



# Society, Religion and Technology Project

Looking at the ethics of technology for a New Millennium

[www.srtp.org.uk](http://www.srtp.org.uk)



Printed from the Society, Religion and Technology Project website: [www.srtp.org.uk](http://www.srtp.org.uk)

## Moral and Ethical Issues in Gene Therapy

 Published: Apr 14, 2010

### Introduction

Genetic research has advanced in a dramatic fashion in the last decade or so, to the point where it has now become possible to attempt therapeutic genetic modification, in a few cases of human genes, where a defect exists which manifests itself in certain serious diseases. This possibility, known as gene therapy, is only in its infancy. At present, no one knows how effective it will prove to be, even in the few conditions on which it is being tried - whether it will only be of relatively limited application, or whether it will open up many wider possibilities. It suffers both over-optimistic claims from some quarters and exaggerated dangers from others, over which the church needs to be discerning. It is, of course, not possible to assert exactly where the possibilities opened up by today's technology will lead in terms of future developments, but various ethical and moral issues are implicit in the technology which it is important to draw to the Church's attention, so that it is forearmed in an area where developments have been taking place at a bewildering pace. An editorial in the "New Scientist" in April 1994 drew attention to the need to weigh up what may still be future issues today, before the technological "horse" bolts from the stable and it is too late to lock the door.

#### Potential Ethical Issues

Perhaps the most basic underlying questions centre on a Christian understanding of the human being.

What does this tell us vis a vis our genetic and physical makeup?

What are therefore proper interventions into that genetic makeup?

What would be improper in terms of our human dignity?

More applied questions include :

The distinction between repairing genetic damage and any potential there might ever be to make genetic "improvements"

Our duties in respect to the rights and the suffering of future generations and to what extent we could intervene in the genome on their behalf

The dilemma that our human knowledge is insufficient, which means that risks are involved - how then do we handle the uncertainty?

The balance of individual and family or societal good, say regarding who has the right to know genetic information

How should a society best arrive at decisions and legislation over ethical issues, taking account of public opinion and minority views.

There are questions which relate to the proper place of the commercial dimension in medical technology :

the extent to which commercial interests are a catalyst for future developments or a pressure to drive it faster and further than is appropriate

the political choices involved in pursuing certain lines and not others

whether discoveries and applications of the the human genome and modified genetic sequences should be subject to intellectual property rights like patenting.

It lies beyond the scope of this brief report to develop a detailed theological and ethical framework to address such wide range of issues.

Since the focus is primarily on the issues themselves, the approach taken is to address the underlying ethical aspects in respect of particular issues as they arise.

### Is it acceptable for human beings to manipulate human genes?

Are we Playing God?

What is a Human Being?

Hubris and Humanity

[Back to Contents](#)

Are we Playing God?

It is often asked whether it is right for human beings to manipulate human genes at all, as if this were in some sense "playing God" by altering fundamental aspects of human makeup (and also that of plants and animals) which are God's prerogative only, or simply that it is a dangerous "tampering with nature" in a way which we have neither the right nor the skill to do? Christians have long viewed scientific

research as a proper response to God's commands to "fill the earth and subdue it" and to "work and take care of" the garden, illustrated in the touching and highly significant picture of Adam naming the animals. In relationship to God, humans are, as it were, invited to explore what he has created, in order to glorify him, to become better stewards of what he has made, to care better for our fellow humans and the other creatures we share the earth with, and to keep back the "thorns and thistles".

If science is therefore a proper human activity, reflecting in some small part God's own wisdom and creativity, and if technology is today its practical application, then it seems arbitrary to draw a line at the level of genetics, rather than, say, chemistry, nuclear physics or metallurgy, or at the level of gene therapy rather than pharmacology, radiation therapy or surgery. Some would go further and say that as a matter of very principle, technology can and must never be limited, as an expression of "the human spirit", or in more Christian terminology, as the expression of the openness of God's gift of human creativity. I would argue that Scripture, history and prudence all indicate the need to limit our creativity - that "can" does not imply "ought". Key concepts within which to frame a biblical view in this area are the nature of human being, and the constraints on what is permissible in the context of relationship.

### **What is a Human Being?**

In a biblical view, the human being is a complex unity, a whole entity more than the sum of such subdivisions as "body, mind and spirit". In Genesis, men and women are described in three illuminating ways. We are "dust" in the sense of being made of the same stuff as the rest of creation; today we might speak in molecular terms, but the meaning is the same. Yet we are more than dust - we have the breath of life. We are more than just living even, we are "in God's image", uniquely so in the whole creation. Putting it in more scientific terms, we are far more than the sum of our DNA complement.

