

Integration in Biomedical Science 2024: Emerging Trends in the Post-Pandemic Era

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The global landscape has witnessed profound transformations during the COVID-19 pandemic, which has concurrently catalysed notable advancements in scientific research while inflicting detrimental effects. The integration of diverse disciplines has yielded new theories and tools, thus offering innovative solutions to complex challenges within the biomedical field. A review of 2023 revealed a discernible evolution in the bioscience and medical fields in the post-pandemic era.

Advances in translational research has transcended the realm of mere conceptualization, manifesting as earnest endeavors through a series of innovative processes to yield tangible outcomes rather than perpetuating potentially speculative activities. One of the most compelling examples of this is the paradigm of vaccine development, with the wake of the pandemic prompting heightened awareness and exploration of opportunities in this domain for the past 3 years. A notable milestone in this trajectory was the 2023 Nobel Prize in Medicine awarded to Katalin Karikó and Drew Weissman, acknowledging their pivotal contributions to mRNA modification, which led to the rapid development of COVID-19 vaccines globally. Indeed, the scope of translational research in vaccines has extended beyond COVID-19 in the post-pandemic era. The success of mRNA-based COVID-19 vaccines has led to the exploration and development of mRNA-based influenza vaccines [1]. Noteworthy contributions continue to emerge, as evidenced in the second issue of *BIO Integration* in 2023, in which Wang and his team elucidated contemporary platforms and ongoing initiatives in developing self-assembled peptides as promising tumor vaccines. This finding represents the highly successful integration of vaccine technology, nanomedicine, and oncology [2]. The success stories in vaccine development not only instill optimism for the future of treatment but also provide exemplary models for the trajectory of translational research [3].

A momentous transformation was evidenced by the progression of intelligentization, marking a substantial transition from laboratory settings to practical applications in patient care. The impact of artificial intelligence (AI) has become increasingly pronounced, particularly in the context of and following the pandemic. Integrating diverse databases, advanced algorithms, and omics technologies have accelerated the integration of AI into human life. Bioscience researchers are now recognizing the importance of practical applications of AI rather than solely focusing on model precision. This shift is apparent as more researchers embrace and adeptly utilize AI to address challenges in bioscience

research. A recent tutorial by Sánchez-Herrero et al. in the third issue of *BIO Integration* in 2023 highlighted the incorporation of R code within PhysPK, which is a versatile bio-simulation and modeling software. This integration offers a novel approach to analyzing population pharmacokinetics and pharmacodynamics, demonstrating significant potential for advancing drug research and development [4]. AI in biomedicine is currently entering the era of clinical trials. According to the latest report, initiatives, such as “AI for early lung cancer diagnosis” and “Machine learning for patient triage,” were identified among the “11 clinical trials that will shape medicine in 2024” [5]. As we look to the future, the integration of AI into biomedicine holds great promise for transformative developments.

In concluding, it is with great pleasure that we highlight the Journal’s efforts in promoting cutting-edge medical research and interdisciplinary bioscience throughout 2023. Over the past year, the Journal has published over 25 meticulously peer-reviewed manuscripts, covering a broad range of pivotal subjects, such as precision medicine, gene therapy, drug discovery, and targeted imaging. Notably, the official release of the 2022 citation metrics in Scopus revealed that *BIO Integration* now boasts a CiteScore of 4.6 and SNIP of 0.868, securing a noteworthy rank of 22/79 in the “Biochemistry, Genetics and Molecular Biology (miscellaneous)” category. This achievement signifies a significant milestone, indicative of the growing recognition of the Journal within the scholarly community. Additionally, an important transition involved the adoption of a Continuous Article Publication (CAP) model, expediting the dissemination of accepted papers faster to benefit fellow researchers and readers alike. Access to the original document is now freely available on ScienceOpen (<https://www.scienceopen.com/>) and the Journal’s website (<https://bio-integration.org/>).

Beyond our commitment to fostering a communication platform for interdisciplinary research, we have actively invested in cultivating the innovative and scientific research capacities of interdisciplinary young talents. The inaugural *BIO Integration* Essay Writing Competition received a plethora of compelling papers from young talents worldwide. These contributions delved into a spectrum of opinions and experiences in interdisciplinary biosciences, encompassing topics, such as genome editing, 3D Bioprinting, AI in medicine, and stem cell therapy. Our heartfelt appreciation extends to the dedicated efforts of the Editorial Office staff, Editorial Board members, reviewers, and, most importantly, the esteemed authors and readers of *BIO Integration*. With

unwavering enthusiasm, we embrace these multifaceted changes and aspire to witness their continuity, fostering *BIO Integration* as a community-driven and cross-disciplinary

platform dedicated to facilitating excellence in the communication of pivotal advances for the global dissemination of interdisciplinary bioscience research.

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