Hi! We’re scientists from the Dunn Lab in the Department of Applied Ecology at North Carolina State University, and we study the biodiversity and ecology of microbes in things like Sourdough bread, insects and in human homes, Ask us anything!

Microbes live everywhere, and are linked to everything we do. The Dunn lab aims to tell the stories of the small species – whether on our bodies, in our homes or our backyards – that humans interact with every day but tend to ignore. The ecology and evolution of these species has barely begun to be explored. We are tackling the unknown with the help of the public, through citizen science research.

Here are some of our projects:

**The Sourdough Project:** Humans have baked bread for over 10,000 years. All over the world, different cultures bake their own unique breads – and have for centuries. Yet we know almost nothing about the microbes that truly make a traditional sourdough bread. We have collected over 500 sourdough starters from 17 countries and are now engaging middle school students to grow and study their own starters, on a quest to understand the microbial zoos that transform flour and water into fluffy, nutritious, aromatic bread.

**The Crop Mutualist Project:** Crop plants have many kinds of mutualists. Flies, bees, and wasps pollinate many crops and in many cases those relationships are specific. But others of the mutualists are smaller, they include the fungi and bacteria that aid plant roots in finding nutrients and also the fungi and bacteria that dwell in and on plant leaves and, in doing so, help to defend them against pathogens and, in some cases, against pests. It is these microscopic partners on which we will initially focus.

**The Great Pumpkin Project:** We are documenting the insects and microbes that visit all cucurbit plants, including pumpkins (which are native to the Americas) and cucumbers (which are native to Asia). These plants are now grown and enjoyed throughout the world, yet we know very little about the microbes and insects that grow with them.

**The Wild Life of Our Homes:** Human homes are often considered to be unique from the environments in which we evolved. Though we now spend most of our lives indoors, it has only been in recent years that we have started to fully explore the diversity of microbes which colonize and persist in these spaces. With the help of citizen scientists, our lab has studied the differences among interior surfaces within homes from North America (e.g., how microbial communities vary on pillows compared to toilet seats). We are now expanding this research to include differences in home design, as well as to consider how our species interactions may have changed throughout human history.

We’re doing this AMA as part of the National Human Genome's National DNA Day Reddit AMA series to celebrate how genomics is used in our everyday lives. Ask us anything about our work on microbial ecology in guts, crops, homes, sourdough, and other fermented foods!

Your hosts today are:

**Dr. Rob Dunn,** professor of applied ecology

**Dr. Erin McKenney,** postdoctoral researcher studying microbial community dynamics and the relationship between taxonomy, function, and niche space in sourdough and guts. I’m interested in coupling research and education, and I am also a blacksmith.

**Dr. Anne A. Madden,** postdoctoral researcher studying the bacteria and fungi of diverse environments (not limited to fermented foods and beverages, insects, and built environments) and developing human applications from these insights.
Dr. Lori Shapiro, postdoctoral researcher studying how agricultural systems change selective pressures on plant-insect and plant-microbe interactions. I use cucurbits as model systems to investigate how landscape scale changes associated with agriculture affect crop mutualists.

Megan Thoemmes, doctoral candidate studying the interface between the human body and the indoor environment. I am interested in how our species interactions have changed over time, as our homes have become more permanent and further removed from the natural world.

Lauren Nichols, research technician studying how species adapt to their environment and how this affects inter-species interactions and evolutionary diversification, particularly in the context of anthropogenic environmental changes.

Learn more about the Dunn lab: http://robdunnlab.com/

Learn more about our citizen science projects: http://studentsdiscover.org/

Ongoing work in the Dunn lab considers the role of wasps and ants in traditional vineyards, the biology of pants, the potential value of microbes in camel crickets to industrial waste remediation, and the biology of foods such as sourdough bread. In general, Dr. Dunn uses insights from basic ecology and evolution to make new discoveries but also to achieve applied goals.

The AMA is still in progress

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