

Study shows smoking doesn't always mean a shortened life span or cancer

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Smoking has been shown to have drastic consequences for lifespan and disease progression, and it has been suggested that cigarette exposure may impact the risk of death and disease via its acceleration of the aging process. Not all smokers experience early mortality, however, and a small proportion manage to survive to extreme ages.

Using long-lived smokers as their phenotype, the authors of a study published today in *The Journals of Gerontology, Series A: Biological Sciences & Medical Sciences* identified a network of SNPs (a DNA sequence variation occurring commonly within a population) that allow certain individuals to better withstand environmental damage (like smoking) and mitigate damage. Collectively, these SNPs were strongly associated with high survival rates.

Morgan E. Levine, corresponding author of the study, said: "We identified a set of genetic markers that together seem to promote longevity. What's more, many of these markers are in pathways that were discovered to be important for aging and lifespan in animal models. There is evidence that these genes may facilitate <u>lifespan</u> extension by increasing cellular maintenance and repair. Therefore, even though some individuals are exposed to high levels of biological stressors, like those found in cigarette smoke, their bodies may be better set up to cope with and repair the damage."

These findings suggest that longevity, rather than being entirely determined by environmental factors, may be under the regulation of



complex genetic networks which influence stress resistance and genomic stability. Therefore, there is reason to believe that long-lived smokers represent a biologically distinct group, endowed with genetic variants allowing them to respond differentially to environmental stressors.

Genomic instability also happens to be one of the hallmarks of cancer pathogenesis, and so the same genes that may promote survival among smokers may also be important for cancer prevention. This is consistent with the findings of the study, which showed that the genes identified were associated with a nearly 11% lower cancer prevalence.

More information: The full report, "A Genetic Network Associated with Stress Resistance, Longevity, and Cancer in Humans" is available online here: <u>biomedgerontology.oxfordjourna</u> ... 8/gerona.glv141.full

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