Preface

IN 2023, THE AABB GLOBAL TRANSFUSION FORUM PUBLISHED A seminal book on *Global Perspectives and Practices in Transfusion Medicine*. That book was unique in focusing almost exclusively on transfusion in low- and middle-income countries (LMICs) and in having more than 80% of the authors derive from these countries. This approach ensured that the knowledge communicated was contextually relevant and accurate. Chapters also combined authors from different global regions so as to present comparisons and contrasts from different parts of the world. Moreover, the book presented not just "perspectives" but also "practices" so that readers could learn about practice differences in different global regions.

Although that book included chapters on global transfusion education, it became apparent that we needed to address this topic more comprehensively across the spectrum of education, training, and staffing and to include not only LMICs but also high-income countries (HICs) for contrasts and comparisons specifically with regard to practice differences and disparities in different global regions. The second book therefore focused on, as titled, *Global Education, Training, and Staffing in Transfusion Medicine*. Even then, it became clear that critical topics had not been addressed, which led to the genesis of the current book, *Global Transfusion Education: Informatics, Biotherapies, Research, and Ethics.*

Informatics has rapidly moved center stage to serve the interests of safe and effective transfusion practice. Although transfusionists have previously tended to learn informatics "by osmosis," through reading, talks, and conferences, we now need more deliberate and systematic approaches for both trainees and faculty. This book aims to lay foundations for such a systematic approach. Informatics covers a broad range of concepts and definitions. This book focuses more specifically on activities associated with data capture and electronic or digital systems used for the purpose of measuring and creating information. The goal is to aid the reader in understanding

trusted data sources and the importance of stewardship of data. The informatics of generative artificial intelligence (AI) has been enabled by large datasets and allows for deep learning algorithms to create new content. But this approach also poses problems that require caution. AI is only as good as the datasets it has access to and how effectively its algorithms learn from those data. Although generative AI holds great promise, it is also fraught with biases that transfusion medicine should be aware of as it ventures into these domains.

Similarly, whereas biotherapies have developed at a brisk pace alongside transfusion medicine, formal education and training programs remain sparse and often insufficiently developed. Many biotherapies practitioners have gained their knowledge through self-directed learning and attending conferences and workshops. The AABB's recent Certified Advanced Biotherapies Professional (CABP) credentialing program is the first and only certification for biotherapies professionals. However, rather than offering formal course work, it mostly provides resources for passing the certification exam. The biotherapies chapters of this book aim to provide guidance in how to further develop education and training in biotherapies. Two chapters also focus on the critical domains of regulation, governance, and oversight for the practice of biotherapies in different global regions.

Although some argue that biotherapies is a discipline distinct from transfusion medicine, increasingly transfusion practitioners are being asked oversee biotherapy laboratories and clinics. What are the specific skills and knowledge domains required of transfusion medicine academics, trainees, and staffers working in biotherapies? What are the education and training intersections between transfusion medicine and biotherapies? Two chapters explore this theme. The term *biotherapies* should be distinguished from *hemotherapies*: the latter term refers to therapies associated with the use of blood and blood products, whereas biotherapies encompasses the use of living cells and tissues. More recently, biotherapies has also come to include gene therapies to treat disease, such as the application of chimeric antigen receptor (CAR) T-cell therapy, which genetically modifies T cells to target cancer cells. A shortage of qualified health-care professionals and skilled medical laboratory staff proficient in meeting the requirements of the operating facilities and manufacturing compliance remains a significant obstacle in the global adoption of biotherapies.

This book examines the educational shortcomings and disparities in LMICs that are due to factors such as resource and infrastructure limitations, lack of regulations, and lack of expertise that result in unequal access to therapies. These are also ethical issues, which is why approaches to ethics education are included in this book. These disparities are exacer-

bated by the lack of biotherapies and informatics education in medical school and postgraduate clinical and research training.

Like ethics, closely linked to the topics of informatics and biotherapies is the field of research education. Research is required to advance the fields of informatics and biotherapies. Yet here again, enormous disparities exist in research capacities, capabilities, and funding between HICs and LMICS. The lack of research in transfusion medicine and hematology can lead to suboptimal diagnostic and treatment strategies, which can negatively impact patient outcomes. Informatics and biotherapies have also generated a slew of fresh questions in ethics that calls for a new generation of well-trained ethicists. The final section of the book suggests how these disparities might be ethically addressed in the short and longer terms.

This book is therefore groundbreaking in providing important background to support education, training, and staffing in the rapidly growing fields of informatics and biotherapies—and is even more so by coupling these approaches with the associated fields of research and ethics. Substantive thought and planning have gone into bringing this book to publication, for which I thank all the section editors, authors, and chapter reviewers. I would also like to thank the AABB Press staff and their freelance colleagues for their superb support and committed efforts in making this book a reality. The entire endeavor has been wonderfully collegial at every level.

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