

# Scientist awarded Nobel Prize for developing IVF treatment

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Retired British professor Robert Edwards has been awarded the Nobel Prize for Physiology or Medicine in recognition of his pioneering work in the technique of in vitro fertilization (IVF). Edwards, a Cambridge university biologist, together with British gynaecologist Patrick Steptoe, carried out the ground-breaking research that now routinely allows human female eggs to be taken out of the body, fertilised by male sperm, and then implanted into the womb. It is estimated that this treatment of infertility has enabled more than 4 million babies to be born since it was first started in 1978 when Louise Brown became the first “test tube baby” born through IVF at Oldham and District General Hospital near Manchester.

The Nobel committee, based at the Karolinska Institute, Stockholm, said in its official statement that Edwards’s contributions “represent a milestone in the development of modern medicine”, and his vision that IVF would be possible, dating back to when he began his research in the 1950s, is now a “reality and brings joy to infertile people all over the world”.

Edwards, now aged 85, is too ill to travel to Sweden to receive the prize or to make use of the 10 million Swedish kronor (about \$1.5 million). Steptoe died in 1988, and Nobel prizes are not awarded posthumously. The delay of more than 30 years in honouring their research is above all due to the widespread opposition to this pioneering work by the world’s religious establishment and the corresponding reluctance by many governments to give wholehearted support to IVF treatment. The suggestion by some commentators that the Nobel committee had waited to see that Louise Brown was healthy and now has her own naturally conceived healthy child is hardly credible and has no scientific basis given the proven success of the technique.

A Vatican official, Ignazio Carrasco de Paula, president of the Pontifical Academy for Life, described the Nobel award as “completely misplaced”. It ignored the ethical implications of Edwards’s work, he said. “Without Edwards there would be no market for human eggs; without Edwards there would not be freezers full of embryos waiting to be

transferred to a uterus, or, more likely, used for research or left to die, abandoned and forgotten by all”.

To suggest that Edwards, who campaigned throughout his career for more help for childless couples, wanted to make money by marketing human eggs is a gross slander. The Catholic Church regards IVF as a sin, equating the accompanying destruction of unborn embryos—which occurs in nature all the time—with the killing of conscious human beings. It also regards birth that does not result from normal sexual relations as “unnatural”.

Robert Edwards came from a working class background and took advantage of the British government financing a university education for soldiers returning from the Second World War, something that was previously only available for the small number of children whose parents were wealthy enough to pay. He went to Bangor University in North Wales to study agriculture and zoology, then moved to Edinburgh University to study for a PhD in genetics. In the 1950s he became aware of work by other scientists who had fertilised rabbit eggs by adding sperm in a test tube, producing offspring. This was when he realised the potential for human reproduction and began studying how human eggs develop, which turned out to be different than for rabbits. He moved to a post in the physiology department at Cambridge University in 1963 and eventually succeeded in successfully fertilising a human egg in a test tube in 1969.

As the egg did not develop beyond a single cell division, Edwards hypothesised that eggs which had matured in the ovaries before they were removed would have more chance of survival. He learnt that Patrick Steptoe, in his work as a gynaecologist, had pioneered a technique called laparoscopy that allowed inspection of the ovaries to take place with an optical instrument. Steptoe agreed to use his technique to extract eggs from the cell culture, to which Edwards could add sperm. They succeeded in fertilising eggs in which several divisions took place. Edwards later recalled carrying eggs on the train from Oldham to Cambridge, using his own body to keep them warm.

The pair then attempted to obtain financial backing to

develop the research, applying to the UK's Medical Research Council (MRC) in 1971. Public funding for the work was rejected. A recent study of the MRC records shows a number of reasons why this happened. These included the "strong disapproval" by the MRC of the media discussion initiated by Edwards and Steptoe of their work and their challenge to ethical and religious opposition to infertility treatment. Also the MRC referred to government policy, which at that time was to reduce population growth, as well as regarding Edwards and Steptoe as not part of the "medical establishment": "Steptoe came from a minor northern hospital, while Edwards, though from Cambridge, was neither medically qualified nor yet a professor".

Edwards and Steptoe managed to fund their research with a private donation, and by 1978, when Lesley and John Brown came to their clinic after nine years of failed attempts to have a baby, carried out the first successful IVF treatment. Speaking in 2008 to celebrate 30 years of IVF, Edwards explained that Lesley had been hounded by the press when she was pregnant and that Patrick Steptoe had taken her into hiding, fearing she would lose the baby.

"The most important thing in life is having a child", Edwards commented on their joint work. "Nothing is more special than a child. Steptoe and I were deeply affected by the desperation felt by couples who so wanted to have children. We had a lot of critics but we fought like hell for our patients...".

Despite their success, Edwards and Steptoe were unable to get support from the UK National Health Service and established a privately funded centre for their work at Bourn Hall clinic near Cambridge. Steptoe was its medical director until his death, and Edwards the head of research until his retirement. It became a centre for the training of gynaecologists and cell biologists from throughout the world.

The publicity surrounding the early IVF successes led to increasing criticisms. For example, in 1984 an anti-abortion group attempted to take Edwards's research team to court, accusing them of being "instrumental in causing the death of a human being", for carrying out research on fertilised human embryos even though they were grown within the officially sanctioned time limit.

Human infertility research was one of the areas under attack from anti-technology campaigner Jeremy Rifkin, who accused scientists of pursuing their work without any questions being asked. He brought together unions, church groups and animal rights organisations to attempt to block "undesirable" scientific research. In fact Steptoe and Edwards had from the start criticised the Department of Health for not providing guidelines for IVF research, conscious of how "Frankenstein" scare stories could be

easily whipped up. Edwards responded to anti-science campaigns in a 1988 statement, saying, "There is a real danger that pressure groups are going to establish mob rule in the control of science".

Over the last three decades IVF techniques have undergone a number of developments and refinements. For example it is now possible to inject a single sperm into the centre of an egg in cases where the sperm count is very low.

It is now estimated that, thanks to these techniques, and in particular Edwards's contribution, between two and three percent of newborns in many developed countries are now conceived through IVF. However, even in developed countries many couples requiring IVF treatment are unable to receive it given the lack of government support. According to a recent survey, only in Australia and the Scandinavian countries does available treatment approximately satisfy demand, whereas in the United States, given federal reluctance to fund IVF, only 24 percent of demand for treatment is met.

No doubt Edwards will be pleased that the Nobel Prize award has drawn attention to his lifelong efforts and highlighted the religious bigotry and lack of government support for IVF that still persists. He is described by those who worked with him as a quiet and shy man who only sought publicity for his work and never for himself. He is quoted as having no interest in gaining a knighthood for his research, regarding himself as "a very left-wing socialist". He then jokingly added, "But if you can organise a Nobel, please go ahead".



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