Moreover, human beings can be described in terms relationship - first to God who is himself a Trinity of persons, then to ourselves in a true self-awareness in the light who we are in relationship to God, thence to other human beings, and to the rest of God's created order. Each of these relationships leads to moral precepts which sets bounds to what we may do within such a relationship, which may be applied to genetic technology. In scripture, the problems in which human beings find themselves are expressed in terms of disobedience to God, arising from a broken relationship with him. Failing to relate to God, and thus to our fellow humans, leads to distortions of human behaviour with false precepts, and also to attempting to set up alternative and substitute alliances with things which are non-relational - idolatry.

### **Hubris and Humanity**

In contemporary technological society, one manifestation is in notions of endless human evolution and improvement - the attitude that "the sky's the limit" to human endeavour, which finds an echo in the Old Testament story of the tower of Babel project. Some of the more extravagant claims for the potential of genetics see the human genome project as a further step along the road of human autonomy and mastery over nature. Another basic distortion is the tendency to evaluate all things in a material and economic frame of reference, seeing the potential of genetics primarily in terms of a means of economic gain and the power that goes with it, as though these were the supreme integration points for human activity, rather than seeing them within the wider framework of divine and human relationships.

Looking at genetic technologies in the context of acknowledging our relationship to God, limits the autonomy of this particular human activity, as of any other. Against a Christian concept of what it is to be human, it can be argued that we would not lose something of our humanity by manipulating genes as such, so much as in seeking to live outside a relationship with God, and perverting for purely selfish ends the relationships we share with fellow human beings and the rest of the created order. In this relationship, the human genome project can be seen as a continuation under God of our understanding of his creation, to be used to care for our fellow humans and glorify the Creator. There need to be constraints to keep back the excesses to which human beings are prone, and to keep genetics in a proper balance with the whole round of human activity and human need.

### **Risk and the need for humility and prudence in genetic developments**

Our understanding of human nature not only recognises our God-given abilities and possibilities, but also our limits and failings. Scientific enquiry at its best should bring a proper humility, which recognises both the wonder and also the smallness and contingency of the human condition in the created order. It recognises the limits to human knowledge and understanding. We are finite, and our knowledge of the universe is partial, imperfect and conditioned by the cognitive and social structures we have used in constructing our scientific understanding. It is a commonplace that new technological developments cannot see in advance all the pitfalls that will almost inevitably take place. There is always a risk involved. It is for human beings to weigh up the likelihood of what risks they can foresee, and to act or not act accordingly. But it is equally important to recognise that, especially in the early stages we will not be in a position to know what all the risks are until something has gone wrong. The effect of CFC's on the ozone layer is a recent case. We can take reasonable precautions, but there is no such thing as risk-free technology, and more than there is risk-free life.

Another cause for humility before any new technology is our frequent failure to see the wider connections with other parts of our life and the planet as a whole. The more complex and powerful the technology, like genetics engineering, the more important this is. Genetics is still a relatively young science, and its applications in gene therapy are at an even more rudimentary stage. This calls for prudence and the operation of the "precautionary principle", until we have reasonable evidence about possible side effects and also the long term effects on

the body as a whole. For example, gene therapy seeks to recover the main function of a defective gene, such as stimulating a vital protein, by manipulating or replacing it. But either the gene, or the mechanism used to introduce it into the body, may have secondary effects which need to be assessed and monitored over a due period of time.

In the late 1960's, leading geneticists showed a remarkable sense of responsibility and humility in organising a temporary, voluntary moratorium on certain aspects their research, while the certain risks and problems were assessed. As research has progressed subsequently, and some of the early fears did not seem to be realised, this restraint did not continue, but there remains among many geneticists a sense of caution, and concern for the wider implications of their work. There is an urgent need to develop this sense within the research community - where ethical acuteness does not often match the technical skills, and where constant pressures for recognition or promotion, the need to maintain funding, and simply becoming immersed in research for its own sake, can lead to unthinking science.

Of more concern, however, are the influence of commercial pressures from the biotechnology industry and sometimes from national governments, where the economic potential from genetics can be viewed with insufficient regard for other considerations. The desire of some, first in the USA, and then in the UK and elsewhere, to patent the mapped sections of the human genome is a telling example of the disruption which can result. A Christian understanding of human nature must take due account not only of human finitude but also of human fallenness. C.S.Lewis observed that "Man's power over Nature turns out to be a power exercised by some men over other men with Nature as its instrument." Genetics is no more immune from our perverse ability to turn whatever we discover to greedy, abusive and exploitative ends than any other technology.

