

International Conference on

# Nuclear Medicine & Radiation Therapy

July 14-15, 2016 Cologne, Germany

## New Technologies in PET imaging and their applications into the Clinic

**Antonis Kalemis**

Advanced Molecular Imaging, UK

Positron Emission imaging was introduced in the early '50s and after the advent of Positron emission tomography in early '70s a few distinct technological leaps improved the performance of the tomographs and rendered them clinically relevant. A major component that has remained unchanged since its introduction is the photon detection chain based on photomultiplier tubes, rendering nuclear medicine the imaging modality still based, technologically, on vacuum tubes. The recent introduction of solid-state detectors, in this field, allows significant opportunities in the areas of novel imaging modality combinations (e.g. PET/MR) as well as dramatic improvement of image quality and quantification performance. This new generation of hybrid tomographs, in combination with novel highly-specific radiotracers has allowed clinicians to consider PET imaging for new applications or to reconsider its performance in more traditional applications. The proposed talk aims to review the major new (or improved) technologies in PET imaging, such as time-of-flight, solid-state detectors, Anger-logic, iterative reconstruction and corrections and consider the performance benefits that each of them brings. The ultimate aim is to link these technological advancements with expected improvements in clinical performance and provide examples for various different clinical applications.

[antonis.kalemis@philips.com](mailto:antonis.kalemis@philips.com)

## Personalized medicine and quality of life in oncology: Contributions from nuclear medicine

**Masha Maharaj**

Umhlanga Molecular Imaging and Therapy Centre, South Africa

Nuclear Physician Specialist, Umhlanga Molecular Imaging and Therapy Centre Personalized medicine has shifted the paradigm of individualized patient management in evidence-based medicine. In the last 2 decades, advances in targeted radiotherapy have set the stage for a new group of targeting agents with promising performances. Specific imaging probes are the nuclear fuel for molecular imaging by Single Photon Emission Tomography (SPECT) or Positron Emission Tomography (PET). The non-invasive depiction and quantification of biochemical processes with the goal of functional characterization of tumor biology is critical toward the understanding of tumour behaviour. Interpreting and translating these imaging targets into targeting therapeutic agents (Theranostics) is fundamental in selecting alternative therapy options, predicting response in therapy and estimating therapeutic outcome, thus personalizing therapy on a molecular level. There has been increasing weight placed upon quantification of quality of life in the individual. Generally these agents are well tolerated without serious side effects. This has widened the impact and outcome of target radiotherapy and generated the theranostics era.

[drmasha@yahoo.co.uk](mailto:drmasha@yahoo.co.uk)