

Holistic Integrative Biomedicine in 2022: Riding the Wave in the Right Direction

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Published Online: January 22 2022

The past 2 years at *BIO Integration* have been a delightful journey with our readers and followers. In 2021, the journal published more than 20 peer-reviewed manuscripts and held a series of online academic webinars to expand the influence of integrative biomedicine. In addition, the journal is pleased to now be indexed by Chemical Abstracts Service (CAS) and Directory of Open Access Journals (DOAJ). We are indebted to our prestigious Editorial Board members, the hard-working and dedicated editorial office staff, as well as the reviewers who have tirelessly contributed their time and expertise to the journal over the past 2 years. As we move into 2022, we would like to reflect on past events, while looking forward to gaining new understanding regarding holistic integrative biomedicine and advancing the mission of *BIO Integration* to build a high-quality interdisciplinary forum.

“Holistic integrative biomedicine”: a paradigm shift

Interdisciplinary integration will doubtlessly lead to a future of discovery and innovation, and it is flourishing and advancing at incredible speed. American National Center for Education Statistics at the Department of Education officially revises its list of programs of study for the classification of instructional programs every 10 years. The number of programs in multi/interdisciplinary studies grew from 24 in the year 2000 to 66 in the year 2020. By the end of 2021, according to *Science*'s “Breakthrough of the Year,” more than half of all studies were in the domain of integrative biomedicine [1]. Similarly, *BIO Integration*'s authors have focused on hotspots in science research, including CRISPR/Cas-based gene editing techniques, and COVID-19 vaccine research and development [2, 3].

The concept of integrative medicine/biomedicine should not be confused with alternative medicine or complementary medicine. As described in our first opinion piece, *BIO Integration* is clear on this distinction, and defines integrative research as the application of interdisciplinary integration in academic research [4]. We have gained a more comprehensive understanding of holistic integrative biomedicine, a target-oriented medicine and science considering all interdisciplinary and societal aspects, and often involving multi-disciplinary teams (Figure 1). All influencing factors are considered, including technology, diseases, nature, mind,

spirit, governments and community. Holistic integrative biomedicine is informative, evidence based, inquiry driven and open to new paradigms.

Plausible actions to limit “runaway reactions”

As interdisciplinary studies become more popular, a fundamental concern is whether the quality of research might be sacrificed [5]. The world's scientific and technological powers are taking action to ensure proper implementation of holistic integrative medicine/biomedicine from every aspect (e.g., systems, laws, organizations and policies). For instance, in 2018, the Ministry of Education and the Ministry of Science and Technology in China first proposed the concept of “new medicine,” which supports innovative, scientific, integrative and international new medical education and science.

Precautionary steps are already in place as organizations have detected potential problems early in the process. Extensive efforts have been made worldwide to contain “runaway reactions” to integrative medicine/biomedicine. For example, artificial intelligence (AI) is a typical integrative biomedicine-related discipline. The World Health Organization released their first guidance on AI in 2021, after 2 years of consultations with a panel of international experts [6]. The new guidance, Ethics & Governance of Artificial Intelligence for Health, argues that ethics and human rights must be at the heart of AI's design, deployment and use, if the technology is to improve healthcare delivery worldwide. To date, many clinical trial protocols for interventions involving AI are also available for researchers, institutions and companies focusing on AI studies [7].

As we write this editorial, the world is facing a new wave of the COVID-19 pandemic due to the rapid spread of the Omicron variant. If the bottleneck in the development of holistic integrative biomedicine or the prevention and control of the epidemic cannot be solved, we might currently be in the proverbial best and worst of times. Although the road ahead may be rough, we can see a glimmer of light.

