Tasting biofilms: bitter taste receptors as mediators of bacteria-host communication

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Humans can taste many compounds but are able to distinguish between five basic tastes, which are bitter, sweet, umami, salt and sour. In humans, bitter taste is sensed by a family of 25 G protein-coupled receptors (GPCRs), referred to as T2Rs. Significant progress in the T2R field over the past few years has altered our fundamental perception of the roles of these GPCRs. The traditional view that taste receptors are confined to the oral cavity and involved in taste sensation has been challenged with the discovery of these T2Rs in many extraoral tissues. In this talk, I will discuss the progress we have made in the discovery of these T2Rs in different tissues and pathophysiological states. Our results suggest that T2Rs are activated by quorum sensing molecules and antibiotics. We propose that T2Rs play a significant role in mediating innate immunity and susceptibility or protection from bacterial infection.