

25th International Conference on Algorithms for Bioinformatics

WABI 2025, August 20–22, 2025, University of Maryland,
College Park, MD, USA

Edited by

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Preface

This volume comprises the proceedings, extended abstracts, and invited talks presented at the 25th International Conference on Algorithms for Bioinformatics (WABI 2025). The 25th iteration of WABI was held at the University of Maryland in College Park, Maryland, USA from August 20th to 22nd, 2025.

These proceedings mark the 25th anniversary of the conference, which was established in 2001. The focus of WABI is, and has been, on the introduction of new algorithms, data structures, and methodological approaches, and their applications to key problems in computational biology. The conference provides a venue for presenting methods that improve the state-of-the-art in tackling well-studied problems and for exploring and investigating exciting new ideas, including significant works-in-progress. Many interesting and innovative computational approaches, that later see large-scale adoption and application, have previously received their introduction at WABI.

WABI 2025 had 40 manuscript submissions (from 48 initial abstract submissions) from which 21 papers were ultimately accepted for inclusion in the proceedings. Management of the submissions and reviews was done using the EasyChair system. The submissions were rigorously reviewed by the expert program committee and their nominated sub-reviewers. Each submission received a minimum of 3, and often 4 reviews, with an average of 3.875 reviews per submission. After the initial review deadline, reviewers entered into a comment period where the submissions were discussed in light of their reviews, with a particular focus on understanding the nature of any substantial discrepancies between evaluations, and with the goal of giving each reviewer the most comprehensive possible perspective of the submissions they were assigned. The range of expertise of the program committee was wide, as were the set of topics of submitted papers and those ultimately accepted for the proceedings, including topics like pangenome indexing, linear space string alignment, sequence sketching, cancer phylogenomics, RNA structure prediction, the representation of atom-to-atom maps and more.

In addition to the proceedings papers, the conference also welcomed two keynote speakers, Ben Langmead and Christina Boucher. Dr. Langmead's keynote, "We are what we index; a primer for the Wheeler Graph era", followed the evolution and development of increasingly generalized variants of the Burrows-Wheeler Transform from its applications to string matching, to its extension to trees and graphs, and through to the formalization of Wheeler Graphs. Dr. Boucher's keynote, "Recursive Parsing and Grammar Compression in the Era of Pangenomics", covered the theory and application of prefix-free parsing (PFP) to applications in genomics sequence representation and indexing, with a particular focus on pangenomics. It also highlighted the development, application, and benefits of recent extensions of this methodology in terms of recursive PFP (RPFP).

As is customary, selected papers from WABI 2025 have been invited for special consideration, in an extended form, in a thematic series in the journal "Algorithms for Molecular Biology" (AMB), published by BioMed Central.

Finally, we would like to thank all of those without whom this conference would not have been possible. We thank the WABI steering committee for their guidance and feedback in organizing and framing this iteration of the conference, and in helping to tackle challenges that arose. We are also deeply grateful to all of the authors who submitted their exciting work to WABI 2025; this research drives innovations in computational biology, and has led to the formation of an enduring community of researchers working in this field. Of course, we

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are also thankful to the outstanding program committee and their nominated sub-reviewers for their substantial efforts in thoroughly reviewing all of the submitted work, and for their diligence in completing their reviews and engaging in fruitful and enlightening discussions that ultimately led to the final selection of the work included in these proceedings. We thank our keynote speakers, Dr. Ben Langmead and Dr. Christina Boucher, for their engaging and enlightening talks. We also extend our gratitude to Dr. Mihai Pop, the local conference chair, for all of his efforts in helping to organize, plan, and prepare the venue for the conference. At last, we would like to thank all of the conference participants, speakers, poster authors, and student volunteers, whose ideas, discussions and engagement define the scientific character of the WABI community.

Previous WABI proceedings appeared in LNCS/LNBI volumes as follows: 2149 (WABI 2001, Aarhus), 2452 (WABI 2002, Rome), 2812 (WABI 2003, Budapest), 3240 (WABI 2004, Bergen), 3692 (WABI 2005, Mallorca), 4175 (WABI 2006, Zurich), 4645 (WABI 2007, Philadelphia), 5251 (WABI 2008, Karlsruhe), 5724 (WABI 2009, Philadelphia), 6293 (WABI 2010, Liverpool), 6833 (WABI 2011, Saarbrücken), 7534 (WABI 2012, Ljubljana), (WABI 2013, Sophia Antipolis), 8701 (WABI 2014, Wrocław), 9289 (WABI 2015, Atlanta), and 9838 (WABI 2016, Aarhus). Beginning in 2017, they appeared in LIPIcs volumes: 88 (WABI 2017, Boston), 113 (WABI 2018, Helsinki), 143 (WABI 2019, Boston), 172 (WABI 2020, held virtually in Pisa), 201 (WABI 2021, held virtually in Chicago), 242 (WABI 2022, Potsdam) and 273 (WABI 2023, Houston), and 312 (WABI 2024, Egham, United Kingdom).

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