



The Department of Nutritional Sciences Spring 2022 Seminar Series

“The Molecular Basis of Olfactory Olfactory Receptor Gene Choice”

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Host: Malcolm Watford, D.Phil.
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Wednesday, February 23, 2022 @ 2:15 PM
Zoom Meeting Link: <https://go.rutgers.edu/Monahan-Seminar>

Mammals detect environmental odorants using olfactory receptor proteins that are expressed by olfactory sensory neurons. Mammalian genomes contain hundreds of genes encoding olfactory receptor proteins, but each sensory neuron makes only one type of receptor by expressing only one allele of one receptor gene. This combination, hundreds of receptors but only one type of receptor per cell, makes possible the remarkable breadth and specificity of our sense of smell, and contrasts with other senses, such as taste, where neurons co-express multiple receptors with the same valence (e.g. sweet, bitter). We are investigating the molecular mechanisms that control olfactory receptor gene expression. We have found that singular olfactory receptor gene expression by mature neurons depends on the 3-dimensional organization and packaging of DNA within the nucleus, which orchestrates the transcriptional activation of the chosen olfactory receptor gene and the transcriptional silencing of the non-chosen receptor genes. Ongoing work in the lab is investigating olfactory neuronal progenitors with the goal of understanding how these nuclear structures form and how olfactory receptor choice leads to the expression of a diverse repertoire of receptor genes.

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