INDUSTRY PARTNERSHIPS TO DEVELOP ADVANCED PET SCANNERS

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Industry-academic partnerships can be critical in moving the field forwards and developing and disseminating next generation imaging technologies. The relationship between UC Davis and United Imaging Healthcare (UIH) is one such example, which has led to two high-profile projects to date, the uEXPLORER total-body PET/CT project and the neuroEXPLORER (NX) project. The goal of this presentation is to briefly review the ingredients for a successful partnership and give an overview of the two projects in which UC Davis plays a leading role.

uEXPLORER PET/CT: This system, the world's first medical imaging device that can capture images from the entire human body simultaneously, was developed under a High-Risk/High-Reward Transformative R01 grant from the NIH in partnership with UIH. The concept and supporting case was developed at UC Davis, with the ultimate realization of the system and its manufacturing taking place at UIH. With its 194 cm long axial field of view, and over 500,000 individual detectors, the uEXPLORER was the most complex PET scanner ever built. The system was installed at UC Davis in 2019, has FDA 510(k) clearance and is in routine clinical and research use. The system has been commercialized and there is an installed base of 13 scanners worldwide.

neuroEXPLORER: Based on the highly successful EXPLORER project, a team that included Yale University, UC Davis and UIH was assembled to develop the world's highest sensitivity brain PET scanner. Major funding was secured from the NIH BRAIN initiative and the system is expected to achieve a spatial resolution < 2 mm and with its high geometric collection efficiency and excellent time-of-flight capabilities, an effective sensitivity ten-fold higher than brain scanners currently in use. The scanner is well on its way to completion (Figure 1). The initial system will be sited at Yale, and the system will be commercialized so that it is available for neuroimaging research across the world.

These two examples show how academic-industry partnerships can successfully design, develop, implement and disseminate new imaging technologies and how UC Davis has played a central role in these activities with respect to advanced PET imaging technology.

Figure 1. Photograph of the high resolution neuroEXPLORER PET scanner currently under construction as part of a NIH BRAIN initiative grant between Yale University, UC Davis and United Imaging Healthcare.