

Preface

This book, *Systems Biology: Philosophical Foundations*, represents the culmination of our studies on a number of philosophical issues related to systems biology we have undertaken in the recent years. In 1999, Hans Westerhoff, Frank Bruggeman, and Fred Boogerd from the Department of Molecular Cell Physiology (Faculty of Earth and Life Sciences, Vrije Universiteit, Amsterdam, The Netherlands) embarked on a project called 'Living reductionism', supported by the Vrije Universiteit through a so-called USF-grant. We gratefully acknowledge the contribution of Willem Drees (Leiden University) in the initial phase of the project.

In the beginning, our department collaborated with the Departments of Artificial Intelligence (Jan Treur) and Theoretical Psychology (Huib Looren-de Jong) of the Vrije Universiteit to study the concept of reductionism and antireductionism in Biology, Computer Science and Theoretical Psychology. This work resulted in a collection of four papers which was jointly published as a symposium section in *Philosophical Psychology* (vol. 14, no. 4, December 2002).

Thereafter, our department set out to focus more specifically on the idea of enriching Systems Biology and Philosophy of Biology by the mutual application of insights of both disciplines. To be able to accomplish this ambitious task, we thought it worthwhile to seek support from philosophers to elaborate on a variety of philosophical issues that naturally surfaced when thinking about the foundations of systems biology and what exactly made it so different from molecular biology. We are very grateful to Robert Richardson (Cincinnati, USA) and Achim Stephan (Osnabrück, Germany) whom we met in 2002, and with whom we started thinking about central philosophical notions in systems biology. We have had many inspiring and fruitful discussions and their contributions and support were essential to arrive at our current ideas on the foundations of systems biology.

In June 2005, our department organized a symposium: *Towards a Philosophy of Systems Biology* together with Jan-Hendrik Hofmeyr (Department of Biochemistry, University of Stellenbosch, South Africa). It was attended by some 120 persons with various scientific backgrounds. Thirteen Systems Biologists and Philosophers (William Bechtel, David Fell, Jan-Hendrik Hofmeyr,

Douglas Kell, Evelyn Fox Keller, Alvaro Moreno, Robert Richardson, Kenneth Schaffner, Robert Shulman, Achim Stephan, Hans Westerhoff, William Wimsatt, and Olaf Wolkenhauer) shed light on themes related to the subject of the symposium. All of them contributed to this book as an author. Werner Callebaut, Ulrich Krohs, and Mukhtar Ullah, who were not present at the symposium, also contributed as authors.

We thank the editors at Elsevier, Joke Zwetsloot and Anne Russum, for their help and support.

"Systems Biology: Philosophical Foundations" is the first book to be published on philosophical foundations of Systems Biology and we are grateful to have had the opportunity to edit and publish this work.

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