Smokers with Y chromosome at especially high risk for developing cancer

Here's another reason for men to quit smoking. Aside from the well-known dramatic increase it causes in the risk of lung cancer, smoking has now been found to obliterate a chromosome in blood cells that could offer vital protection against cancer growth elsewhere in the body.

The chromosome in question is the Y chromosome, which is almost exclusively found in men. This means its smoking-induced loss is a male-only trait, which may help to explain why men who smoke are on average between 1.5 and 2 times as likely as women who smoke to develop non-respiratory cancers.

The study in 6,000 Swedish men found that smokers were, on average, three times as likely as nonsmokers to lose Y chromosomes from their blood cells.

"We think the loss or damage occurs when chromosomes segregate ready for cell division," says Jan Dumanski of Uppsala University in Sweden, who led the study.

Because the Y chromosome is the smallest in the human genome, and is not vital for cells to survive, the traditional view is that it can be lost without any negative consequence. But evidence is now mounting that the loss of the Y chromosome may be more harmful than previously assumed, possibly limiting the immune system's ability to combat cancer.

Earlier this year, the same researchers reported from a separate study in 1150 elderly men that loss of the Y chromosome from at least one-fifth of their blood cells almost doubled their risk of early death, shortening life by an average of 5.5 years. Additionally, it almost quadrupled their risk of developing certain types of cancer (*Nature Genetics*, DOI: 10.1038/ng.2966).

The team's latest research shows that the effect of smoking on chromosomes is "dose related" – the more cigarettes men smoked, the greater the number of their blood cells that lost the Y chromosome. If the losses are as large in other types of cell elsewhere in the body, this would potentially explain the raised risk of cancers.

The good news, however, is that Y chromosome levels in former smokers were the same as those in non-smokers. "The most important message is that this is reversible, so when you stop smoking, you no longer have the increased accumulation of cells that lose the Y chromosome," says Dumanski.

Read full, original article: Y men are more likely to get cancer than women