

Individual differences in irritation from Ibuprofen covary with Olive Oil but not Capsaicin

Samantha M Bennett¹ and John E Hayes¹

¹ Department of Food Science, Penn State, State College, PA

Ibuprofen and oleocanthal, a natural irritant in extra virgin olive oil, are unique among chemesthetic stimuli. Unlike most irritants, they are locus specific, triggering irritation mostly in the throat, which is predominately a tickle rather than a burn. Ibuprofen and oleocanthal also share structurally similar motifs, have similar anti-inflammatory properties, and elicit variable irritation across people. Collectively, this is seen as evidence they share a common receptor that may be unique to the throat, a view buttressed by data that oleocanthal intensity is unrelated to carbon dioxide irritation. Subsequent work suggests CO₂ irritation occurs via TRPA1 but not TRPV1, so the role of TRPV1 remains unclear. Here, we compare irritation elicited by ibuprofen, extra virgin olive oil and capsaicin, the prototypical TRPV1 agonist, in 30+ participants. Intensity for burn, stinging/pricking, itch, tingle, warm/hot, numb and tickle was collected in replicate over 180s with the generalized labeled magnitude scale (gLMS). From the time intensity profiles, maximum intensity (I_{max}) and area under the curve (AUC) were extracted for each individual. Across participants, tickle predominated for olive oil and ibuprofen versus burn for capsaicin, although multiple qualities were used for all stimuli. For both AUC and I_{max}, olive oil and ibuprofen were highly correlated, whereas ibuprofen and capsaicin irritation were not. Unexpectedly, olive oil and capsaicin were also correlated. In summary, these data support the hypothesis that ibuprofen and oleocanthal share a common receptor, and this mechanism is likely TRPV1 independent, due to the absence of a relationship between the irritation from ibuprofen and capsaicin. The olive oil-capsaicin correlation suggests unknown TRPV1 agonists may be present in olive oil.

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