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## Preface

This book is the result of a long process that began with a series of Latin American Bioinformatics Training Courses for Tropical Disease Research. These courses, sponsored by WHO-TDR, took place in São Paulo, Brazil, in the years 2002, 2003, 2005, and 2006. They were designed as crash courses for biological researchers, trying to cover in 2 weeks enough information to enable biologists to continue their bioinformatics training independently.

During these courses, it became clear that, in spite of the growing number of books in bioinformatics, most of the books covered the issues either at a theoretical level that was too deep for beginners or at a level that was too superficial to convey the complexity of the issues. Additionally, we were not aware of any book that, for each theoretical subject, provided a detailed tutorial of free software that could be used in day-to-day research. Finally, in our experience, most of the researchers in biological subject areas feel intimidated when confronted with bioinformatics programs.

Hernando del Portillo, the initial course coordinator, then had the idea of creating such a book, taking advantage of the great human resources that were involved in the lectures from the various modules of the several WHO-TDR courses held in Brazil and other countries. He was also the person who got the group of editors together. Hernando, unfortunately, was able to be involved in only the first part of the editorial process, having to leave the book project before the last phase of the work. However, his contribution remains in the effort to select the authors, advocating for the case studies part, making the initial evaluations of the chapters, and co-authoring one of the chapters.

All of the editors of this book have extensive experience in both teaching and organizing bioinformatics courses. Arthur Gruber was part of the organizing committee of all the Brazilian courses, co-Primary Investigator (PI) of the last one, and instructor in short-term Bioinformatics courses in Brazil, South Africa, Peru, and Colombia. Alan Durham was part of the organizing committee of the first course in Brazil, co-PI of the second and third courses in Brazil, and PI of the 2006 course in Brazil; he was also part of the organizing committees and teaching staff in short-term courses in Brazil, South Africa, Thailand, and India. Chuong Huynh has been in the coordinating committee for all of the WHO-TDR courses around the world (five in Brazil, four in South Africa, four in India, and seven in Thailand) and also has been an instructor in all of them. Hernando del Portillo was the PI of the first three Brazilian courses. Finally, Alan, Arthur, and Hernando were part of the group that organized in 2002 one of the first PhD Bioinformatics Programs in Brazil.

This book is intended to serve both as a textbook for short bioinformatics courses and as a base for a self-teaching endeavor. It is divided in two parts: A. Bioinformatics Techniques and B. Case Studies. Each chapter of the first part addresses a specific problem in bioinformatics and consists of a theoretical part and of a detailed tutorial with practical applications of that theory using software freely available on the Internet. All of the authors who were selected for this part of the book have extensive experience in teaching Bioinformatics, either at WHO-TDR and other short-term courses, at universities around the world, or at both. In the second part, we

invited renowned researchers to write chapters that represent up-to-date reviews of particular human diseases, including biological aspects and bioinformatics approaches that helped to solve specific problems.

The book is intended to be a continuous project, and we expect it to be regularly expanded and updated in the future. This characteristic and the desire to make the book widely available, particularly to researchers in developing countries, were key points that led to the decision of open web publishing, as opposed to a paper version.

We feel extremely fortunate with our choice of authors and expect this book to be very useful for both teachers and individual researchers. We thank all of the authors for their great work and for maintaining the motivation in spite of the delays during these last 2 years. Finally, we are deeply grateful to Belinda Beck and Laura Dean for their extremely competent and comprehensive editorial work.

March 2008

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