KRAS mutation A treatment target

Lung Foundation Australia

Over the past 15 years our understanding of cancer has changed dramatically. There is now a much greater understanding of the role that our genes play in cancer development. Researchers have identified numerous mutations and cell markers which can be linked to how a cancer behaves and grows. This type of research has enabled treatments to be developed which specifically target the mutation or cell marker. These treatments, called targeted therapies, have revolutionised the way some cancers are treated, giving greater response to treatment and sometimes fewer side effects.

What is a mutation?

A mutation is damage or a change that happens to a gene which can cause a cell to be abnormal. This damage, or change, can be due to multiple factors which may be environmental or genetic, or in many instances, the cause may not be known. A mutation causes a change in cell behaviour, and this is what triggers the cell to grow abnormally. This incorrect growth is called cancer.

What are biomarkers?

Cell markers, or biomarkers, are different from mutations. Cell markers can be seen on the outside of or within a cell. When there is a change in the structure or too much of a cell marker 'expressed' by a cell, this can also change their behaviour, causing the cell to grow and divide in a way that it should not.

A number of mutations and cell markers have been identified in lung cancer, such as EGFR, ALK and ROS1. These mutations have specific treatments available to target them when they are found in lung cancers.

KRAS explained

KRAS is another gene which can carry a mutation. KRAS is pronounced KAY – RAS and stands for Kirsten Rat Sarcoma viral oncogene homolog. KRAS is a gene which helps to control the cell growth pathway. All cells in the body have a pattern of development, growth, and death. The KRAS gene

helps to start the process. When the KRAS gene doesn't function properly, cells do not grow and mature normally, or die when they are supposed to. All cells must live and die in a balanced pattern in the body. If this pattern is out of balance (too few or too many cells) illnesses, including cancer, may occur.

KRAS mutations can been seen in a number of different cancers including lung, colorectal, pancreatic, and endometrial cancer. In lung cancer, researchers have found different types of KRAS mutations (G12C, G12V, G12D). However, developing a successful treatment to specifically target the KRAS mutation has been difficult.

KRAS-G12C and KRAS-G12V are the two most commonly seen mutations, and are mostly found in adenocarcinoma, a type of non-small cell lung cancer. In some cases, it is thought that the presence of these KRAS mutations may help plan cancer treatment and potentially indicate treatment response, however, this has not been proven in clinical trials. Ask your oncologist about mutation testing, and if there is a specific type of mutation or cell marker present in your cancer.

Future treatments for KRAS

An enormous amount of research has, and continues, to be done on the KRAS mutation. Being able to target treatment toward this mutation would be of significant benefit to many cancer patients. With the different types of KRAS mutations, this has been difficult, however treatments directed at KRAS-G12C are currently in clinical trials. Doctors are continually looking to drive clinical research that gives the best possible treatment to their patient that will also give them the best possible outcome.

FURTHER INFORMATION AND SUPPORT

Contact Lung Foundation Australia for more information, to access our support services and join our mailing list for regular updates and latest news.

Lung Foundation Australia Services

- Information and Support Team
- Lung disease information resources
- Education webinars
- Lung Cancer and Respiratory Support Nurses
- Support groups
- Peer-to-peer connections
- Referral to pulmonary rehabilitation and Lungs in Action exercise programs
- E-newsletter

Lungfoundation.com.au | Freecall 1800 654 301 | enquiries@lungfoundation.com.au

This factsheet has been developed with support from Amgen Australia.

Published: May 2021