



EXPLORER: how Total Body PET can change medicine:

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While Positron emission tomography (PET) is the most sensitive method for non-invasively assaying and imaging biochemical compounds anywhere inside the human body, the fact remains that all PET studies done today are limited by poor signal quality, radiation dose to the subject, or both. Current human PET scanners have an axial field of view that only covers a fraction of the body, allowing the vast majority of emitted PET signal to escape undetected, and severely limiting the possibility of performing dynamic studies that encompass more than one organ at a time.

We have used computer models to show that by extending the axial field of view to encompass the entire body, we can improve the signal for total body applications by a factor of 40, addressing the poor signal problem, while also supporting dynamic studies for all organs simultaneously. We are now embarked on a project, funded by the US National Institutes of Health, to build the world's first prototype whole-body PET scanner, known as EXPLORER. We hypothesize that this new tool could revolutionize the role of molecular imaging in healthcare practice and research.

We will report our progress in developing and testing detector technologies, smaller-scale system prototypes, and a full-size mock-up system for patient handling, as well as our thoughts on the potential applications for total-body PET.