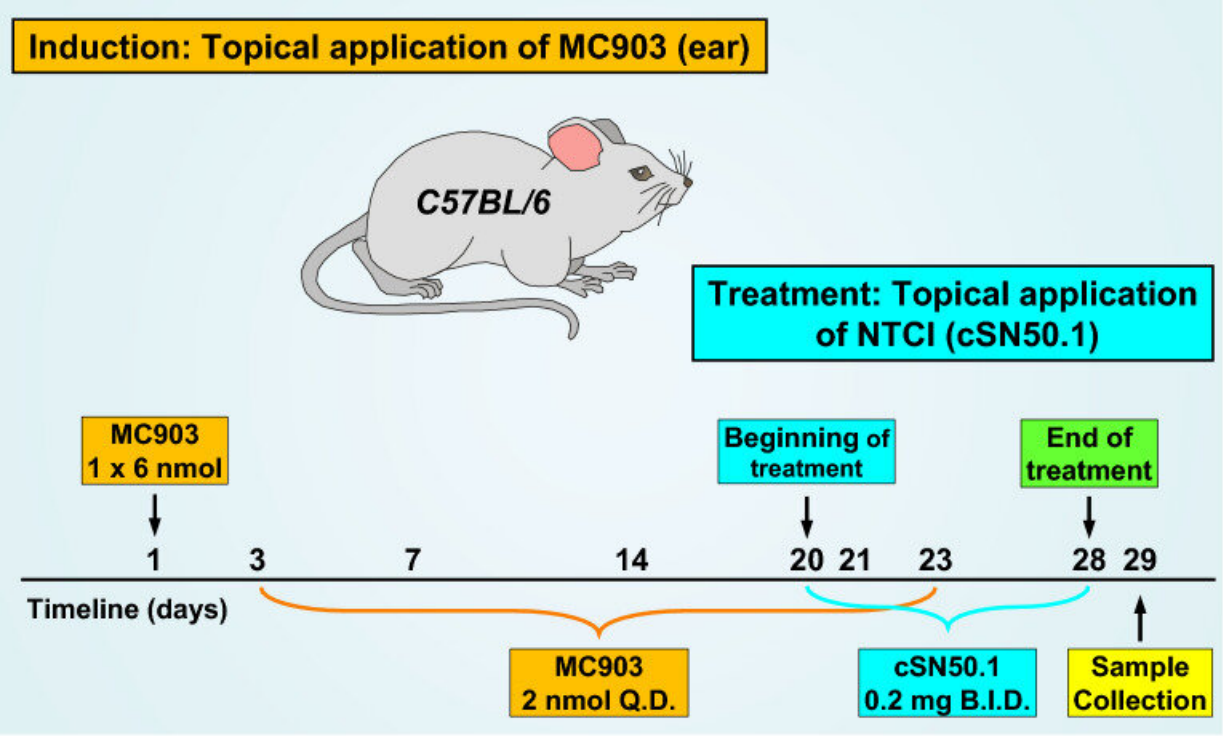
Scientists test new way to treat eczema

January 12 2023



Graphic Depiction of Experimental Atopic Dermatitis and Treatment Protocol. Atopic dermatitis (AD)-like phenotype was induced in 8-week-old C57BL/6 female mice by topical application of MC903 (calcipotriol), an analog of vitamin D3. On day 1, an initial bolus dose of 6 nmoles of MC903 was applied topically to the right ear (3 nmoles on each side of the ear). On day 3, dosing once a day (Q.D.) with 2 nmoles of MC903 (1 nmole on each side of the right ear) was begun and continued for 3 weeks. On day 20, a 9-day twice-daily (B.I.D.) topical treatment with 66 nmoles NTCI (cSN50.1 peptide, 33 nmoles on each side of the right ear), or an equal volume of NTCI vehicle (10 µl saline on each side of the right ear) was initiated. Mice were weighed and ear thickness was measured every 2–4 days. Ear samples were collected on day 29 for gene expression and

Immunohistochemistry (IHC) analyses. Mice in the Mock Control group were only subjected to the measurements of body weight and the ear thickness. Credit: *Scientific Reports* (2022). DOI: 10.1038/s41598-022-23042-x

Researchers at Vanderbilt University Medical Center have developed a new investigational drug that can block inflammatory signaling in a preclinical model of atopic dermatitis—eczema.

Eczema, the most common recurrent inflammatory skin disorder, afflicts an estimated 10 to 20% of children and 5% of adults worldwide, with the highest incidence among African Americans. Symptoms and signs include intense itching, and skin rash with oozing and crusting lesions that can become infected, and which can disrupt sleep and daily activities.

Treatment for severe cases of eczema includes immunosuppressive drugs to control inflammation, monoclonal antibodies that counteract inflammatory proteins called cytokines or their receptors, and antibiotics to fight infection. These treatments will not cure or fully control eczema, however, and some of the drugs can cause significant side effects.

In comparison, the peptide drug developed by the VUMC researchers silenced cytokine-expressing genes, suppressed skin infiltration by inflammatory cells, and healed skin lesions, all without apparent toxicity, at least in the animal model.

"We unraveled the mechanism of eczema by demonstrating that we can control at least 15 genes responsible for the production of the major mediators of skin inflammation," said the lead investigator, Jacek Hawiger, MD, Ph.D., Distinguished Professor of Medicine and Louise B. McGavock Professor at VUMC.

Hawiger and his colleagues reported their findings Nov. 7 in the journal *Scientific Reports*. The topical drug, which is applied directly to inflamed skin, is now being tested in a multicenter clinical trial in patients with eczema.

More information: Yan Liu et al, Genomic control of inflammation in experimental atopic dermatitis, *Scientific Reports* (2022). DOI: 10.1038/s41598-022-23042-x