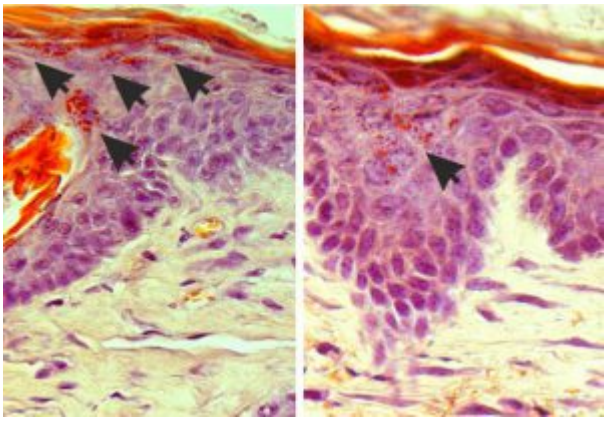
Using Light to Stop Itch Could Provide Relief From Skin Diseases

ROME, Jan. 3, 2019 – Scientists at the European Molecular Biology Laboratory (EMBL) in Rome have used light to stop itch – at best an annoyance and at worst an uncomfortable chronic symptom – in mice. They used NIR light to activate a phototoxic agent that selectively targets itch-sensing cells, which are located in the upper surface of the skin. When the agent is injected into a mouse's affected skin area and the area is illuminated with the NIR light, the itch-sensing cells withdraw from the skin, reducing itch-associated behaviors in the mouse and allowing the skin to heal. The researchers said that the effect of the treatment can last several months.

The light-sensitive agent binds only to those nerve cells that sense itch. Other types of nerve cells in the skin, which cause sensations like pain, vibration, cold, or heat, are not affected by the light treatment.



The researchers said that the method works well in mice with eczema (atopic dermatitis) and in mice with amyloidosis (familial primary localized cutaneous amyloidosis), a genetic skin disease for which there is currently no cure. "For me, the most exciting part of this project was seeing the

improvements in the animals' health," said researcher Linda Nocchi. "Their skin looked much better after treatment and they scratched less." "We hope that one day, our method will be able to help humans suffering from a disease like eczema, which causes chronic itching," said group leader Paul Heppenstall. It is already known that mice and humans have the same target molecule for itch therapy – a small protein called interleukin 31 (IL-31). One of the team's next steps will be to test the light therapy in human tissues.

Previously, the Heppenstall group published a method to manage chronic pain with light. "We think that the mechanism we've discovered might be a general method for controlling sensation through the skin. Our goal now is to take these therapies further. We want to collaborate with industry partners to develop therapies for humans, but also for veterinary medicine, as itch is a major problem in dogs as well," Heppenstall said.

For more information: https://doi.org/10.1038/s41551-018-0328-5