

Bitter receptor involved in anti-inflammatory effect of resveratrol?

March 2 2021



Credit: Pixabay/CC0 Public Domain

Resveratrol is a plant compound found primarily in red grapes and Japanese knotweed. Its synthetic variant has been approved as a food ingredient in the EU since 2016. At least in cell-based test systems, the

substance has anti-inflammatory properties. A recent collaborative study by the Leibniz Institute for Food Systems Biology at the Technical University of Munich and the Institute of Physiological Chemistry at the University of Vienna has now shown that the bitter receptor TAS2R50 is involved in this effect. The team of scientists led by Veronika Somoza published its results in the *Journal of Agricultural and Food Chemistry*.

Bitter food ingredients not only influence the taste of a food, but often also exert other physiological effects. For example, resveratrol not only tastes bitter, but also reduces biomarkers of inflammation as shown in various clinical trials including, e.g., patients with metabolic syndrome and related disorders. No research group had yet investigated whether bitter receptors also play a role in this.

Gum cells as a test system

To investigate this question, the team led by Veronika Somoza carried out experiments with a human cell line derived from a gum biopsy. The cells of this cell line are a suitable test system for investigating interactions between bitter substances, bitter receptors and the release of inflammatory markers. As the team shows for the first time, these cells have active bitter receptor genes and are also immunocompetent. That is, when the cells are treated with surface antigens from bacteria that trigger gingival inflammation, they release quantifiable amounts of the inflammatory marker interleukin-6.

Resveratrol reduces inflammatory markers

In the current study, resveratrol reduced the amount of inflammatory marker released by about 80 percent. Additional administration of the bitter-masking substance homoeriodictyol reduced this anti-inflammatory effect by about 17 percent. "This is remarkable because

homoeriodictyol is a natural substance that has been shown to reduce the bitterness of food ingredients mediated via certain bitter receptors. These receptors include the bitter receptor TAS2R50, which is also expressed by the [cells](#) of our test system," explains Veronika Somoza, deputy director of the Institute of Physiological Chemistry in Vienna and director of the Leibniz Institute in Freising. Additional knock-down experiments performed by the researchers as well as computer-assisted structure-function analyses support this finding. "Therefore, it is reasonable to conclude that this receptor type is involved in mediating the anti-inflammatory resveratrol effect," Somoza says.

She adds: "Of course, there is still a great deal of research to be done. Nevertheless, the study results already provided new insights to help elucidate the molecular interactions between bitter-tasting [food](#) ingredients, bitter receptors and immune responses. In the future, it will also be exciting to find out whether bitter substances and bitter [receptors](#) could play a role with regard to inflammatory gum diseases such as periodontitis."

More information: Johanna Tiroch et al, Bitter Sensing TAS2R50 Mediates the trans-Resveratrol-Induced Anti-inflammatory Effect on Interleukin 6 Release in HGF-1 Cells in Culture, *Journal of Agricultural and Food Chemistry* (2021). [DOI: 10.1021/acs.jafc.0c07058](https://doi.org/10.1021/acs.jafc.0c07058)

Provided by Leibniz-Institut für Lebensmittel-Systembiologie an der TU München

Citation: Bitter receptor involved in anti-inflammatory effect of resveratrol? (2021, March 2) retrieved 23 June 2024 from <https://phys.org/news/2021-03-bitter-receptor-involved-anti-inflammatory-effect.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.