

A Concise Introduction to Key Computing Skills for Biologists

While biological data continues to grow exponentially in size and quality, many of today's biologists are not trained adequately in the computing skills necessary for leveraging this information deluge. In *Computing Skills for Biologists*, Stefano Allesina and Madlen Wilmes present a valuable toolbox for the effective analysis of biological data.

Based on the authors' experiences teaching scientific computing at the University of Chicago, this textbook emphasizes the automation of repetitive tasks and the construction of pipelines for data organization, analysis, visualization, and publication. Stressing practice rather than theory, the book's examples and exercises are drawn from actual biological data and solve cogent problems spanning the entire breadth of biological disciplines, including ecology, genetics, microbiology, and molecular biology. Beginners will benefit from the many examples explained step-by-step, while more seasoned researchers will learn how to combine tools to make biological data analysis robust and reproducible. The book uses free software and code that can be run on any platform.

Computing Skills for Biologists is ideal for scientists wanting to improve their technical skills and instructors looking to teach the main computing tools essential for biology research in the twenty-first century.

- Excellent resource for acquiring comprehensive computing skills
- Both novice and experienced scientists will increase efficiency by building automated and reproducible pipelines for biological data analysis
- Code examples based on published data spanning the breadth of biological disciplines
- Detailed solutions provided for exercises in each chapter
- Extensive companion website

Stefano Allesina is a professor in the Department of Ecology and Evolution at the University of Chicago and a deputy editor of *PLoS Computational Biology*.
Madlen Wilmes is a data scientist and web developer.

"This textbook helps advanced undergraduates and graduate students gain familiarity with computational skills that will allow them to do really useful research. The material tackled by the text is challenging, but Allesina and Wilmes have developed an effective way to help students learn. There isn't anything else out there like it and I'm going to definitely adopt it for course use."

—Michael Alfaro, *University of California, Los Angeles*

"I admire this book's depth and breadth of coverage."

—Matthew Gitzendanner,
University of Florida

"*Computing Skills for Biologists* is a valuable gift for students, and if it had been available when I was a student, I know I would have benefited greatly from it. This textbook looks into the craft of computational biology research, showing how it can be conducted with more efficiency and ease."

—Martin Rosvall, *Umeå University*

"Allesina and Wilmes dedicate their book to 'all biologists who thought they couldn't code': we often thought we couldn't for lack of comprehensive resources. *Computing Skills for Biologists* changes this situation and should find a home on every biologist's bookshelf."

—Timothée Poisot,
University of Montreal

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