Introduction

This chapter contains the nine peer-reviewed contributions of the First International Workshop on Biological Processes & Petri Nets (BioPPN 2010), held as a satellite event of PETRI NETS 2010, in Braga, Portugal, at June 21, 2010. This workshop has been organised as a communication platform for researchers interested in the application of Petri nets in the broad field of integrative biology.

Integrative biology aims at deciphering essential biological processes that are driven by complex mechanisms, involving miscellaneous interacting molecular compounds. In this context, the need for appropriate mathematical and computational modelling tools is widely advocated. Petri nets have proved their usefulness for the modelling, analysis, and simulation of a diversity of biological networks, covering qualitative, stochastic, continuous and hybrid models. The deployment of Petri nets to study biological applications has not only generated original models, but has also motivated fundamental research.

We received two types of contributions: research papers and work-in-progress papers. All have been reviewed by four to five referees coming from or being recommended by the workshop's Program Committee. In summary, the workshop proceedings enclose theoretical contributions as well as biological applications, demonstrating the interdisciplinary nature of the topic.

The workshop was complemented by an invited talk *Why aren't Petri nets widely used in biological research?* given by Jorge Carneiro from Instituto Gulbenkian de Ciência (IGC, Oeiras, Portugal). He argued that software tools for stochastic Petri nets are well-suited for engineering artificial systems, but do not yet offer all the functionalities one would wish to have at hand when modelling a natural biological system. He used two application examples of stochastic Petri nets to illustrate his concerns – modelling somatic recombination of immune receptor genes and ion channel gating in sea urchin spermatozoa.

The workshop gathered about 30 researchers actively working on or merely interested in the application of Petri nets to biological processes. Its main goal was to demonstrate that this field of application raises new challenges and that Petri nets can be highly effective to tackle such challenges. We take the lively discussion throughout the whole day of workshop as proof that this goal had been reached. For more details see the workshop website `http://www-dssz.informatik.tu-cottbus.de/BME/BioPPN2010`.

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