A miracle cure? We're working on it

We lead the world in stem cell science yet fail to exploit it. That is changing, writes **Matthew Goodman**

TOM STOCKILL

ReNeuron's Olav Hellebo and Michael Hunt are pioneering stem cell therapy that could reverse the effects of strokes

In the ranks of human accomplishment, it has been likened to landing on the Moon. Last month Darek Fidyka, a Polish fireman who had been left paralysed from the waist down in a knife attack, was given the chance to walk again.

The procedure, carried out in Poland under the guidance of Geoff Raisman, a British scientist, was the culmination of 16 years of research funded in part by the UK Stem Cell Foundation.

It has rekindled hopes that stem cells could deliver a step change in medical care.

When the possibilities became clear in the 1990s, the use of stem cells — basic cells that have the potential to develop into different types — was seen as a breakthrough. British biotech firms were expected to seize the chance to develop a host of new treatments.

It has not turned out that way. "We are brilliant at the fundamental science," said the biotech investor Sir Chris Evans. "Some of the greatest stem cell breakthroughs are British. But we've never had the bravery or money to take these on."

Many of the companies at the forefront of developing treatments using stem cells are American, among them Mesoblast and Athersys. This is surprising given that US research was restricted after President George W Bush banned the collection of stem cells from unused embryos created for IVF treatment. Barack Obama reversed the decision.

"America is incredibly good at shifting [projects] from the laboratory to business," said Brendon Noble, a professor at the University of St Mark & St John in Plymouth and a trustee of the UK Stem Cell Foundation. "They value scientists who do that. In the UK, that hasn't been the case."

But there have been efforts to redress the balance. In 2012, cell therapy was one of seven fields identified by the government where Britain should be trying to establish leadership — others included satellite technology and renewable energy.

Keith Thompson, head of the Cell Therapy Catapult, said the aim of the centre is to "bridge the translational gap" where promising research fails to be converted into commercial endeavours. The unit, based at Guy's Hospital in London, has a £70m budget.

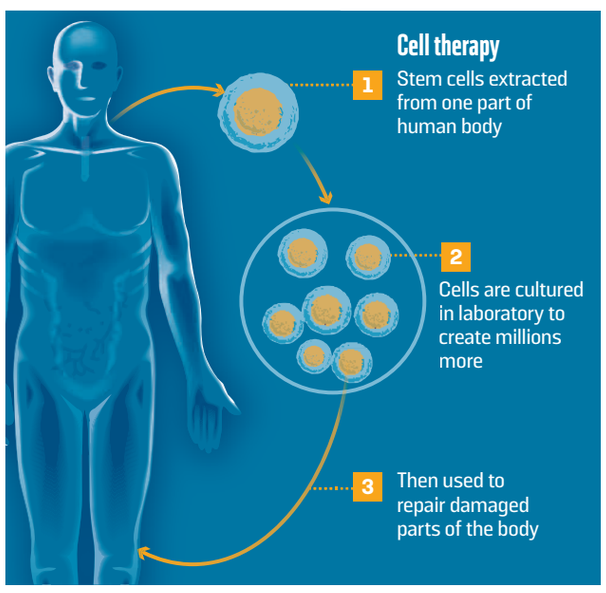
Only a few businesses have sprung up to develop and exploit stem cell technology. Here are five of the most prominent.

ReNeuron

This is, by some distance, the most advanced British stem cell therapy company, although it remains a way off having its treatments, for conditions including strokes, approved by regulators.

Evans, whose investment vehicles own about 15% of the business, points out that he first backed it in 1995. While other businesses he invested in around the same time, such as Vectura and Biovex, have stormed ahead, AIM-listed ReNeuron remains a work in progress. That said, he is very bullish about its prospects.

The Guildford-based business raised almost £35m last year — fresh equity and grant funding — and is recruiting up to 41 patients for its next round of clinical trials, examining whether its stem-cell therapy can reverse some of the effects of strokes. The first set of trials involved 11 patients.



