

Buchthal, Joanna

Joanna Buchthal, PhD (candidate)

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A scientist, entrepreneur, and designer, Joanna is currently pursuing her PhD in the Sculpting Evolution Group at the MIT Media Lab. Her research is focused on preventing Lyme and other tick-borne diseases by engineering heritably resistant white-footed mice, the primary reservoir of the pathogens that cause many tick-borne illnesses in the Northeast. As the Project Manager and a resident of Martha's Vineyard, she has been pioneering an open and community-guided approach to her research by involving her own community at every stage, a model of engagement she hopes will spread throughout science. Previously, she has worked as a researcher at Harvard Medical School, Massachusetts General Hospital, and at NASA's Habitability Design Center, and as COO of a natural language processing start-up. She holds a BFA in industrial design from Rhode Island School of Design.

Mice Against Ticks: Community-Guided Research for Public Health

Few areas are as afflicted by Lyme as the islands of Martha's Vineyard and Nantucket, which have some of the highest rates of infection in the nation. Mice Against Ticks is an open, community-guided project which aims to safeguard these islands by reducing the number of disease-carrying ticks. Because most ticks become infected when they bite infected white-footed mice, scientists are working to create tick-borne disease resistant white-footed mice that are capable of passing their

resistance to their offspring. If a large number of resistant mice were released onto an island like Martha's Vineyard or Nantucket, they would introduce immunity to the native mouse population by breeding with the local mice, deplete the local disease reservoir and dramatically reduce the population of infected ticks. Mainland mouse populations within individual towns could be similarly immunized using daisy threshold technology being developed in Dr. Kevin Esvelt's lab at MIT. Uniquely, the communities of Martha's Vineyard and Nantucket have been involved in the project from the outset, providing direction before any experiments were conducted in the lab. Mice Against Ticks will be guided by public feedback as we aim to provide a long-lasting, safe and eco-friendly solution to this growing public health challenge.