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# Life analysis: bridging analytical innovations and multiscale exploration of life systems

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"Life Analysis" is a newly emerging branch of analytical chemistry, which was proposed by an innovative research group at Nanjing University in 2003. It has been taking shape since the late 1990s through the integration of analytical chemistry with life sciences, clinical medicine, physics, and materials science [1]. This emerging interdisciplinary field aims to investigate various components and structural units of substances in life systems, as well as their dynamic changes during interaction processes. It seeks to establish new principles, methods, and techniques for the detection and tracing of biomolecules in biological processes, enabling the rapid, highly sensitive, highly specific, and highly accurate qualitative and quantitative monitoring of biological substances. Furthermore, it facilitates molecular recognition and the extraction of biological information.

This field addresses key analytical challenges in life science research and the development of advanced biotechnology, providing powerful research methods and analytical approaches to meet the qualitative and quantitative requirements in life science research and human health-related fields. It also serves as a driving force for original innovation in analytical chemistry and related interdisciplinary areas. Life Analysis has become an important foundation for original innovation in life sciences and related fields, while providing essential scientific support for the development of new devices and instruments.

*Life Analysis* (ISSN 3105-9015 (Print) & 3105-9023 (Online)) is a fully open-access, peer-reviewed and online-only international academic journal dedicated to publishing high-quality research findings on innovative measurement principles, analytical methods, and detection technologies in the field of life sciences. It will provide a new platform for researchers and industry experts to publish their work. It will be published quarterly, and will be edited by an international team of experts active in analytical chemistry, biomedicine, life sciences, and related interdisciplinary fields, with the aim to promote knowledge sharing and ensure that high-quality scientific achievements benefit a broader global readership.

*Life Analysis* covers but is not limited to: new principles, methods and technologies in biological and biomedical analysis, single-molecule and single-cell analysis, high-resolution imaging and *in situ* detection,

biomolecule recognition and bioimaging, life cycle and aging research, multi-omics analysis, identification of new disease biomarkers, bioinformatics and artificial intelligence-driven analysis, development of analytical instruments and biosensors, as well as the applications of life analysis technology in precision medicine, health monitoring, environment, materials, energy, agriculture, and food.

This founding issue includes six featured articles as significant contributions that demonstrate the versatility and impact of life analysis technology:

In recent years, potentiometry-based *in vivo in situ* analytical techniques have made significant progress in life sciences and medical research. "Recent advance in *in vivo* potentiometry for probing brain chemistry" by Prof. Zhang from Renmin University of China reviews the latest research progress of potentiometric sensors for brain sensing, including sensing materials, potential response mechanisms and their applications in the *in vivo* analysis of brain neurochemistry, and prospects future development in this field [2].

"Electrochemiluminescence biosensing of biomarkers and bioimaging of cellular functional molecules" by Prof. Wei and Prof. Ju summarizes representative classes of electrochemiluminescence (ECL) luminophores along with their characteristic properties and recent applications, recent advances in ECL biosensing for *in vitro* detection of biomarkers, and cutting-edge applications of ECL imaging at single-cell level, and outlines the current challenges and future directions in ECL biosensing and imaging [3].

In the third article, Prof. Lin and Prof. Yang from Xiamen University summarize the state-of-the-art sequencing-based spatial transcriptomics, with a primary emphasis on the methodologies, introduce two major categories of typical nucleic acid barcoding platforms (in situ barcoding-based and barcoding array-based) for spatial localization and transcriptome profiling, and highlight metabolic RNA labeling-based spatiotemporal transcriptomics and its perspectives [4].

The fourth article by Prof. Deng and Prof. Sun from National Center for Nanoscience and Technology and University of Chinese Academy of Sciences reviews recent advances in microfluidic technologies for biochemical analysis, focusing on various readout modalities and their applications in detecting molecules, extracellular vesicles, and cells [5]. This review also discusses the challenges and future perspectives of AI-enhanced and wearable microfluidic biochemical devices.

"Targets for cancer diagnostic imaging" by Prof. Li and Prof. Tang from Shandong Normal University and Laoshan Laboratory summarizes recent advances in cancer imaging targets, including extracellular, membrane-associated, and intracellular biomarkers, and discusses emerging imaging strategies as well as their limitations and future opportunities toward intelligent, real-time, and systems-level cancer diagnosis and monitoring for precision oncology [6].

Notably, "Retarded migration-based elimination of interferences in LC flow path for ultrasensitive and accurate quantification of DNA N6-methyladenine (6mA)" as the first research article of this journal, by Prof. Lai and Prof. Wang from Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences and University of Chinese Academy of Sciences, designs a flow path 6mA migration-retardation separation approach using two tandem LC columns to eliminate flow path-derived 6mA contamination for MS analysis, which achieves a limit of quantification of approximately $5 \times 10^{-18}$ mol and corrects significant overestimation caused by conventional LC methods in mammalian cells [7]. This method enables accurate and ultrasensitive quantification of DNA 6mA.

We cordially invite submissions of high-quality manuscripts in various types, including original research articles, review papers, perspectives and short communications, and hope that you will join us in helping to make the journal a success.

## References

[1] Ju H. Chapter 1.2, Scientific outlook: prospects for the development of life analytical chemistry. In *2017 Scientific Development Report, Chinese Academy of Sciences*. Beijing: Science Press 2017. pp. 15–33.
[2] Liu R, Zhang M. Recent advance in *in vivo* potentiometry for probing brain chemistry. *Life Anal.* 2026, 1(1):0001.
[3] Li L, Dong X, Wei Q, Ju H. Electrochemiluminescence biosensing of biomarkers and bioimaging of cellular functional molecules. *Life Anal.* 2026, 1(1):0002.
[4] Wang Y, Lin J, Zhu Z, Lin S, Yang C. Next-generation sequencing-based spatiotemporal transcriptomics: the next wave of spatial transcriptomics. *Life Anal.* 2026, 1(1):0003.
[5] Lv J, Zhao S, Deng J, Sun J. Microfluidics for biochemical analysis: advances and perspectives. *Life Anal.* 2026, 1(1):0004.
[6] Gao P, Pan W, Li N, Tang B. Targets and strategies for cancer diagnosis and imaging. *Life Anal.* 2026, 1(1):0005.
[7] Lai W, Lu M, Mo J, Hou Z, Wang H. Retarded migration-based elimination of interferences in LC flow path for ultrasensitive and accurate quantification of DNA N6-methyladenine. *Life Anal.* 2026, 1(1):0006.