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Novel Time-of-Flight (TOF) Positron Emission Tomography (PET) Systems Under Development at Stanford

Craig S. Levin, Ph.D.

Professor of Radiology, Physics, Electrical Engineering, and Bioengineering
Molecular Imaging Program at Stanford/Nuclear Medicine
Stanford University,
Stanford, California, USA

Short abstract: We are developing two innovative TOF-PET system designs. The first system is a TOF-PET/CT design that achieves ~100 picoseconds (ps) annihilation photon pair coincidence time resolution (CTR) by employing a novel scintillation detector configuration. The second design is a 'radio-frequency-penetrable' PET insert for simultaneous TOF-PET/MRI that achieves <250 ps CTR, which would be a notable advance for an MR-compatible PET system. If successful, both systems will be translated into clinical studies at Stanford that will investigate benefits of advanced TOF-PET performance in multi-modality imaging studies of cancer, heart disease and neurological disorders.

PARCC
Paris - Centre de Recherche Cardiovasculaire à l'HEGP
Inserm - U970
56 rue Leblanc, 75015 Paris

Standard : +33.1.53.98.80.00
Fax : +33.1.53.98.79.53