



OPEN ACCESS

EDITED AND REVIEWED BY

Michael Kassiou,
The University of Sydney, Australia

*CORRESPONDENCE

Jinxiang Han,
✉ samshjx@sina.com

RECEIVED 07 October 2023

ACCEPTED 11 October 2023

PUBLISHED 23 October 2023

CITATION

Wang L, Lu X and Han J (2023), Editorial:
Current trends in the applications
of bioluminescence.
Front. Chem. 11:1309070.
doi: 10.3389/fchem.2023.1309070

COPYRIGHT

© 2023 Wang, Lu and Han. This is an
open-access article distributed under the
terms of the [Creative Commons
Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use,
distribution or reproduction in other
forums is permitted, provided the original
author(s) and the copyright owner(s) are
credited and that the original publication
in this journal is cited, in accordance with
accepted academic practice. No use,
distribution or reproduction is permitted
which does not comply with these terms.

Editorial: Current trends in the applications of bioluminescence

Lijuan Wang¹, Xixue Lu² and Jinxiang Han^{3*}

¹College of Traditional Chinese Medicine, Shandong University of Traditional Chinese Medicine, Jinan, China, ²Neck-Shoulder and Lumbocruural Pain Hospital of Shandong First Medical University, Shandong Academy of Medical Sciences, Jinan, China, ³NHC Key Laboratory of Biotechnology Drugs, Biomedical Sciences College, Shandong First Medical University, Shandong Academy of Medical Sciences, Jinan, China

KEYWORDS

editorial, biophoton, traditional Chinese medicine, bioluminescence imaging, non-invasive diagnostic instrument

Editorial on the Research Topic

Current trends in the applications of bioluminescence

The field of biophoton is expanding at an accelerated rate. Biophoton is one of the most prominent characteristics of biological organisms. Decades have been devoted to the exhaustive study of biophoton, with researchers focusing on elucidating the mechanisms underlying its generation and investigating its diverse properties. Biophoton, as a promising non-invasive diagnostic instrument, possesses substantial potential and utility for the examination of complex biological systems. Biophoton has been linked to electron transfer processes and the production of reactive oxygen species within the metabolic framework for many years. Its initial application, entrenched in the evaluation of the quality and safety of Chinese herbs, marked a significant turning point. Currently, biophoton encompasses diverse fields, including biology, clinical medicine, chemistry, and traditional Chinese medicine. However, the scope of diseases currently under investigation remains limited, and exhaustive data are urgently needed to strengthen the foundation of biophoton research. Researchers are simultaneously weaving a tapestry of omics techniques and biophoton to decipher the complex theories and mechanisms governing the physiology and pathology of organisms. This convergence gives disciplines including traditional Chinese medicine and clinical medicine new vitality.

Bioluminescence Imaging (BLI) has been developed by expanding upon the foundation of biophoton research and its practical applications. BLI is a cutting-edge technique used to visualize physiological processes in animals, bridging a significant void in the non-invasive monitoring of experimental animals. It enables the observation of multiple physiological processes in real time without necessitating euthanasia, including the non-invasive surveillance of the regulation of islet beta cell function. BLI has the potential to considerably advance pharmacological and physiological research. In recent years, the limitations of single-modal imaging have been addressed by the development of multimodal imaging technology. As an optical imaging technique, BLI provides non-invasive, real-time imaging that precisely identifies the locations and physiological processes of specific cells as well as their interactions with adjacent cells. BLI has predominantly been a preclinical technology, but it has the potential to become a clinical tool for diagnosing and treating human diseases, despite substantial obstacles.

In order to maintain a clinical focus and enhance our involvement in basic science, metabolism, and other clinically relevant areas, the compilation of new research findings in this field will

undoubtedly contribute to its future development. We look forward to collaborating with you in the sphere of biophoton in the future years.

Author contributions

LW: Conceptualization, Investigation, Writing–original draft, Writing–review and editing. XL: Writing–review and editing. JH: Writing–review and editing.

Acknowledgments

The increasing number of manuscript submissions to *Frontiers in Chemistry* reflects our journal's enduring success. This remarkable accomplishment is the result of the unwavering dedication of our esteemed authors, the meticulous reviews conducted by our council of experts, the perseverance of our section editors, and the invaluable advice of our editorial

advisory board. Our deepest gratitude goes out to everyone who has contributed to our journal thrive throughout the years.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.