The company is also working on treatments for other conditions, such as repairing damage to the retina.

Olav Hellebo, who joined ReNeuron as chief executive in September, is excited by the prospects but resigned to a wait. "Overnight success in our industry takes 10 or 15 years," he said. "We are getting there."

Azellon

A smaller, privately held company, Azellon has a very specific goal — using stem cell therapy to repair damaged knee cartilage.

Founded five years ago by Professor Anthony Hollander, Azellon is a spin-out from Bristol University. Its financial backers include IP Group, the quoted investment vehicle that helps commercialise university inventions, and Hugh Osmond, the restaurants entrepreneur.

Simply put, Azellon's technique works by extracting stem cells from a patient's bone marrow and combining them with a special membrane to form a "cell bandage", which can be implanted in the knee to help repair the damaged cartilage. The treatment could reduce the likelihood of developing conditions such as osteoarthritis, which can be caused by existing therapies.

Azellon has tested the technique on a small number of patients over the past 18 months and is expected to report the results in the near future. Hollander said he is keen to develop an enterprise that is "as good for the economy as it is clinically useful for patients and scientifically interesting".

Precious Cells

This is one of several commercial operations established to store umbilical cord blood stem cells for future use.

The private company, founded and run by Husein Salem, a 35-year-old scientist and entrepreneur, recently raised £2m to expand its activities, taking the total funding it has attracted to about £5m.

The company's charitable arm has set up a partnership with the NHS trust in Croydon to allow parents to donate cord blood stem cells to a public bank or store them privately for their own future use. Storing the cells (in special tanks using liquid nitrogen) is a kind of insurance policy; the hope is science will advance sufficiently so the stem cells become integral to future medical treatment. Precious Cells is believed to be talking to other health service trusts about similar partnerships.

Salem believes stem cell storage remains little known in Britain. He said his biggest sources of revenue are east European countries such as Romania, Bulgaria and Macedonia. The firm offers a scheme to store cells for up to 30 years although this can be extended.

Other players in this area include Virgin Health Bank, set up by Evans and Sir Richard Branson and based in Qatar.

Epistem

Another AIM-listed stem cell technology business, Manchester-based Epistem has expanded away from its roots working on stem cell therapies in an effort to develop a business more likely to deliver returns for investors.

It is gearing up for the launch in the new year of Genedrive, a hand-held device that will allow doctors to diagnose infectious diseases within an hour. Getting the machine to market will be "a mammoth step forward", said chief executive Matthew Walls.

But Epistem has not abandoned what Walls calls its "massive stem cell heritage". It continues to work with large drug companies, using its knowledge of stem cells to advise on the likely effects of new drugs when they are at their early, experimental stage.

The company, which floated in 2007 and is valued at just under £30m, counts blue-chip names such as Odey Asset Management, M&G and BlackRock among its investors. It was founded in 2000 by Professor Chris Potten and Cath Booth of the Paterson Institute for Cancer Research at Christie Hospital, Manchester. Potten was a pioneer in the study of stem cells in the intestine, skin, hair and breast.

Plasticell

Rather than developing its own treatments, Plasticell has pioneered a system that helps other drug developers to use stem cells. Founded in 2002, the company is headed by executive chairman Yen Choo and chief executive Dennis Saw.

The technique invented by Plasticell has improved the methods for turning stem cells into particular types of human cell, a key step in their use to treat disease.

The company believes it can carry out up to 10,000 stem cell experiments at the same time — a process that would have taken 200 years and cost a great deal more to complete sequentially.

Plasticell, based in Stevenage, Hertfordshire, has attracted what Choo calls "modest" amounts of capital, mainly from business angels.

It has spun off a separate business, Progenitor Therapeutics, also run by Choo and aimed at discovering and developing drugs that can regenerate specific tissues of the body.

Progenitor is financed by SR One, the venture capital arm of Glaxo Smith Kline, Britain's biggest drug company.