Next generation metagenomics: Exploring the opportunities and challenges

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A new expert review highlights the opportunities and methodological challenges at this critical juncture in the growth of the field of metagenomics. With important implications and applications in clinical

medicine, public health, biology, and ecology, metagenomics is benefitting from advances in high-throughput techniques and technology, while facing the challenges of big data storage and analysis, according to the review article published in *OMICS: A Journal of Integrative Biology*, the peer-reviewed interdisciplinary journal published by Mary Ann Liebert, Inc., publishers.

Ilaria Laudadio, Valerio Fulci, Laura Stronati, and Claudia Carissimi, at Sapienza University of Rome, Italy, coauthored the article entitled "Next Generation Metagenomics: Methodological Challenges and Opportunities." Metagenomics provides a view into the genetic composition of microbial communities, whether from environmental, human, or other types of samples. The authors identify the major bottlenecks in current metagenomic experimental design and data reporting and analysis. They discuss the differences in previous shotgun metagenomics approaches to the more recent technological developments such as single-cell metagenomics. They also focus on advances in the intriguing field of functional metagenomics and identify the need for greater standardization to allow for the proper comparison of data produced by different research groups.

Vural Özdemir, MD, Ph.D., DABCP, Editor-in-Chief of *OMICS: A Journal of Integrative Biology* states: "Metagenomics is a sophisticated example of what omics and systems sciences offer to both human and planetary health. Metagenomics is of interest not only to cell biologists and medical and environmental scientists, but also to physicians and healthcare specialists in need of new approaches to medical diagnostics and therapeutics. Dr. Carissimi and coauthors highlight the actionable targets for metagenomics, as well as what the future holds in this new frontier of systems sciences. For readers seeking to rapidly grasp the nuances of metagenomics, this concise expert review is a thoughtful and timely resource."

More information: Ilaria Laudadio et al, Next-Generation Metagenomics: Methodological Challenges and Opportunities, *OMICS: A Journal of Integrative Biology* (2019). DOI: 10.1089/omi.2019.0073