

# Modeling human flavor perception

Carmel A Levitan<sup>1</sup>, Maya U Shankar<sup>1</sup>, John Prescott<sup>2</sup>, Charles Spence<sup>1</sup>

<sup>1</sup>Department of Experimental Psychology, University of Oxford;

<sup>2</sup>School of Psychology, University of Newcastle

Flavor is a complex phenomena that arises from multiple unisensory sources combined into an integrated multisensory percept. By applying computational approaches refined in work on sensory modalities such as vision and audition, the present program of research aims to model human flavor perception. One set of experiments examined interactions between taste compounds and found that interactions between tastes such as sweet and sour are non-linear. For instance, we found that in sweet solutions, addition of a sour compound can lead to both a bias and an increase in noise for discriminating levels of sweetness; these effects increase as the intensity of the sour compound is increased. Another set of experiments has examined the role of color in modulating flavor perception. We have measured color-flavor associations in different populations of participants and demonstrated that they vary, likely due to cultural experience. We also have shown that simple manipulations of color can change flavor qualities, though the effects of the manipulations depend upon prior expectations about color-flavor correlations. Thus flavor perception arises not only from sensory cues, but is modulated by higher level knowledge about interactions between information from different modalities.