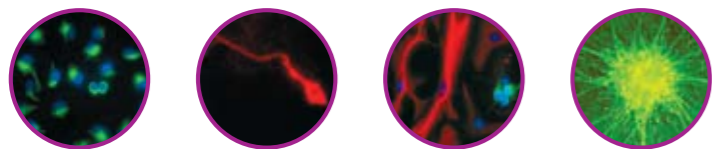
HOW CAN YOU HELP?

Your donation will allow us to undertake clinical development work, which has the prospect of near term patient benefit. The culture of the Foundation will be inclusive, personal and transparent. The funds we are seeking to raise are, by the nature of our work, substantial. As a supporter of the Foundation you will be kept closely involved with progress. Because stem cell research is in its infancy, we expect to share frustration and failure as well as success with our donors. For many supporters, this sense of discovery at the cutting edge of human science is the greatest incentive to become involved. For many others it will be the personal experience or tragedy of witnessing a degenerative condition that could be made a thing of medical history.

Specifically, all our donors will be offered:

- Bi-annual briefings by the leader of the team carrying out their project;
- Copies of all research papers, media coverage and other public documents associated with the project;
- An invitation to an annual top level stem cell lecture and dinner with Foundation trustees and leaders in the field;
- If desired, a named association with a project being funded – for example, some donors may wish to name the project in honour of a family member or friend.

We would be pleased to discuss other, personal forms of recognition with you.



IN SUMMARY

- Stem cells offer the greatest hope in any area of medicine to humanity's most devastating diseases;
- The Foundation exists for the public good and will carefully address all ethical and practical concerns about the nature of its research;
- Despite leading the world in early research breakthroughs, the UK is at risk of being overtaken, because it suffers from a key funding gap at the point of clinical application of stem cell therapies;
- The UK Stem Cell Foundation will fill this gap, selecting projects on the basis of its trustees' exceptional combined wisdom and experience;
- The ultimate success of the Foundation will be the achievement of new knowledge, direct economic benefit to the UK, and, most importantly, in lives saved and suffering prevented.



In the 20th Century medical research benefited from great chemical and biological discoveries such as aspirin, penicillin, elucidation of DNA and the human genome project. In the 21st Century we will witness the dawn of the era of true Regenerative Medicine only made possible by the fantastic breakthrough in stem cell research.

CONTACT

To find out more about supporting The UK Stem Cell Foundation, please contact:

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