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## The role of a TRPM8-agonist in the human perception of wetness across different body sites [conference abstract]

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# The role of a TRPM8-agonist in the human perception of wetness across different body sites

Oliver Typolt, Davide Filingeri

THERMOSENSELAB, Environmental Ergonomics Research Centre, Loughborough University, Loughborough, UK

## Introduction

Sensing wetness is a common and important skin sensation, yet humans have no hygroreceptors. Cold sensing nerve fibers drive wetness perception, yet it is unknown whether the cold sensing ion channel TRPM8 expressed on those fibers also contributes to wetness sensing. The aim of the study was to determine regional difference in wetness sensitivity to a TRPM8-agonist, i.e. menthol.

## Methods

Sixteen males ( $25\pm 3.4$ y; body fat  $19\pm 8\%$ ) underwent a quantitative sensory test in a neutral environment ( $24\pm 0.5^\circ\text{C}$ ;  $51\pm 5\%$  RH), consisting of reporting perceived thermal, wetness and pleasantness sensations (Likert scales) resulting from a short-duration application ( $< 2$ min) of either a 0.5% menthol cream, a control aqueous cream, and a cold-dry stimulus ( $15^\circ\text{C}$  below skin temperature), to 12 different skin sites (area:  $\sim 2\text{cm}^2$ ) over the front and the back of the body. Tympanic temperature ( $T_{\text{tym}}$ ), mean and local skin temperatures ( $T_{\text{sk}}$ ) were recorded throughout the testing.

## Results

Baseline  $T_{\text{tym}}$  and mean  $T_{\text{sk}}$  were  $36.8\pm 0.4^\circ\text{C}$  and  $31.5\pm 0.6^\circ\text{C}$  respectively. The application of the 0.5% menthol cream induced wetness sensations that differed regionally ( $p=0.041$ ), with the forehead presenting the greatest sensitivity ( $-1.1\pm 0.9$  vote) and the neck one of the lowest ( $-0.4\pm 0.5$  vote). However, menthol-induced wetness sensations were significantly smaller in magnitude than those induced by the cold-dry stimulus ( $-2.0$  vote [95%CI  $-1.6, -2.3$ ];  $p<0.001$ ), and no different to the sensations induced by the control aqueous cream ( $+0.1$  vote [95%CI  $-0.3, +0.4$ ];  $p=0.897$ ).

## **Conclusion**

The TRPM8-agonist menthol did not independently induce wetness perceptions. The strength of the menthol cream, and the application duration, might have limited the potential for this TRPM8-agonist to trigger wetness perceptions. Future studies should therefore consider quantity and timing as important parameters to determine the role of TRPM8 and cold sensing in wetness perception.