Biomedical Applications of Mathematics
AA 2014-2015

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Two topics: two papers to read (choose one)

- **Aortic valvular and arterial stenoses**
  Paper to read: *Fuyou Liang, Shu Takagi, Ryutaro Himeno and Hao Liu. Multi-scale modeling of the human cardiovascular system with applications to aortic valvular and arterial stenoses. Med Biol Eng Comput (2009) 47:743755 DOI 10.1007/s11517-009-0449-9*

- **Cerebral venous blood flow and neurodegenerative diseases**
  Paper to read: *Lucas O. Mueller and Eleuterio F. Toro. Enhanced global mathematical model for studying cerebral venous blood flow. Journal of Biomechanics, Volume 47, Issue 13, Pages 3361-3372, October 17, 2014*

Procedure

- I shall first give you a presentation for each of the three chosen topics
- But before that I shall describe the tasks to be performed by you

TASKS: Written report and oral presentation

- Lay out: abstract; introduction; sections for main body of report; conclusions; references
- Maximum number of pages: 15
- Describe the medical condition(s) of interest
- Describe the underlying biology/physics of the medical problem
- Describe the mathematics involved (equations)
- Describe the methods used to solve the equations
- Critically asses the assumptions made in constructing the mathematical model and describe the limitations of the model
- Describe the salient results of the study
- Express your view as to the future direction of research in this area
- Based on the report prepare an oral presentation (no more than 10 minutes) in Italian or English

Submitting your work

- Produce pdf versions of your report and your presentation
- Name report as follows:
  BAMreport2014/15-yoursurname-yourname.pdf
- Name oral presentation as follows:
  BAMpresentation2014/15-yoursurname-yourname.pdf
- Send report and talk to:
  - eleuterio.toro@unitn.it
  - alberto.valli@unitn.it

Evaluation criteria

- Medical/physiological content: 40 %
- Mathematical content: 40 %
- Report presentation: 10 %
- Oral presentation and discussion: % 10