BIO Integration welcomes every submission and suggestion to help improve our principles and practices, and we are grateful for the opportunity to contribute. We envision

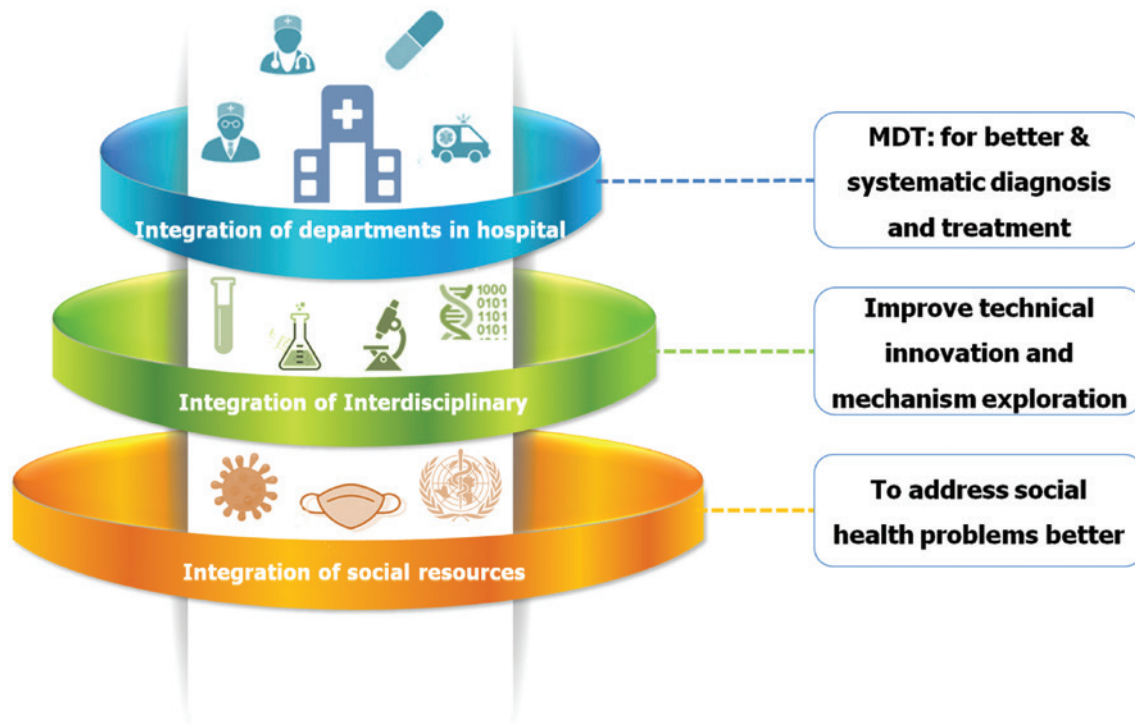


Figure 1 Aims of integrative biomedicine in hospitals, interdisciplinary research and society.

BIO Integration as a pioneer in the effective translation of biomedical research into clinical practice through transdisciplinary communication among experimental scientists, research-active clinicians, industry and healthcare providers.

We hope to have a leading role in advancing holistic integrative biomedicine. To achieve this, we will need your help as readers, authors, editors and reviewers. We invite you to grow with *BIO Integration* in the coming year.

References

- [1] Science's 2021 Breakthrough of the Year: AI brings protein structures to all. Available from: <https://www.science.org/content/article/breakthrough-2021>. [DOI: 10.1126/science.acx9810]
- [2] Saw PE. Voice Series COVID-19 Special Collection Part 2: interview with Arcturus Therapeutics. *BIO Integration* 2021;2:88-9. [DOI: 10.15212/bioi-2021-0009]
- [3] Qiu M, Li P. CRISPR/Cas-based diagnostics and gene therapy. *BIO Integration* 2021;2:121-9. [DOI: 10.15212/bioi-2020-0048]
- [4] Saw PE, Jiang S. The significance of interdisciplinary integration in academic research and application. *BIO Integration* 2020;1:2-5. [DOI: 10.15212/bioi-2020-0005]
- [5] Kleinberg E. Interdisciplinary studies at a crossroads. Association of American Colleges and Universities; 2008. Available from: <https://files.eric.ed.gov/fulltext/EJ790435.pdf>.
- [6] Ethics and governance of artificial intelligence for health: WHO guidance. Geneva: World Health Organization; 2021.
- [7] Rivera SC, Liu X, Chan AW, Denniston AK, Calvert MJ; SPIRIT-AI and CONSORT-AI Working Group. Guidelines for clinical trial protocols for interventions involving artificial intelligence: the SPIRIT-AI Extension. *Br Med J* 2020;370:m3210. [DOI: 10.1136/bmj.m3210]