[Back to Contents](#)

### **Is somatic gene therapy be ethically acceptable?**

In medical terms, it can be argued that to repair defective DNA so that the correct functioning of a gene is restored is a further extension of medicine, that has in the last 50 years taken us into hitherto unknown regions such as organ transplants, radiation therapy and in vitro fertilisation. As our knowledge of the human body and its functioning has increased, we can now envisage treating patients at a genetic level. In this sense, it would seem to raise no ethical problems if, instead of injecting a vital protein that is deficient in a patient, the gene which should be stimulating the body to produce that protein might have its normal function restored. Somatic gene therapy can be seen as a special case of medical treatment, in the sense of focussing familiar questions by the risks of a relatively unknown area of science, and the novel power and specificity of the level of intervention in the body.

In its report to the Government on the ethics of gene therapy, the Clothier Committe reported that although somatic gene therapy did not, in their view, represent a major departure from established medical practice, that familiar issues such as safety, unpredictable consequences and consent would assume greater importance because of the nature of genetic disorders. With the new degree of power and specificity of treating the body at the genetic level comes also a new degree of sensitivity to error and uncertainty in a relatively young science. There are some parallels in that sense with the development of nuclear physics from conventional physics, or lasers compared with ordinary light beams. Prudence indicates a proper caution, more than simply what would be required, say, for a new drug - in extensive and careful trials, the due consideration of side effects, in long term monitoring, and in counselling and consent procedures. Subject to such proper precautions, there would seem no more reason to object on ethical grounds to gene therapy than any existing therapy for a serious disease. On the contrary, as Christians we would strongly encourage efforts for the alleviation of the suffering of those with such diseases.

Of more concern is the generation of false optimism on the part of anyone involved - scientists, medical staff, health authorities, Government, and especially any commercial biotechnology firms who market the drugs, diagnostics kits or other supplies. It is important to resist the temptation to oversell one's scientific discovery or therapy or product, to avoid creating unrealistic expectations by the public in general, and especially vulnerable groups who might be anxious for any sort of remedy. It seems likely that it will be many years before more than very modest claims could be made of gene therapy, but naturally we hope and pray that its promise may be fulfilled in significant improvements for sufferers from cycstic fibrosis and other diseases.

[Back to Contents](#)

### **Would human germline gene therapy be ethically acceptable?**

Because somatic gene therapy is directed at the body's non-reproductive cells, it should only affect the genetic makeup of that one individual, and not be passed on to any children they may subsequently have. In contrast, any genetic changes in the reproductive cells - germline gene therapy - or changes made to the early embryo before the stage of differentiation into reproductive and non-reproductive cells, would affect all future offspring of that person. This makes an vital ethical distinction, affecting to major issues :

what is our duty in respect of future generations, their rights, choices, health, etc.?

could we ever know enough about the long term effects to judge that we could go ahead?

The Present Technical and Legal Situation

If somatic therapy is in its infancy, germline therapy is not even "a twinkle in the parent's eye". The technique is being used in higher animals in a number of applications, but in humans, it is not currently being seriously considered. Indeed, following the Clothier committee

report, it is illegal in the UK to do research in this area. Nonetheless, in the US, the National Institutes of Health wishes to raise public discussion on the issue, and a patent application for germline work on animals has included in its scope any potential human applications. In 1997, two discoveries may have brought the issue much closer than anyone thought, see our page [Is Germline Therapy a Step Closer?](#).

The Clothier committee reported “We share the view of others that there is at present insufficient knowledge to evaluate risks to future generations”. They recommended that germline therapy “should not yet be attempted” and this has now become law in Britain. This is a safe, pragmatic response, but it falls short of a proper ethical evaluation of the issue, since it focusses on our presently insufficient means to evaluate risk to future generations, and does not address the underlying issue of whether or not we have any right to decide for them. In practice it may not matter, since it is hard to see on what basis it could ever be decided that a scientific evaluation of the risk was now possible. Each application would presumably require a programme of full-blown human trials, necessarily extending over several generations, deciding for and perhaps putting at risk those very generations. Moreover, by definition, it would be difficult to identify which were generational effects that had resulted from the therapy.

