

Scientists crack gene code of common cancers

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This undated illustration shows the DNA double helix. Two common forms of cancer, skin and lung cancer, have been genetically mapped for the first time, British scientists announced, in a major breakthrough in understanding the diseases.

Two common forms of cancer have been genetically mapped for the first time, British scientists announced, in a major breakthrough in understanding the diseases.

The maps have exposed the [DNA mutations](#) that lead to skin and lung cancers, in a discovery scientists said could transform the way these diseases are diagnosed and treated in coming years.

All cancers are caused by damage to genes -- mutations in DNA -- that can be triggered by environmental factors such as tobacco smoke, harmful chemicals or ultraviolet radiation, and causes cells to grow out of control.

Scientists from Britain's Wellcome Trust Sanger Institute and their collaborators have mapped this [genetic damage](#) from the tumours of two patients suffering from lung cancer and malignant melanoma, a deadly skin cancer.

"This is a fundamental moment in cancer research. From here on in we will think about cancers in a very different way," said Professor Mike Stratton who led the institute's cancer genome project.

"Today for the first time, in two individual cancers, a melanoma and a lung cancer, we have provided the complete list of abnormalities in DNA in each of those two cancers," he told the BBC.

"We now see uncovered all the forces that have generated that cancer and we now see all the genes that are responsible for driving those two cancers."

The scientists' research, published in the journal Nature, also gained deeper insights into the way the body tries to repair the damage caused by the cancers and stop the disease spreading.

Stratton said the research could in future change the way cancers are treated -- by using genetic maps to find the defects that caused them.

"Now that we have these comprehensive complete catalogues of mutations on individual cancers, we will be able to see how each cancer developed, what were the exposures, what were the environmental factors and that's going to be key for our understanding generally of how cancers develop," he said.

"And for our individual patients, we will see all the genes that are abnormal and are driving each cancer and that's really critical, because that will tell us which drugs are likely to have an effect on that particular

cancer and which are not."

Peter Campbell, a cancer-genomics expert involved in the research, said the number of mutations discovered -- 33,345 for melanoma -- and 22,910 for [lung cancer](#) -- was remarkable.

"It is amazing what you can see in these genomes," he said on the website of the [journal Nature](#).

The research shows most mutations could be traced to the effects of chemicals in [tobacco smoke](#) (in the lung tumour) or ultraviolet light (in the melanoma tumour), supporting the idea that they are largely preventable.

"Every pack of cigarettes is like a game of Russian roulette," he said.

"Most of those mutations will land where nothing happens in the genome and won't do major damage, but every once in a while they'll hit a [cancer gene](#)."

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