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Hum Mol Genet：吸烟改变了我们的基因

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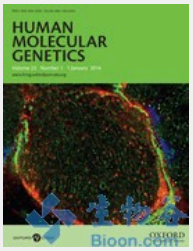
时下普遍接受的观点是：吸烟是一个相当大的健康风险因素。近日，来自Uppsala和Uppsala临床研究中心的新研究结示，吸烟会导致些许基因的变化，导致吸烟者出现健康问题（如癌症和糖尿病）。

出生时，我们从我们的父母那里继承基因。但以后的生活中，遗传物质可通过表观遗传修饰而改变。这种变化通常化引起的，但环境因素和生活方式也会造成变化。

最近发表在*Human Molecular Genetics*杂志上的研究，研究人员已经研究了基因是如何在吸烟者和非烟烟草使用者中的。他们可以找出大量基因在吸烟者中发生变化，但在非吸烟者中却未找到类似变化。

早期研究发现，吸烟者患糖尿病和多种癌症的危险性增加，此外，吸烟者免疫防御和精子的质量降低。现在，该研究果还表明，增加癌症和糖尿病风险的基因，或者对于免疫应答或精子质量重要的相关基因，会受到吸烟的影响。（生Bioon.com）



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Smoke related DNA methylation changes in the etiology of human disease

Welisane Besingi, et al.

Exposure to environmental and lifestyle factors, such as cigarette smoking affect the epigenome and might mediate risk for diseases and cancers. We have performed a genome-wide DNA methylation study to determine the effect of smoke and snuff (smokeless tobacco) on DNA methylation. A total of 95 sites were differentially methylated (FDR q-values<0.05) in smokers and a subset of the differentially methylated loci were also differentially expressed in smokers. We found no sites, neither any biological functions or molecular processes enriched for smoke-less tobacco related differential DNA methylation This suggests that methylation changes are not caused by the basic components of

the tobacco but from its burnt products. Instead we see a clear enrichment (FDR q-value<0.05) for genes, including CPOX, CDKN1A, and PTK2, involved in response to arsenic-containing substance, which agrees with smoke containing small amounts of arsenic. A large number of biological functions and molecular processes with links to disease conditions are also enriched (FDR q-value<0.05) for smoke related DNA methylation changes. These include “insulin receptor binding”, and “negative regulation of glucose import” which are associated with diabetes, “positive regulation of interleukin-6-mediated signaling pathway”, “regulation of T-helper 2 cell differentiation”, and “positive regulation of interleukin-13 production” which are associated with the immune system, and “sertoli cell fate commitment” which is important for male fertility. Since type 2 diabetes, repressed immune system and infertility have previously been associated with smoking; our results suggest that this might be mediated by DNA methylation changes.