

Editorial CEMRACS 2018

Numerical and mathematical modeling for biological and medical applications: deterministic, probabilistic and statistical description

This special volume gathers research works that have been conducted during the 23rd edition of the summer school CEMRACS, which took place at CIRM (Luminy, France) from July 16th to August 24th, 2018. The topic of this CEMRACS session was Numerical and mathematical modeling for biological and medical applications: deterministic, probabilistic and statistical description. The CEMRACS (Centre d'Eté Mathématique de Recherche Avancée en Calcul Scientifique), initiated by Yvon Maday and Frédéric Coquel in 1996, takes place every summer and consists in two parts: one week of course, and five weeks of intensive research period on projects gathering young and senior researchers.

The CEMRACS'18 has been dedicated to the application of mathematics to natural sciences. For several years, application of mathematics to biology or medicine has become a major field of interest. Important progresses have been made in multiscale and multiphysics modeling, for both theoretical and numerical aspects. These simulations can be viewed as an alternative to *in vivo* or *in vitro* experiments and may be referred to as *in silico* experiments. A major advantage of these *in silico* experiments is that they do not require invasive procedures and can be easily used to elaborate/test different scenarii. This volume of ESAIM:ProcS gathers some contributions on mathematical and numerical models in the biomedical field, which are the result of works conducted during this summer school and which cover a wide variety of problems that may be encountered in natural sciences. More than 130 researchers from all around the world have participated to this event, making CEMRACS'18 edition a great success. More details are available at <http://smai.emath.fr/cemracs/cemracs18/>.

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The organizers: Vincent Calvez, Céline Grandmont, Eva Lochërbach, Clair Poignard, Magali Ribot, Nicolas Vauchelet

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