# New link between smoking and brain damage – Radiocápsula RCP/CPR [1]

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## Calificación:

Researchers, led by Debapriya Ghosh and Dr Anirban Basu from the Indian National Brain Research Center (NBRC), have found that a compound in tobacco provokes white blood cells in the central nervous system to attack healthy cells, leading to severe neurological damage. The research centers on a compound known as NNK, which is common in tobacco. NNK is a pro-carinogen, a chemical substance which becomes carcinogenic when it is altered by the metabolic process of the body. Unlike alcohol or drug abuse NNK does not appear to harm brain cells directly, however, the research team believe it may cause neuro-inflamation, a condition which leads to disorders such as Multiple Sclerosis. "Considering the extreme economical and disease burden of neuro-inflammation related disorders, it is extremely important from a medical, social and economic point of view to discover if NNK in tobacco causes neuro-inflammation" said Ghosh. To prove if such a link exists the team conducted two types of tests, one outside of a living host in glass and one in laboratory mice. The team used blot analysis techniques which showed that the introduction of NNK resulted in a clear increase in pro-inflammatory signaling proteins, pro-inflammatory effector proteins and other stress related proteins. Increased levels of pro-inflammatory cytokines, which act as molecular messengers between cells, were also detected. This shows that NNK provokes an exaggerated response from the brain's immune cells, known as microglia. Microglia cells act as 'destroyers' for the brain by attacking damaged or unhealthy cells. However, when provoked by NNK these cells start to attack healthy brain cells

rather than the unhealthy cells they are supposed to attack. "Our findings prove that tobacco compound NNK can activate microglia significantly which subsequently harms the nerve cells," said Basu. While other harmful side effects of smoking, such as lung disease, usually derive from tar or smoke this research suggests damage is not confined only to smoking. NNK is present in all forms of tobacco and therefore it can also enter the body through chewing. The study also suggests that second hand smoking may lead to the same neuro-inflamation conditions. Concentrations of NNK in tobacco can vary from 20-310 nanograms in cigarettes. However, NNK is also present in the smoke itself, smoke-filled air indoors may contain up to 26 nanograms of NNK. This means that both direct and second-hand smoking can lead to substantial measures of NNK intake. "This research sheds light on the processes that lead to nerve cell damage in those who smoke cigarettes or consume tobacco products on regular basis," said Ghosh. Contact: Ben Norman Benorman@wiley.com [2] 44-124-377-0375 Wiley-Blackwell

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