

BIOSIM (LSHB-CT-2004-005137)

<http://biosim.fysik.dtu.dk:8080/biosim/>

BIOSIM: BIOSIMULATION

Network of excellence of the European Union

2004-2009 (5 years)

Budget: 3.1 M€ (global), 240,000 € approx (IFISC)

TEAM

Raúl Toral

Emilio Hernández-García

Manuel Matías

Adrian Murza

Niko Komin

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IFISC





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BioSim is a Network of Excellence established by the European Commission under its 6th Framework Programme. BioSim was initiated on December 1, 2004. The main objective of the Network is to demonstrate how the use of modern simulation technique through a deeper and more qualitative understanding of the underlying biological, pathological and pharmacological processes can lead to a more rational drug development process, improved treatment procedures, and a reduction in the needs for animal experiments (Replacement, Reduction, Refinement).

The purpose of the network is to develop in silico simulation models of cellular, physiological and pharmacological processes to provide a deeper understanding of the biological processes and help the pharmaceutical industry maintain its competitive power.

26 academic, 10 industrial and 4 regulatory partners.

Network: The European Union wants to strength links between participants. Money goes to traveling, schools, postdocs, students, etc.

	<i>Activity area title</i>	<i>Head</i>
1	Regulatory issues, ethics, dialogue with the public etc.	Marival Bermejo and Hanne Gürtler
2	Diabetes	Patrik Rorsman
3	Hypertension and cardiovascular diseases	Denis Noble
4	Mental disorders and neuronal systems	Hans Braun
5	Cancer	Francis Lévi
6	Methodological issues	Jürgen Kurths



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Our role:

Methodological issues:
Stochastic effects
Diversity effects

Organized the first two conferences in Cala Viñas
Contributed papers

- # Tessone, C.J.; Ullner, E.; Zaikin, A.A.; Kurths, J.; Toral, R.. Noise-induced inhibitory suppression of frequency-selective stochastic resonance. *Physical Review E* 74, 046220 (1-9). 2006.
- # Gomes Da Silva, I.; De Monte, S.; d'Ovidio F.; Toral, R.; Mirasso, C.R.. Coherent regimes of mutually coupled Chua's circuits. *Physical Review E* 73, 036203 (1-7). 2006.
- # Tessone, C.J.; Mirasso, C.R.; Toral, R.; Gunton, J.D.. Diversity-induced resonance. *Physical Review Letters* 97, 194101 (1-4). 2006.
- # Tessone, Claudio Juan; Scirè, Alessandro; Toral, Raul; Colet, Pere. Theory of collective firing induced by noise or diversity in excitable media. *Physical Review E* 75, 016203 (1-5). 2007.
- # Raúl Toral, Claudio J. Tessone, João Viana Lopes. Collective effects induced by diversity in extended systems. *European Physical Journal-Special Topics* 143, 59-67. 2007.
- # Tessone, C.J., Zanette, D.H. ; Toral R.. Global firing induced by network disorder in ensembles of active rotators (submitted 2007).
- # Niko Komin , Raúl Toral. Drug absorption through a cell mono layer: A theoretical work on efflux transporters (preprint 2008).