

Solving the mystery of how cigarette smoking weakens bones

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(Medical Xpress) -- Almost 20 years after scientists first identified cigarette smoking as a risk factor for osteoporosis and bone fractures, a new study is shedding light on exactly how cigarette smoke weakens bones. The report, in ACS' *Journal of Proteome Research*, concludes that cigarette smoke makes people produce excessive amounts of two proteins that trigger a natural body process that breaks down bone.

Gary Guishan Xiao and colleagues point out that previous studies suggested toxins in [cigarette smoke](#) weakened bones by affecting the

activity of osteoblasts, cells which build new bone, and osteoclasts, which resorb, or break down, old bone. Weakening of the bones, known as osteoporosis, can increase the risk of fractures and is a major cause of disability among older people. To shed light on how cigarette smoking weakens bones, the scientists analyzed differences in genetic activity in bone marrow cells of smokers and non-smokers.

They discovered that human smokers produce unusually large amounts of two proteins that foster production of bone-resorbing osteoclasts compared to non-smokers. Experiments with laboratory mice confirmed the finding.

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More information: “Smoke-Induced Signal Molecules in Bone Marrow Cells from Altered Low-Density Lipoprotein Receptor-Related Protein 5 Mice”, *Journal of Proteome Research*, 2012, 11 (7), pp 3548–3560. [DOI: 10.1021/pr2012158](https://doi.org/10.1021/pr2012158)

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