

## SPECIAL SEMINAR

# Influence of Microbial Intelligence on the Future of Bio-Manufacturing

DATE: Nov. 22, 2023

TIME: 2-3:30PM

LOCATION: CHBE 102

Decades of research have finally led to manufacturing nature-identical animal and plant proteins, without any animal inputs, using precision fermentation. Precision fermentation uses glucose from plant sources and GRAS microflora that have been designed to produce alternate proteins. The microflora is suitably engineered and then cultivated to produce the product protein, which is then purified to over 95% purity and spray dried / lyophilised for shipment to customers. Analytical methods are used at every step, in line with regulatory requirements, to ensure that the product is identical to the natural protein, and to verify the quality, safety, and consistency of the product. Appropriate functionality studies and methods similarly validate that the product behaves identically to the natural protein and is devoid of any toxicity or allergenicity.

Precision fermentation science and other biotechnology-derived innovations are creating new categories of foods which offer a sustainable and nutritious way to feed our growing population. According to an ISO-conformant lifecycle assessment, these fermentation-based production processes reduce greenhouse gas emissions up to 97% compared to traditional production methods. The novel technological platform Perfect Day has developed thereby offers a way to realize planet-positive impact on food security in a way that doesn't compromise on taste, texture, or nutrition.

In this seminar, I will share how scientists can and need to unlock the full potential of synthetic biology and precision fermentation science. Multiple pain points need to be addressed simultaneously, and all of them must be targeted towards generating, not suggestive hypotheses, but rather precise conclusions driven by a rigorous scientific process and experimental data that are sourced from and validated at scale.



**SUNIL SUKUMARAN** serves as Chief Technology Officer at Perfect Day, Inc. a consumer biology company on a mission to create a kinder, greener tomorrow by developing new ways to make the foods you love today — starting in the dairy aisle. Perfect Day, Inc. is a leading-edge food bio/technology company in Berkeley, CA that has developed processes for creating dairy products by precision fermentation of microbiota, specifically from fungi in bioreactors, instead of extraction from dairy milk.

In his role, Sunil leads a global team of scientists, engineers, and researchers on the development and innovation of Perfect Day's technology. Sunil brings nearly two decades of expertise in food biotechnology to drive research and development in sustainable foods and food security. Sunil joined Perfect Day as the Head of Operations and Vice President of R&D, before being promoted to Chief Technology Officer. He was previously with Anthem Biosciences, where he served as the Head of R&D for a decade, responsible for establishing and leading the biology team to some of the most diverse and significant product developments, including innovative technologies currently being employed in hospitals across India. Through his mentorship of a team of talented innovators, during his time at Anthem Biosciences several Bio-manufacturing processes were transitioned from the lab into the vessel, at scales of tens of thousands of liters. Prior to Anthem Biosciences, he served as a Research Associate at the Institute of Molecular and Cell Biology. Sunil was also one of the 7 founding members of Syngene-Biology, India's biggest CRO that currently employs more than 7000 employees in several cities in India and Malaysia. Sunil's ability and dedication to bringing scientific rigor to the creative process of discovery allows companies to create new categories at an unprecedented pace. He sees the visionary goals of saving the planet and impacting lives not just today, but forever, as the motivation behind each scientific and technological discovery.

Sunil earned his PhD in biotechnology from Anna University and the University of Leicester and completed his post-doctoral training in microbial pathogenesis at the University of Southern California. He is passionate about the future of animal-free dairy and, with the rest of the Executive Leadership Team, is driving Perfect Day to its vision of building a more equitable, resilient, and diverse food system for all of us.