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Talk title

Plants with jobs: metabolic engineering to make crops solve unconventional problems in sustainable agriculture

Abstract

The vast majority of agricultural land is dedicated to feeding livestock, which means there is a so-far-missed opportunity to use our feed crops not just as bulk nutrition, but as a way to solve big problems in the animals that eat them. I will talk about engineering of plant secondary metabolites—some well known, some not—into livestock feed plants as a way to make the animals more productive, efficient, and sustainable. First, I will discuss screening of plant metabolites across 4 chemical families for beneficial effects on ruminant methane emissions, feed efficiency, and gastrointestinal nematodes. Then, I will cover the engineering of biosynthetic pathways for some of these metabolites in elite grain and pasture crops. Finally, I will discuss a distinct branch of work with plants engineered for direct atmospheric removal of agricultural superpollutants. I will end the talk by briefly touching on some perspective about taking plant biotech into application via a startup, and the entrepreneurship path for students in this field.