

Protein KO stops tumour growth

April 19 2011, By Jonathan Wood

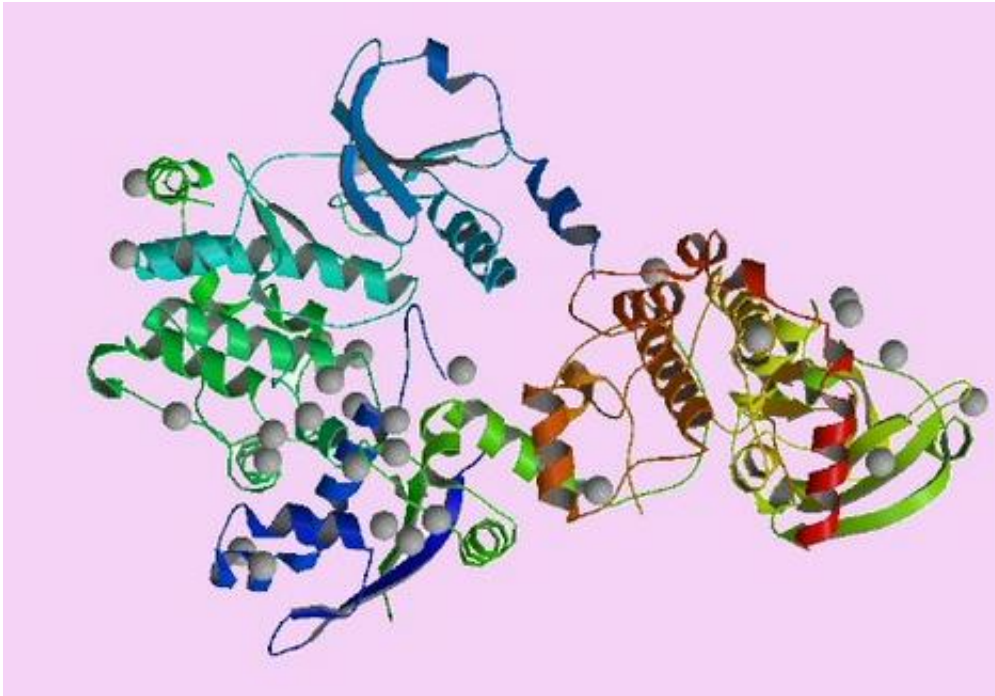


Illustration of the PAK1 protein from Protein Data Bank.

(PhysOrg.com) -- Research published last week in the journal *PNAS* may have identified a promising new target for developing drugs against one of the most common types of lung cancer.

Oxford University researchers have helped a team at biotech company Genentech in South San Francisco look at the role of a [protein](#) called PAK1 in the growth of tumours.

PAK1 is a protein involved in a biochemical cascade used by [cells](#) in the body to control things like cell growth, division, and survival. Other proteins in this pathway have been implicated in cancer – when these controls go wrong, they can lead to uncontrolled cancerous growth.

Dr. Adrian Jubb and colleagues at the Weatherall Institute of Molecular Medicine at Oxford were able to develop a test to look at levels of PAK1 in lung tissue samples from a tissue bank in Oxford. They showed that PAK1 was found at higher levels in one type of [lung cancer](#), specifically the squamous type of non-small-cell lung cancer.

Building on these observations, the Genentech team were then able to show that knocking out the PAK1 protein stopped the growth of cells from these human lung cancers in the lab. Similarly, inhibiting PAK1 could impair growth of these tumours in mice.

Importantly, results also showed that combining an attack on PAK1 with other targeted therapies that Genentech is developing might kill off the cancer cells.

This suggests that such combination drug therapies might be a promising new avenue in searching for new treatments for non-small-cell lung cancer.

Certainly, lung cancer (of all types) is one of the most difficult cancers to treat, and has one of the lowest survival rates of any type of cancer. Fewer than 10 per cent of lung cancer patients survive the disease beyond five years after diagnosis. It is often diagnosed at a late stage and it tends to occur in older people who may also have other medical conditions.

Non-small-cell lung cancer accounts for around 85 per cent of all lung cancer cases, with around 30,000 people are diagnosed with this form of

the disease each year in the UK.

Non-small-cell lung cancers can be further divided into three types: squamous cell carcinomas, adenocarcinomas, and large cell carcinomas.

Squamous cancers are the most common type of lung cancer, and are often due to smoking. It is squamous cancers that have been identified as having raised levels of PAK1 in this study.

Beyond doing what's already possible with surgery, radiotherapy and chemotherapy, options for drug treatments of non-small-cell lung cancer are limited.

"Non-small-cell lung cancer is an unmet clinical need," says Adrian Jubb. "We simply need more effective treatments.

"We have demonstrated that targeting PAK1 has anti-tumor activity. And we now have a platform for assessing whether PAK1 is also worth pursuing for other squamous cancers, such as head and neck cancers, or other tumours including melanoma and pancreatic [cancer](#)."

More information: www.pnas.org/content/early/2011/04/19/1103350108.abstract

Provided by Oxford University

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