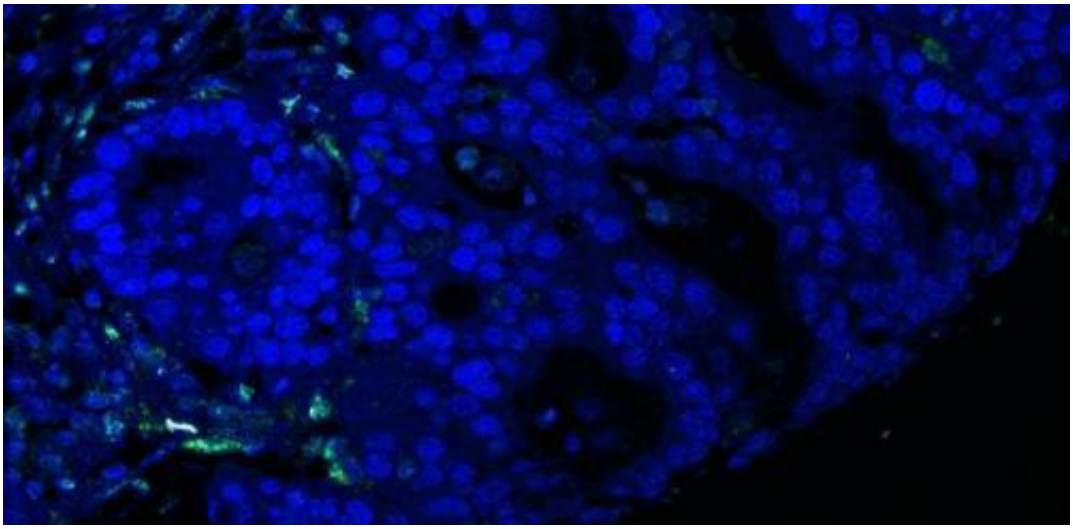
First of new generation of cancer drugs granted European approval

December 18 2014



Credit: Cancer Research UK

A new drug for ovarian cancer, developed by researchers at the University of Cambridge and AstraZeneca, has today become the first of new class of drugs, known as PARP-inhibitors, to be granted approval anywhere in the world. The drug, Lynparza, has been granted Marketing Authorisation from the European Commission.

The research that led to the development of the drug began in the mid-1990s in the lab of Professor Steve Jackson at the Wellcome Trust/Cancer Research UK Gurdon Institute at the University of Cambridge. It led to the launch of a university spinout company,

KuDOS, which was acquired by pharmaceutical giant AstraZeneca in early 2006.

"This is a success story both for basic science and for UK scientific innovation," says Professor Jackson. "The initial development of Lynparza would not have been possible without the freedom to pursue our own ideas, driven by our own curiosity, supported by charitable funding. Through our links to industry, this research has led to a considerable commercial opportunity for a UK-based company and a drug that will extend and enhance the lives of various cancer sufferers.

"Lynparza is an innovative new anti-cancer medicine that works in a different way to previously-marketed drugs. Unlike traditional anti-cancer drugs, it makes the cancer cells – not the normal cells of the patient – sick. Today's development should pave the way for further therapies based on this approach."

The drug works by exploiting inherent weaknesses in the mechanism by which DNA is repaired in certain cancer cells, allowing Lynparza to kill cancer cells but not the patient's healthy cells. Consequently, the drug has fewer side effects than traditional cancer treatments such as radiotherapy or chemotherapies.

Lynparza inhibits the action of an important protein enzyme in human cells called PARP. This enzyme is usually involved in helping cells repair damage to DNA, a crucial process that cells must do to remain alive. Most cells have a back-up repair mechanism known as homologous recombination, which kicks in when PARP is inhibited. However, some cancer cells lack the necessary proteins to carry out this back-up pathway; when PARP is inhibited in such cancer cells, the cancer cells die.

While there are other cancers that can potentially be treated by

Lynparza, the drug has initially been approved to treat ovarian cancer patients who have underlying, inherited mutations in the BRCA1 or BRCA2 genes – mutations that prevent homologous recombination. The normal cells in these patients have one 'bad' copy of the BRCA1 and BRCA2 genes, but still have one normal copy, meaning that they can still do homologous recombination – and hence are still able to carry out vital DNA repair. However, the cancer cells in these patients have lost the normal copy of BRCA1 or BRCA2; they are hence unable to carry out homologous recombination and so Lynparza kills the cancer cells, but not the healthy normal cells.

Clinical trials showed that the new drug, which has relatively mild side-effects compared to traditional anti-cancer agents, extends the progression-free survival of patients compared to those on a control treatment. The median progression-free survival was 11.2 months with Lynparza vs 4.3 months with placebo. There was also evidence for extension of overall patient survival.

Provided by University of Cambridge