

Antibiotics may help to treat melanoma

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Some antibiotics appear to be effective against a form of skin cancer known as melanoma. Researchers at KU Leuven, Belgium, examined the effect of these antibiotics on patient-derived tumors in mice. Their findings were published in the *Journal of Experimental Medicine*.

Researchers from KU Leuven may have found a new weapon in the fight

against melanoma: antibiotics that target the '[power plants](#)' of cancer cells. These antibiotics exploit a vulnerability that arises in tumor cells when they try to survive [cancer therapy](#).

"As the cancer evolves, some melanoma cells may escape the treatment and stop proliferating to 'hide' from the immune system. These are the cells that have the potential to form a new tumor mass at a later stage," explains cancer researcher and RNA biologist Eleonora Leucci (KU Leuven). "In order to survive the [cancer treatment](#) however, those inactive cells need to keep their 'power plants'—the mitochondria—switched on at all times." As mitochondria derive from bacteria that, over time, started living inside cells, they are very vulnerable to a specific class of antibiotics. This is what gave us the idea to use these antibiotics as anti-melanoma agents."

The researchers implanted patient-derived tumors into mice, which were then treated with antibiotics—either as the only treatment or in combination with existing anti-melanoma therapies. Leucci: "The antibiotics quickly killed many cancer cells and could thus be used to buy the precious time needed for immunotherapy to kick in. In tumors that were no longer responding to targeted therapies, the antibiotics extended the lifespan of—and in some cases even cured—the mice."

The researchers worked with antibiotics that are now, because of rising [antibiotic resistance](#), only rarely used in bacterial infection. However, this resistance has no effect on the efficacy of the treatment in this study, explains Leucci. "The [cancer cells](#) show high sensitivity to these antibiotics, so we can now look to repurpose them to treat cancer instead of bacterial infections."

However, patients with melanoma shouldn't start experimenting, warns Leucci. "Our findings are based on research in mice, so we don't know how effective this treatment is in human beings. Our study mentions

only one human case where a melanoma patient received antibiotics to treat a bacterial infection, and this re-sensitized a resistant melanoma lesion to standard therapy. This result is cause for optimism, but we need more research and clinical studies to examine the use of [antibiotics](#) to treat cancer patients. Together with oncologist Oliver Bechter (KU Leuven/UZ Leuven), who is a co-author of this study, we are currently exploring our options."

More information: Roberto Vendramin et al, Activation of the integrated stress response confers vulnerability to mitoribosome-targeting antibiotics in melanoma, *Journal of Experimental Medicine* (2021). [DOI: 10.1084/jem.20210571](https://doi.org/10.1084/jem.20210571)

Provided by KU Leuven

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