TOPIM 2011 – THE FIFTH HOT TOPICS IN MOLECULAR IMAGING WINTER CONFERENCE OF THE ESMI

Emerging Imaging methods in Medicine

Dear Participant,

"*The history of the living world is the elaboration of ever more perfect eyes within a cosmos in which there is always more to be seen*". Today, Teilhard de Chardin's prophecy is a truism for biologists' and physicians' ears. Images are so essential to the daily practice of medicine that it is difficult to imagine a blind practitioner; who would recognize a biology lab without a microscope or a screen display? Who remembers what neurology was like before MRI, or cell biology before the invention of the confocal microscope? Imaging fosters new methods at an ever increasing rate and has revolutionized biomedical sciences. Two words typify this revolution: *in vivo*. From high resolution opto-acoustics, low cost portable imaging magnets, intra-operative fluorescence molecular imaging approaches, to the development of hybrid systems such as MR-PET and MR-SPECT, the availability of new techniques, tools and instruments that can image life in real time and non invasively is more abundant than ever before. In parallel the utility and clinical propagation of such new methods go, well beyond their diagnostic utility, into improving surgical outcome, monitoring infection and inflammation and providing a new set of end points for therapeutic decisions. TOPIM 2011 aims in bringing together leaders in emerging imaging developments to present these techniques together with outlooks of their potential in improving the outcome and reducing the cost of healthcare.

The European Society for Molecular Imaging (ESMI) was created to sustain durably the actions initiated by the European Networks of Excellence beyond the end of their funding. ESMI (http://e-smi.eu) was created in July 2005 by prominent European actors from Academia, Biotech and Industry as a non-profit and apolitical society to promote the development of molecular imaging within Europe, fosters co-operation and provide durable integration. ESMI is committed to scientific and technical excellence, to innovation for better healthcare, to promotion of knowledge and to interdisciplinary co-operation.

TOPIM (for "hot TOPics in IMaging") is one of the major actions initiated by the ESMI.. Rather than proposing a catalogue of recent releases attempting to cover all aspects of the burgeoning imaging field, TOPIM concentrates on one aspect at the forefront of the discipline and selects a different "hot topic" every year, chosen according to pertinence and timeliness. The objective is to concentrate on the newest achievements of in vivo imaging research presented by key actors invited together with students. In its unique format, TOPIM fills the gap between classical meetings, open to all but with scarce discussion timeslots, and prospective meetings that concern small circles of experts out of which stem general ideas or recommendations.

TOPIM'07, the first conference of this kind, held February 19-23, 2007, on the hot topic: Imaging in Neuroinflammation was a great success.

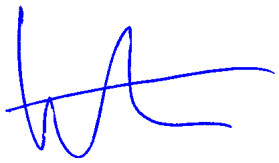
So were **TOPIM'08**: Imaging of nano-objects, held February 4-8, 2008,

TOPIM'09: Dual and Innovative Imaging Modalities (January 26-30, 2009) and

TOPIM'10: "Imaging and Systems Biology" (February 7-12, 2010).

The upcoming session, **TOPIM'11** will launch the debate on **Emerging Imaging Methods in Medicine**.

In the second decade of this millennium, time has come to clarify how and what imaging actually delivers to medicine. What role do images play in diagnosis? What do they tell us about the extension of a cancer or the severity of a neurological syndrome? How do they affect treatment planning? Is imaging capable to assess treatment efficiency? Can one rely on images to establish, modify or adapt the therapeutic strategy? What exactly are those "new eyes" that now guide the hands of surgeons? Can we identify vulnerable atheroma plaques at risk? How are the new imaging contrast agents and tracers contributing to the understanding "*in terms of physics and chemistry,* [of] *those processes by which we live, by which we become ill, by which we are healed and by which we die*" (Claude Bernard 1865)? How far do we stand from the sacred Graal of medicine, the so-called "theragnostics" bridging therapy and diagnostics simultaneously? How can the electromagnetic and mechanical energies forming the basis of image detection be used to selectively attack and destroy lesions while sparing normal surrounding tissues? Will "imagenetics" succeed in using these energies to force expression of specific genes in specifically targeted regions of a living organism? Will medicines find a way to take advantage of the clocks that rhythm our lives? A myriad of questions burn our lips and we want to hear what the specialists that have begun tackling those issues have to tell us.



Bertrand Tavitian on behalf of the
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