



Article review: Multi-omics for studying and understanding polar life

Angelika Graiff and Julia Ehrlich

Institute of Biological Sciences, Applied Ecology and Phycology, University of Rostock, 18059 Rostock, Germany

Correspondence: Angelika Graiff (angelika.graiff@uni-rostock.de)

Received: 6 March 2024 – Published: 24 April 2024

Clark, M. S., Hoffman, J. I., Peck, L. S., Bargelloni, L., Gande, D., Havermans, C., Meyer, B., Patarnello, T., Phillips, T., Stoof-Leichsenring, K. R., Vendrami, D. L. J., Beck, A., Collins, G., Friedrich, M. W., Halanych, K. M., Masello, J. F., Nagel, R., Norén, K., Printzen, C., Ruiz, M. B., Wohlrab, S., Becker, B., Dumack, K., Ghaderiardakani, F., Glaser, K., Heesch, S., Held, C., John, U., Karsten, U., Kempf, S., Lucassen, M., Paijmans, A., Schimani, K., Wallberg, A., Wunder, L. C., and Mock, T.: *Multi-omics for studying and understanding polar life*, *Nat. Commun.*, 14, 7451, <https://doi.org/10.1038/s41467-023-43209-y>, 2023.

This article was initiated by a topic workshop in the frame of the German Research Council Priority Program 1158 “Antarctic Research with Comparative Investigations in Arctic Ice Areas”. This topic workshop was on “Polar Genomics” and took place in Bielefeld from 16–18 May 2022. Organized by Joe Hoffman and his team from the University of Bielefeld, the aim of the workshop was to bring together international researchers working on the genomics of polar organisms. Over the course of 2.5 d, 37 participants from six countries presented and discussed objectives, approaches, and recent progress using genomic methods to study patterns of biodiversity, adaptations to the polar environment, and responses to environmental changes in polar organisms. Joe Hoffman, Melody Clark, and Svenja Heesch organized a special issue on “Polar Genomics”, with 14 original contributions from the topic workshop in collaboration with the peer-reviewed open-access journal *Genes*. In addition, the organizers of this topic workshop submitted a *Nature Communications* article entitled “Multi-omics for studying and understanding polar life”, with all participants serving as coauthors.

This paper was recently published and provides a comprehensive insight into applying multi-omics techniques to explore and understand life in polar regions. The authors present a wealth of data and findings based on a wide range of molecular and genetic analyses. The strength of the article lies in the detailed presentation of the methods used and the precise description of the results. The authors show how multi-omics techniques can help researchers understand the adaptability and resilience of organisms in extreme environments. Another positive aspect of the article is the emphasis on the importance of long-term studies and collaboration between different disciplines. This allows researchers to paint a comprehensive picture of polar ecosystems and better understand the possible impacts of climate change on these regions.

However, it should be noted that due to its technical depth and complexity, the article may not be suitable for readers unfamiliar with the basics of genetics and molecular biology. Some prior knowledge is required to fully understand and appreciate the information presented.

Overall, the article, “Multi-omics for studying and understanding polar life”, is an inspiring resource for scientists and researchers interested in applying multi-omics techniques in polar research, as it identifies many knowledge gaps. It provides a comprehensive overview of the current state of research and shows how these techniques can help explore the unique biodiversity and adaptability of polar habitats.

Financial support. This research has been supported by the DFG Priority Program 1158 “Antarctic Research with Comparative Investigations in Arctic Ice Areas” (grant no. KA899-30-15).

Disclaimer. Publisher's note: Copernicus Publications remains neutral with regard to jurisdictional claims made in the text, published maps, institutional affiliations, or any other geographical representation in this paper. While Copernicus Publications makes every effort to include appropriate place names, the final responsibility lies with the authors.