### **The Lesser of Evils?**

It is far more likely that a justification to proceed with germline therapy would be proposed on the basis that such suffering was already involved, say from Huntington’s chorea, that whatever risk to future generations that there might be would be small by comparison. This would assume by default the right to decide for the future generations, and cite the justification to do so as probability of the lesser of evils. Some would justify this on the basis that we already make innumerable decisions which have a determinative and far reaching effect on our progeny, such as the way we bring them up, and the way we treat the physical environment which they will inherit. These are not proper analogies, however, since we cannot avoid having an effect on either our children or the environment, whatever we do or don’t do. Germline therapy is a conscious decision to cause a unchangeable physiological effect not only in all our children, but all their subsequent generations also, which would not otherwise occur.

The precautionary principle enshrined in the current UK legal prohibition of germline and early embryo gene therapy is certainly appropriate at our current state of genetic knowledge. As argued above, it is quite possible that there never could obtain such knowledge as would change this situation, or that the cost would make it impracticable. What is more difficult is the ethical question of whether we would ever have the right to make genetic decisions on behalf of future generations. Some would argue on principle that this violates individual rights unacceptably. Still others might argue that we have a duty to future generations to seek to eradicate genetic diseases wherever we reasonably can, but, as discussed above, this seems unrealistic in practice. It would seem hard and harsh to rule out absolutely any possibility of a specific future gene therapy that meant some extremely serious condition was not passed on to one’s children, but the seriousness of contemplating such an irrevocable step is daunting. The “lesser of two evils” approach exemplified above, for a very few extreme clearcut cases, and perhaps involving only dominant genetic disorders, would seem tenable for a Christian in theory. In practice, it would be extremely hard to know at what point we would be confident that we were justified in proceeding in their best interests, acting as they would have wished us to do, were they present to say so.

### **Would it ever be needed?**

Technically, the effectiveness of germline therapy would never be enough to rule out the need both post-fertilisation and foetal screening. An argument commonly made is that nothing would therefore be gained over the current procedure of testing the foetus, on the assumption that termination of the pregnancy would be performed. Similarly, preimplantation embryo gene therapy would involve more steps, more risks and less likelihood of a positive outcome than IVF followed by testing for “normal” embryos and implanting only these. This in its turn is much more expensive and failure prone than testing foetuses and abortion of “abnormal” foetuses, which is likely to be possible soon at very early stages of pregnancy.

In purely mechanistic terms, the logic has some force, but what is of some concern is that all of these arguments automatically assume that either termination of pregnancy or discarding of unused embryos under these circumstances is an ethically and medically acceptable and routine response. This is an unsound approach to take, as it omits and ignores any need to evaluate the moral and ethical dilemmas involved in either of these alternative methods, whatever one’s view of them. It also seems to imply that to have ethical reservations at this point is being seen by the medical profession as heterodox. It is not the intention to explore the issue of abortion at this point, but to highlight what would be a disturbing trend in how these issues are presented and evaluated. It is of vital importance that the moral reservations of many people are taken seriously.

Related to this is the question of whether germline or embryo gene therapy could gradually be used to eliminate a particular genetic defect like Huntington’s chorea from the population, i.e. negative eugenics. Even if human germline therapy ever became technically feasible, it is hard to imagine that it would be possible for more than a few rare cases, quite apart from the ethical considerations. The technical difficulties, risks and cost involved in applying it on the scale which would be needed to eliminate a given gene from a population would be simply prohibitive.

[Back to Contents](#)

## **Positive Eugenics - is it even an Issue?**

Much has been made in science fiction, notably in Aldous Huxley's "Brave New World" of 1932, of the idea of applying genetic engineering beyond the area of corrective or preventative medicine into changing human characteristics - the notion of "improving" the human being, and its political corollaries like engineering a "master race" and a "slave race". This has become a favourite topic for speculation and a source of catchy headlines in the media, but without any regard for the impracticability of the idea, thus perpetuating misconceptions and raising false alarms.

We have been considering thus far, the relatively small number of rare diseases which are accountable to a defect in a single gene. Although our understanding of the human genome may increase this number somewhat, it is important to make clear that the vast majority of both diseases and normal human characteristics - like height, physical endurance, artistic ability and intelligence - are highly complex "multi-factoral" phenomena. That is they involve the interactions of many different genes and any number of environmental influences and individual choices. Even supposedly simple things like the inheritance of hair and eye colour now seem to be more complex matters. Thus to talk of "improving the human race" by means of genetic engineering would seem to be as fantastic as most science fiction, quite apart from any ethical objections. Unfortunately, eugenic experimentation under the Nazi regime in Germany, has not only cast a shadow over the whole field of genetics, rather as Hiroshima has for nuclear power, but it has demonstrated what as Christians we would suspect from human sinfulness and perversity - that we could never discount the political possibility of genetic abuse if ever the technology were feasible.

