Propelling the functional characterization of microbiomes with the Metaproteomics Initiative

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Abstract

Microbial communities strongly affect biogeochemical cycles, ecosystems, and human health. Although studying microbial functions in these incredibly diverse communities was once difficult, new approaches are making it easier. One such approach, metaproteomics, enables scientists to study changes in the expression of microbial proteins over space and time and provides important insights into gene-protein links and microbial functions. The new Metaproteomics Initiative seeks to establish a central hub for the discussion, standardization, and improvement of metaproteomics methods in order to foster interdisciplinary collaboration and advancement of this relatively new field of microbiome research. This initiative, sponsored by the European Proteomics Association, will feature a website, a social media presence, and various platforms and resources for education and communication. Its first tangible accomplishment was the Critical Assessment of Metaproteome Investigation (CAMPI), an international inter-laboratory comparison of protocols, which revealed the importance of standardization and paved the way for further inter-laboratory analyses. Interdisciplinary engagement, brainstorming, and training will also be critical in achieving the objectives. Although much work remains, the launch of the Metaproteomics Initiative is an exciting step toward comprehensive molecular characterization of microbial communities and will help optimize the returns on investment for microbiome research.