

KEYNOTE TALK

Wednesday, November 19, 2025, at 1:30 pm

Radiomics, Radiogenomics, and AI: The Emerging Role of Imaging Biomarkers in Precision Cancer Care

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Abstract: Cancer risk prediction is increasingly playing a key role in personalized screening and prevention. In addition, cancer is a heterogeneous disease, with known inter-tumor and intra-tumor heterogeneity in solid tumors. Established histopathologic prognostic biomarkers generally acquired from a tumor biopsy may be limited by sampling variation. Radiomics is an emerging field with the potential to provide novel markers of cancer risk, as well as leverage the whole tumor via non-invasive sampling to extract high throughput, quantitative features for the volumetric characterization of tumor heterogeneity. Recent studies have shown that radiomic phenotypes can also augment genetic and genomic assays in precision screening, prognosis, and treatment. Identifying novel computational imaging biomarkers and integrating them with other emerging prognostic and predictive markers with data science approaches and AI to better predict patient outcomes has a potential to ultimately transform precision cancer care.



Speaker Bio-Sketch: Dr. Despina Kontos, Ph.D., is the Herbert and Florence Irving Professor of Radiological Sciences (in Radiology and the Herbert Irving Comprehensive Cancer Center), Vice-Chair of AI, Data Science, and Engineering Research, and founding Director, Center for Innovation in Imaging Biomarkers and Integrated Diagnostics (CIMBID) at the Columbia University Irving Medical Center (CUIMC). She is also the inaugural Chief Research Information (CRIO) officer for CUIMC. Dr. Kontos received her C.Eng. Diploma in Computer Engineering and Informatics from the University of Patras in Greece and her MSc and Ph.D. degrees in Computer Science from Temple University in Philadelphia. She completed her postdoctoral training in radiologic physics and biostatistics at the University of Pennsylvania, and additional postgraduate training in Cancer Molecular Biology and Therapeutics from Harvard Medical School. Dr. Kontos' research

interests lay in the interface of engineering, data science, and medical imaging applications. Most of her research to date has focused on leveraging the role of machine learning and AI in investigating the role of imaging as a predictive biomarker for guiding precision cancer screening, prognosis, and treatment, while integrating with other emerging multi-omic biomarkers, such as molecular profiling, liquid biopsy, and the EHR. She has published more than 100 papers in this field, leading several research studies, funded by the NIH/NCI and private foundations.