## **The Illusion of Improving Human Beings**

Although eugenics of this type is more of the stuff of science fiction than any likely reality, a question to be raised is at what point would we pass from a genuine somatic gene therapy into cosmetic improvement? An ethical limit has been suggested by the analogy of the distinction between feeding growth hormone (which is not a gene therapy) to a child who is abnormally short, compared with feeding it to another child of normal height in order to get them into a basketball team. (ref. D.Suzuki, in "Designer Childen", transcript of episode 5 of the BBC television series "Cracking the Code", 5 October 1993).

A more fundamental question is what sense could we conceive of improving human beings? Logically is it a contradiction in terms to speak of improve ourselves? What constitutes an improvement, how would we recognise it as such, and who would decide it and control it? Christian teaching has several vital insights on these questions. There is something profoundly noble about man but also something profoundly lost, ignoble, perverse. However many medical advances we make, however much genetic engineering we might imagine doing, that intrinsic faultline is still there. The biblical testimony is that we are not evolving better and better, and the evidence of history would seem to agree. The dream of true improvement is an illusion while, as Jesus declared, it is what is in our hearts which defiles us. Moreover, even the best repair is only temporary. The writer of Psalm 90 observes that even living 10 years more than average is no great improvement, "and our years come to an end like a sigh". There is deliverance "from this body of death", but it requires "a new heavens and a new earth", the resurrection of the dead, not merely progressive improvements.

## **A Different Vision of Perfection**

Our ideas of what we mean by improvement are transient, as for example different cultures' conceptions in history of the "ideal" shape for a woman! There is perhaps a danger of the Greek concept of ideal forms, which has no part in a Christian view. The "proper man" of Luther's hymn, or Newman's "second Adam to the fight", is the man of sorrows, the shepherd king coming humbly, who though in the form of God became as a servant. Most paradoxically, the writer to the Hebrews observes "It was fitting that God, for whom and through everything exists, should make the author of their salvation perfect through suffering" (Hebrews 2:10). To emulate Him is our calling, man and woman alike. Paul's ambition "that Christ may be formed in me" is something very different from changing our genetics, where we remain uniquely ourselves, and yet Christ-like. Instead of the uniformity of the ideal, a narrowing of options of our gene pool, there is a rejoicing in diversity, and an expanding of possibilities in Christ.

## **The limits which society may place on genetic technology**

Public Perceptions

Regulation and Commercial Pressure

Public Attitudes and the Role of the Church

[Back to Contents](#)

Public Perceptions

In addition to technical, resource and ethical constraints, there are also limits which society as a whole may place on the development of a technology. Ethical concerns may well be an important factor in this, but a society's attitude to a developing technology is an amalgam of many effects which lie beyond ethics as such. These include the particular fears (or hopes) prevalent in the society at a given point in time;



the way the issues are being presented by Government, industry and especially the media; the level of trust society has in the decision makers; whether the public feel involved or excluded in the decision making; and so on.

An example of this is the fact that ordinary people may well perceive gene therapy as different from other medical interventions, whatever the experts or ethical committees may say. The intuition that it feels more risky to be playing about with the stuff we're made of at its most fundamental biological level is a real perception, which should not be discounted on the grounds of ignorance on the part of the lay public. If a significant slice of a society holds that perception, then that has to be taken into account in how that society assesses and regulates the technology. This is a "societal" limit to technology - what a society is prepared to accept being offered to it. It may not necessarily agree with what the experts, the Government or the industry say is "safe" or "ethical" or "acceptable". Moreover, painful experience shows that it is not just a matter of scientists "educating" the people. There is often a gulf of trust and communication as well as in understanding.

### **Regulation and Commercial Pressure**

Currently, the possibilities opened up by genetics are highly regulated in most western countries. In the UK, genetic research and its applications in gene therapy are strictly controlled by such bodies as the national Gene Therapy Advisory Committee and regional and local ethical committees for hospitals, universities and research institutes. These carry a heavy responsibility in an area where new developments are occurring all the time. This is a proper response to the concerns expressed above. It is important that, while not overdoing the regulatory hurdles that need to be cleared by applicants, these committees do not lose their ethical cutting edge amid the many pressures placed on them, both within and outwith. There may be a role for stimulating public knowledge of their activities, and thus increasing their accountability to society.

