GENE THERAPY

Near curative capabilities - and more - on offer

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Multiple companies are delving into gene therapy research with hopes of developing a one-time treatment for genetic diseases. Research is still in the early stages and, over the past year, several clinical studies have been halted or scrapped due to safety concerns.

Hundreds of millions of research dollars are nevertheless being invested in gene therapies because of the potential near-curative capabilities the technology could offer. In December, life sciences giant Bayer launched a cell and gene therapy platform within its pharmaceutical division in order to become a leading global company. Eli Lilly also jumped in, acquiring Prevail Therapeutics in December 2020. In January 2021, German scientists reported they were able to use gene therapy to help paralyzed mice run again. Scientists in China announced the development of a gene therapy that could potentially reverse the effects of ageing.

Harvard University and the Massachusetts Institute of Technology are leading partners in a new public-private partnership to open a new facility to boost advances in cell and gene therapies. Part of the goal of the institute will be to boost the supply of materials for research and early clinical studies, provide space for some research and also offer training in equipment used for gene therapies.

Writing in Nature in 2020, Zhang Feng, Professor in Neuroscience at the McGovern Institute for Brain Research and at the Massachusetts Institute of Technology wrote that "to fulfil the potential of gene therapy and ensure that all patients have access to this revolutionary treatment, scientists will need to continue developing delivery approaches that are practical and widely usable, to refine molecular technologies for gene editing, to push our understanding of gene function in health and disease forward, and to engage with all members of society to openly discuss the risks and benefits of gene therapy."

Post Brexit, the UK has more freedom to apply the technology and in January 2021, Defra launched a 10 week consultation on how gene editing could 'help farmers with crops resistant to pests, disease or extreme weather and to produce healthier, more nutritious food'.

CLEAN MEAT

Ethical, healthy and environmentally friendly

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Canadian researchers have developed a new form of cultured meat that promises more natural flavour and texture than other alternatives to meat from animals. Published in the journal Cells Tissues Organs, the method used by researchers at McMaster University in Canada is based on stacking very thin layers of muscle and fat cells grown in the lab to form "slabs of meat." The researchers say they can replicate the marbling and fat content of any piece of meat with this new technique. The method can be adapted to beef, pork, or chicken, and is suitable for large-scale production.

Cultured - or clean - meat allows consumers to maintain their dietary preferences for animal meat while removing any moral, health and environmental considerations that may be associated with current production.

There are still technical issues to resolve before production at scale is guaranteed - but the global clean meat market is still expected to be worth around $600 million by 2032. Key players include Memphis Meats (US), MosaMeat (Netherlands), Integriculture (Japan), Aleph Farms Ltd (Israel), Finless Foods Inc. (US), Avant Meats Company Limited (China), and Shiok Meats (Singapore).

In December 2020, US start up Eat Just's cultured chicken was approved for sale as an ingredient in chicken nuggets in Singapore restaurants in a world regulatory first.

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