Itch is the major symptom of many allergic or inflammatory skin diseases; yet it is still difficult to measure objectively. Human studies on the physiology and pathophysiology of the itch sensation (e.g. functional magnetic resonance imaging studies) have been hampered by the lack of an efferent and manageable "on-off" stimulus. Here, a short-term temperature-modulated human histamine itch model is presented. In nine healthy right-handed male volunteers (age 29 +/- 2.6 years), 1% histamine dihydrochloride was used in the skin prick model as standard itch stimulus on the right forearm with subsequent thermal modulation of the target skin area using a Medoc TSA II NeuroSensory Analyzer thermode. Modulation occurred in rapid alternating order from 32 degrees C (neutral) to 25 degrees C (slight cold) and vice versa; each temperature block lasted 20 seconds. Subjective itch ratings were recorded using a computerized visual analog scale (VAS) and - for qualitative assessment - the Eppendorf Itch Questionnaire (EIQ). All subjects reported localized itch sensations without pain; mean VAS itch intensity was 50.6 +/- 3.5% during the 25 degrees C blocks and 33.8 +/- 3.9% during the 32 degrees C blocks (P<0.0001). Also, mean EIQ ratings were significantly higher related to the 25 degrees C blocks. In spite of the common knowledge that intensive cold can inhibit itch sensation, a reproducible, significant
enhancement of histamine-induced itch by short-term moderate temperature decrease could be shown. This effect might be explained by peripheral and central adaptation processes triggered by alternating afferent activity patterns and might be used - owing to its “on/off” characteristics - in future itch physiology studies such as functional magnetic resonance imaging.