



Improving patient outcomes through early diagnosis of atherosclerosis :
 EU-backed SPCCT project to develop new generation of imaging system.

SPCCT, a new medical imaging technology for improved patient outcomes.

€6.4-million, four-year EU-funded SPCCT project to develop and test innovative new clinical imaging system combining spectral photon computed tomography and dedicated contrast agents for improved detection, characterization, and monitoring of cardiovascular disease.

Neurological and cardiovascular diseases represent over 20% of healthcare spending in Europe. Inflammation, a major factor in the outcomes of patients of these diseases, cannot be assessed using the medical imaging tools currently available for the detection of atherosclerosis. A fast imaging method and contrast agent specific to inflammation and microcirculation impairment would give healthcare practitioners valuable information they could use to tailor treatment to individual patients and assess the efficacy of new therapies. SPCCT, or spectral photon counting computed tomography, combined with an energy-resolving detector technology, can provide additional, clinically- relevant information.

The SPCCT project was funded under the European Commission’s Horizon 2020 research and innovation program and is simultaneously focusing on detector technology, data processing, image reconstruction, and new contrast agents. The goal is to deliver a complete clinical SPCCT system that will have broad applications in neurology and cardiovascular disease. The project consortium includes academic institutions, research organizations, and businesses, to ensure fast, efficient transfer of laboratory research results to the market for the benefit of patients everywhere.



SPCCT project well-represented at the 2016 Annual Meeting of the Radiological Society of North America

CT technology was a hot topic at the 2016 Annual Meeting of the Radiological Society of North America held in Chicago on November 27-December 2, 2016. A large number of presentations were dedicated to technological, preclinical, and clinical innovations in CT. Members of the SPCCT project consortium were particularly well-represented and their presentations had a significant impact.

SPCCT project research outcomes were presented by Salim Si-Mohamed, a cardiovascular radiologist at Louis Pradel University Medical Center near Lyon (“*In vivo* quantitative dynamic angiography with gold nanoparticles and spectral photon-counting computed tomography K-edge imaging” and “Determination of biodistribution of gold nanoparticles using spectral photon-counting computed tomography K-edge imaging *in vivo*”), and Daniel Bar-Ness of the Creatis Medical Imaging Research Center in Lyon (“Quantitative multi-contrast agent separation using a spectral photon-counting computed tomography prototype” and “Improving vascular imaging in the presence of metallic stents using spectral photon-counting computed tomography and K-edge imaging”). The SPCCT project consortium is gearing up for RSNA 2017. This year’s theme “Explore. Invent. Transform.” will investigate how innovations in radiology can improve patient care.

Second Spectral CT Workshop to be held in Lyon, France on November 17, 2017

The Second Spectral CT Workshop will be held in Lyon, France on November 17, 2017 to engage physicians and other healthcare professionals from around the globe in a comprehensive exploration of the latest advances in spectral CT imaging.

This international meeting will address the latest advances in dual-energy CT and photon-counting CT research, and provide an update on current methodologies and clinical practice. Participants will also come away with information on the most recent developments in detector technology, CT image reconstruction, and spectral CT contrast media.

Download the full program and registration form here. The deadline to register is October 15, 2017. If you have any questions about your registration, please contact delphine.couturier@chu-lyon.fr

SPCCT could contribute to better colonography.

The article “Spectral Photon-counting CT: Initial Experience with Dual-Contrast Agent K-Edge Colonography” appeared in the journal *Radiology*. The research investigated the feasibility of using SPCCT imaging to differentiate between gadolinium- based and nonionic iodine-based contrast material in a colon phantom, concluding that the method could enable ready differentiation between polyps and tagged fecal material.

SPCCT effective at imaging gold nanoparticle biodistribution.

SPCCT research findings were published in the journal *Nanoscale*. The article “Evaluation of spectral photon counting computed tomography K-edge imaging for determination of gold nanoparticle biodistribution *in vivo*” discusses how SPCCT can provide a repetitive and non-invasive determination of the biodistribution of gold nanoparticles *in vivo*. As gold nanoparticles have many applications in medicine, and, particularly, as adjuvants for radiotherapy and photothermal ablation, the results of this research could open the door to new uses for SPCCT imaging and, ultimately, improve patient care.

SPCCT brings improvements over conventional CT imaging.

The article “Review of an initial experience with an experimental spectral photon-counting computed tomography system” in *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* presents the advantages of SPCCT imaging over CT imaging, which include better sampling of spectral information from the transmitted spectrum for better characterization of tissues and materials of interest, higher spatial resolution, lower radiation exposure, and lower noise.



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