



PRESS RELEASE

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A grape constituent protects against cancer

Scientists at UNIGE discovered that a molecule found in grape skin and seeds can protect against lung cancer when administered by the nasal route.

Lung cancer is the deadliest form of cancer in the world, and 80% of death are related to smoking. In addition to tobacco control, effective chemoprevention strategies are therefore needed. A team of scientists from the University of Geneva (UNIGE), Switzerland, studied a well-known natural product, resveratrol, which is found in grapes and in red wine. While its chemopreventive properties against cancers affecting the digestive tract have been documented by previous studies, resveratrol has so far shown no effect on lung cancers. Thanks to nasal administration, the UNIGE team obtained very promising results in a study conducted in mice and described in the journal *Scientific Reports*.

«We tried to prevent lung cancer induced by a carcinogen found in cigarette smoke by using resveratrol, an already well-documented molecule, in a mouse model,» explains Muriel Cuendet, Associate Professor in the School of pharmaceutical sciences of the UNIGE Faculty of Science. This 26 week long study contained four groups of mice. The first one, the control, received neither carcinogen nor resveratrol treatment. The second received only the carcinogen, the third received both the carcinogen and the treatment, and the fourth received only the treatment. «We observed a 45% decrease in tumor load per mouse in the treated mice. They developed fewer tumors and of smaller size than untreated mice,» says Muriel Cuendet. When comparing the two groups that were not exposed to carcinogen, 63% of the mice treated did not develop cancer, compared to only 12.5% of the untreated mice. «Resveratrol could therefore play a preventive role against lung cancer,» she continues.

This formulation is applicable to humans

However, resveratrol does not seem suitable for preventing lung cancer: when ingested, it is metabolized and eliminated within minutes, and therefore does not have time to reach the lungs. «This is why our challenge was to find a formulation in which resveratrol could be solubilized in large quantities, even though it is poorly soluble in water, in order to allow nasal administration. This formulation, applicable to humans, allows the compound to reach the lungs,» explains Aymeric Monteillier, a scientist in the School of pharmaceutical sciences of the UNIGE Faculty of Science, and the first author of the study. The resveratrol concentration obtained in the lungs after nasal administration of the formulation was 22 times higher than when taken orally. The chemoprevention mechanism is probably related to apoptosis, a pro-



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«We observed a 45% decrease in tumor load», explains Muriel Cuendet, Associate Professor in the School of Pharmaceutical Sciences of the UNIGE Faculty of Science.

High resolution pictures

cess by which cells program their own death and from which cancer cells escape. The UNIGE research team will now focus on finding a biomarker that could contribute to the selection of people eligible for preventive treatment with resveratrol.

Towards a preventive treatment?

Resveratrol is an already well-known molecule, which is found in food supplements, meaning that no further toxicological study would be needed prior to commercialisation as a preventive treatment. «This discovery is unfortunately of little economic interest to pharmaceutical groups. The molecule is indeed simple and non-patentable and cancer prevention studies require a follow-up over many years,» regrets Muriel Cuendet, without excluding the development of preventive treatment in humans.

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