INFERBIOME: INFERRING GUT MICROBIOME STATES FROM STOOL MICROBIOME DATA

Tech ID: 34523 / UC Case 2026-087-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Traditional stool samples provide an indirect and often "blurred" snapshot of the complex microbial environment within the human gut, making it difficult to design precise health interventions. UC Berkeley researchers have developed InferBiome, a computational framework that reconstructs the actual state of the gut microbiome from stool data. By inverting a blurring model and applying a probability-based simulation of microbiome dynamics, the system predicts how different dietary interventions will impact an individual's unique gut ecosystem. This method allows for the selection of personalized dietary recommendations that maximize host health benefits by simulating outcomes across various possible microbiome states.

SUGGESTED USES

» Personalized Nutrition: Generating data-driven dietary plans tailored to an individual’s specific gut composition to improve metabolic health.

» Therapeutic Development: Testing the efficacy of prebiotic or probiotic formulations *in silico* before proceeding to clinical trials.

» Chronic Disease Management: Assisting in the management of conditions like Inflammatory Bowel Disease (IBD) or IBS through targeted dietary adjustments.

» Health and Wellness Platforms: Integrating predictive gut modeling into consumer apps for real-time nutritional guidance.

» Pharmaceutical Research: Modeling drug-microbiome interactions to understand how different treatments affect—and are affected by—the gut environment.

ADVANTAGES

» Enhanced Accuracy: Effectively accounts for the "blurring" effect inherent in stool samples to provide a more accurate representation of the internal gut environment.

» Dynamic Predictive Power: Moves beyond static snapshots by using microbiome dynamics models to simulate future responses to specific interventions.

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CONTACT

Michael Cohen
mcohen@berkeley.edu
tel: 510-643-4218.

INVENTORS

» KaazemPur-Mofrad, Mohammad Reza

OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
» Health
» **Computer**
» Software
» **Medical**
» Other
» **Research Tools**
» Bioinformatics
» Other

RELATED CASES

2026-087-0

Individualized Precision: Replaces generalized dietary advice with high-resolution, individual-specific recommendations based on complex biological data.

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Risk-Informed Recommendations: Evaluates a range of candidate compositions to ensure that recommended diets are effective across the most likely gut states.

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Reduced Trial-and-Error: Enables the digital testing of dietary changes, reducing the time and discomfort associated with traditional experimental dieting.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Metabiome: Metabolic Network And Biofilm Modeling Of The Gut Microbial

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University of California, Berkeley Office of Technology Licensing
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