

# Beginner's guide to gene patents

Special report: the ethics of genetics

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## About this article

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### What is a patent?

A patent is a kind of licence granted by a government to an inventor. It gives the inventor the right, through the courts, to stop rivals from making, using or selling an invention without his or her permission. When a patent is granted, the invention becomes the property of the inventor. However the patent can be bought, sold, rented or hired.

### How long does a patent last?

Normally 20 years. After that, anyone can use the invention without restrictions.

### Who issues patents?

In Britain, the UK Patent Office. But Britain is a signatory to the European Patent Convention, so inventions patented in one of 19 other European countries can have patent protection here too through the European Patent Office. Under the Trade-Related Intellectual Property Rights (TRIPS) agreement, which came into force in 1995, almost the entire world is supposed to have acquired similar patent rules.

### What are the criteria for granting a patent to an inventor?

An invention must be novel - no-one else can have made it public; innovative - it can't be a development which would be obvious to specialists in the relevant field; and useful - it has to aid a practical human activity. It cannot be simply a discovery.

### But surely genes are pure discoveries?

So opponents of gene patenting argue. They also point out that with modern automated gene analysis techniques, the non-obviousness of genes is becoming doubtful. Supporters of gene patenting say gene function is not obvious and that genes are not mere discoveries because the genes are patented together with inventive descriptions of how they can be used for diagnosis or therapy.

### So what living things can be patented?

Naturally-occurring life forms, from plankton to people, cannot. But genetically engineered plants and animals, such as GM maize or lab mice designed to be prone to cancer, can. So can the naturally-occurring chemical codes and substances which allow all plants and animals, including humans, to function on a cellular level - like genes, or hormones - as long as the 'inventor' can specify a use for them.

### **Why should anyone want to patent something which occurs in nature?**

Holding a patent on a human, plant or animal gene gives the holder control over commercial exploitation of that gene. If it's a human gene, that may involve diagnosis or therapy for a disease; if plant or animal, it may also involve disease, the promotion of a desirable characteristic like a sweet taste, or the transfer of the gene from one organism to another.

### **If someone has patented something which occurs naturally in my body, do I have to pay them?**

No. Confusingly, a naturally-occurring gene can be patented as an isolated sequence, but not a gene in its natural state.

### **Can someone use a patent to block research?**

Yes and no. One of the claimed advantages of the patent system is that it obliges the inventor to publish details of his or her invention, allowing academic scientists to study it. But as soon as a researcher tries to make commercial use of developments based on the original patent - by going into partnership with a drugs firm, for instance, or charging patients at cost for a genetic test - the patent holder can step in to stop them, or oblige them to pay a licence fee.

### **How important are patents for innovative companies?**

Traditionally very important, as inventor James Dyson's recent victory over Hoover in the bagless vacuum cleaner wars showed. Many biotech companies, big and small, argue that genes must be patentable to allow firms to recoup their investment in identifying them. But other firms fear allowing genes to be patented before any specific, proven use has been established for them will hold back medical advances.

### **Can governments override patents?**

Yes, if they feel it is vital for the public good, and the patent holder is being too restrictive.

### **What would be the impact on the economy if gene patenting was banned?**

Unknown. The majority within the biotech lobby argues that it would discourage investment in genetic research. Yet the cost of identifying the function of a gene is a fraction of the cost of turning that gene into something useful, like a drug. There is an argument that the pharmaceutical industry, which has to come up with the bulk of the money anyway, would do better if firms were able to work freely with any genes and focused on patenting drugs instead. However, gene patent ownership is so important a part of biotech companies' stock market valuation that to threaten the concept would cause a market upheaval.

### **Useful links:**

[Genewatch UK](#)

[BioIndustry Association](#)