

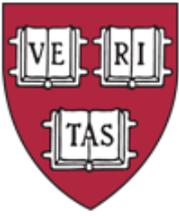
Fatal Attraction: harnessing olfactory receptors to make flavors and fragrances universally appetitive

Investigator: Bob Datta



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HARNESSING OLFACTORY RECEPTORS TO MAKE FRAGRANCES AND FLAVORS UNIVERSALLY APPETITIVE

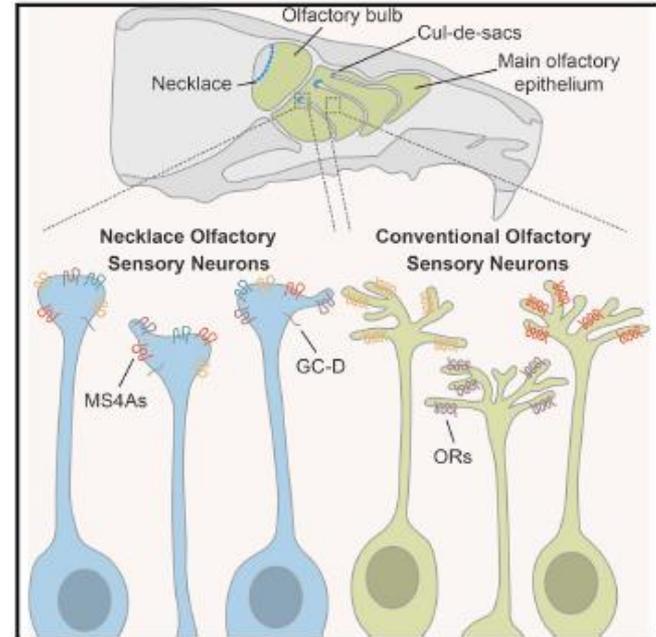
Bob Datta, M.D., Ph.D.

Associate Professor of Neurobiology, Harvard Medical School

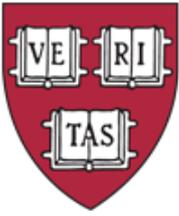
Partnering Interests: Collaboration, Licensing

Background

- Prof. Bob Datta and his team at Harvard Medical School have discovered a new class of odorant receptors, MS4As, that is **structurally distinct** from previously known receptors
 - MS4A receptors are expressed on guanylyl cyclase D (GC-D) positive olfactory sensory neurons
 - GC-D positive neurons are accessory cells of the **“necklace” subsystem** that resides in the recesses of the olfactory epithelium
- Like the MS4A ligands, many of the molecules previously shown to trigger activity within the necklace olfactory system also have **innate meaning for mice**



In fact, data from the literature suggests that stimulating the cells on which the MS4A receptors reside, can **significantly increase food intake** in mice by hijacking innate preference mechanisms



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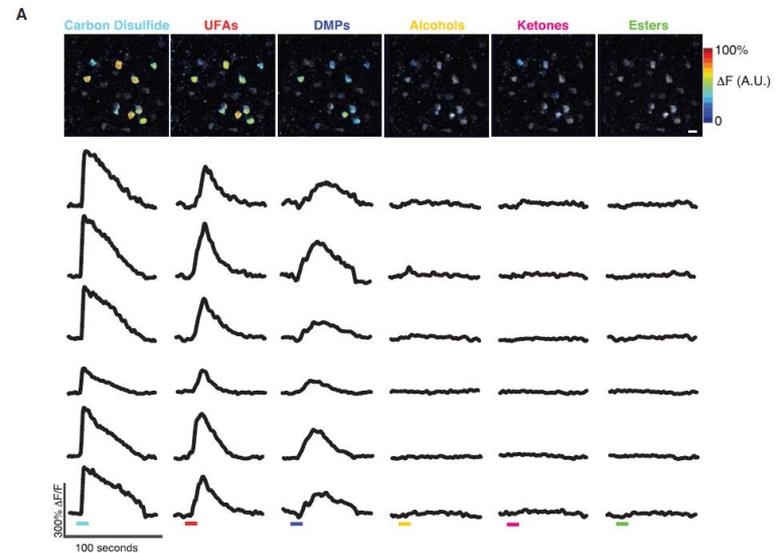
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Application of the Technology

- The team developed a series of *in vitro* and *in vivo* assays to identify small-molecule ligands capable of activating specific members of this receptor class
- Ligands for the MS4A receptors are enriched for food odors and pheromones
- Compounds activating the MS4A receptors could be used as **food or fragrance additives** that make moderately appetitive stimuli more **appetitive**
- These safe additives, based on completely novel biology, could provide **more salient and attention-grabbing cues, stimulating learning and attentional processes that make food more palatable**

Example Traces of Necklace Cell Response to MS4A Ligands



The science of the MS4As represents the first truly new opportunity to develop a new class of compounds with the potential to influence human and animal olfactory perception



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Future Directions

- Ongoing research focuses on screening and validation of ligands that activate MS4As
- Promising compounds will be tested in behavioral assays to determine level of influence over olfactory behavior

Opportunity

- The screening platform developed by Bob Datta has the potential to unlock numerous naturally-occurring ligands to create unique additives to food and/or fragrances
- The science of the MS4As represents the first truly new opportunity to develop a new class of compounds with the potential to influence human and animal olfactory perception

About the Investigator

- Sandeep Robert (Bob) Datta is an Associate Professor of Neurobiology at Harvard Medical School, where his research focuses on characterizing the neural basis for innate behaviors. Bob is an entrepreneurial faculty member who is currently working on a number of start-ups.