There is likely to be increasing pressure from commercial interests to reduce regulation to improve the economic prospects of their investments. There is both a proper and improper aspect of this. Much of the research into human genetics, and especially its transfer into effective therapy, depends there being a commercial benefit from developing and marketing a medical product. In the USA, booming predictions for new biotechnology companies have quickly foundered in numerous liquidations, and it is predicted that the market will support relatively few, larger companies. Testing and clinical trials can be vastly expensive, so there has to be a level of net investment return to make new genetic developments economically worthwhile. Set against this are market pressures simply to maximise profitability, especially in the short term, without proper regard for the many other aspects of a company's responsibility in society. In the field of human genetics, it is of the utmost importance that our society requires that private organisations bear these wider public responsibilities to the full.

It is also important to recognise that there are limits to society's ability to control a technology. No matter how well regulations are drafted, and ethical committees vet and inspect research and healthcare institutions, human goodwill is still a prerequisite for ethical behaviour in any field of technology. Biotechnology generally works on a small scale, which makes it easier to hide illegal, improper or inhuman practices, whether within big corporations, private institutes and clinics, or simply by individual unethical scientists working in secret. However, the scale of clandestine applications could only be limited, without public disclosure and resulting outcry. Of more concern would be where such practices were sanctioned by a national Government with looser ethical standards or malicious intent, and were then traded internationally. It would be naive to suppose that genetic abuse will not occur again.

At present UK law on genetic engineering is by and large informed by predominantly ethical stances which the Church would commend. A danger is that pressure is brought to bear to force this or any other biotechnological issue, in advance of thorough and proper knowledge, from vested interests - whether commercial, political or even scientific. Experience of other issues suggests that, even though scientifically the position had not markedly changed, after a few years it can be relatively easy to argue a case simply from familiarity with an issue, feeding off the notion that somehow we were holding up "scientific progress" (or economic growth, or even healthcare cost-benefit) by not allowing the technology to proceed. Arguments such as "if we don't someone else will, and we shall have lost an opportunity" need strong ethical courage to resist. It is in such matters where the influence of ideology or economics referred to in the introduction to this section can undermine ethics. There needs to be a public accountability of ethical committees, and open debate of these issues before changes are made to legislation or to the agreed standards against which committees vet applications. The Church needs to continue to make its voice heard in relation to these issues, and we should also pray regularly for those on ethical committees who make decisions on difficult issues under considerable pressures.

### **Public Attitudes and the Role of the Church**

At present, the mood in society is fairly positive towards gene therapy, at its current, limited and largely experimental level, provided strict safeguards are kept and its effects are carefully monitored. This contrasts with generally negative attitudes to eugenics, and ambivalence about other potential human applications of genetics such as transplanting genetically modified pig hearts and lungs to help make up the serious shortage of suitable human donor organs, or foodstuffs which involve a genetic modification stage. It is hazardous to predict how such attitudes might change, either with time, or if more general applications of gene therapy are envisaged. Sometimes a new generation wonders what its parents were so worried about, concerning a technology which has since become routine (e.g. the unheard of speed of train travel). Sometimes it will marvel at their failure to anticipate and address the many problems the technology turned out to have (e.g.

thalidomide).

Potentially, the Church has a special and independent role to play in forming society's attitudes to genetic engineering. As Christians we can take a wider perspective on the issues than either the advocates or detractors of genetic technologies. We are able both to expose pretentious claims and unethical initiatives, and to challenge ill-founded fears and specious objections. Through its normal teaching, the Church of Scotland can act as an informed and perceptive educator to a significant slice of the population. Through its reports, working groups and bodies such as the SRT Project, it can also act as a catalyst for balanced debate and decision making in official circles. Finally, each individual member can play a role in discussing these issues from the point of view of the love of God and of our neighbour.

Printed from [www.srtp.org.uk](http://www.srtp.org.uk) on Mon, April 13, 2015

© The Church of Scotland 2015

The Church of Scotland © 1995-2015 | 121 George Street, Edinburgh, EH2 4YN, UK | t: +44 (0)131 225 5722  
Scottish Charity Number SC011353 | [Privacy Policy](#) | [Copyright Permissions](#) | [Contact Us](#)