

GENOMIC APPROACHES IN EARTH AND ENVIRONMENTAL SCIENCES

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The first comprehensive synthesis of genomic techniques in earth sciences

The past 15 years have witnessed an explosion of DNA sequencing technologies that provide unprecedented insights into biology. Although this technological revolution has been driven by the biomedical sciences, it also offers extraordinary opportunities in the earth and environmental sciences. In particular, the application of "omics" methods (genomics, transcriptomics, proteomics) directly to environmental samples offers exciting new vistas of complex microbial communities and their roles in environmental and geochemical processes. This unique book fills the gap where there exists a lack of resources and infrastructure to educate and train geoscientists about the opportunities, approaches, and analytical methods available in the application of omic technologies to problems in the geosciences.

Genomic Approaches in Earth and Environmental Sciences begins by covering the role of microorganisms in earth and environmental processes. It then goes on to discuss how omics approaches provide new windows into geobiological processes. It delves into the DNA sequencing revolution and the impact that genomics has made on the geosciences. The book then discusses the methods used in the field, beginning with an overview of current technologies. After that it offers in-depth coverage of single cell genomics, metagenomics, metatranscriptomics, metaproteomics, and functional approaches, before finishing up with an outlook on the future of the field.

- The very first synthesis of an important new family of techniques
- Shows strengths and limitations (both practical and theoretical) of the techniques
- Deals with both theoretical and laboratory basics
- Shows use of techniques in a variety of applications, including various aspects of environmental science, geobiology, and evolution

Genomic Approaches in Earth and Environmental Sciences is a welcome addition to the library of all earth and environmental scientists and students working within a wide range of subdisciplines.

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 Also available
as an e-book

ISBN 978-1-118-70824-8



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