

Special Issue on **Computational and Mathematical Methods in Nuclear Medicine**

CALL FOR PAPERS

Nuclear Medicine is a great user of electronics and informatics. All the data arising from diagnostic devices have to be digitalized and treated before becoming useful for diagnosis as, for example, the images are.

Since its beginning, Nuclear Medicine is addressed in tracing, following and quantitating normal or pathologic body functions. Great efforts in mathematical modelling and treatment of digital data by computer are necessary to achieve or also approximate the above results. Till now, quantitative imaging (QI) is a great challenge though modern technology has allowed several steps ahead, bringing now Nuclear Medicine very close to obtaining QI.

QI, or with less precision the easier-to-obtain semiquantitative imaging, shows diagnostic importance in order to assess a number physiopathologic variables, such as myocardial and cerebral blood flow or tumor response to therapy.

Mathematical models and digital computing are also of tremendous importance in radioisotope therapy, where the nuclear physician has to quantify the districtual absorbed radiation dose. In this case, QI is a prerequisite for assessing the voxel based dosimetry. Dynamic modelling and probabilistic methods are also necessary to assess the voxel based dose. Computer assisted simulation, using probabilistic mathematical methods similar to those used in voxel based dosimetry, is also used to design and build detectors dedicated to Nuclear Medicine.

Reviews as well as original articles can help to refine and advance the use of mathematics and computing in Nuclear Medicine. The Aim of the present issue is to assess the state of the art and the steps ahead by publishing revision papers and research articles on most of the following topics.

Potential topics include but are not limited to the following:

- ▶ Data mining methods in Nuclear Medicine
- ▶ Multivariate analysis in Nuclear Medicine
- ▶ Treatment of diagnostic data and images
- ▶ Quantitative imaging
- ▶ Mathematical models in Nuclear Medicine
- ▶ Radioisotope therapy and internal dosimetry
- ▶ Detectors

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