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ENGINEERING *PICHIA PASTORIS* TO MAKE THE IMPOSSIBLE BURGER POSSIBLE

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Using animals as a cheap way to make meat has brought us to the brink of environmental collapse. At Impossible foods, we're trying to reduce the impact of animal farming on the planet by creating a delicious burger made entirely out of plant materials. A key driver of flavor in beef is heme, a molecule found in animal muscle in the form of the hemoprotein myoglobin. We have engineered the methylotrophic yeast *Pichia pastoris* to produce a similar plant hemoprotein called Leghemoglobin, which is found naturally in soybean root nodules. Leghemoglobin is the "magic meatless ingredient" in Impossible beef.

In the last few decades, *Pichia pastoris* has been used for production of several heterologous proteins of industrial relevance. In my talk, I will share a few examples of novel, *rational* strain engineering approaches that have led to improved expression of Leghemoglobin. I will highlight how an integrated approach to strain development, fermentation development, analytics and downstream processing enabled successful production of Leghemoglobin at commercial scale, leading to product commercialization and market expansion.