Frequently in university settings, newly designed devices and technologies with potential clinical application reach completion in the absence of sufficient input from clinicians and medical personnel. This results in frustration and lost opportunities for applying advanced technologies to clinical problems. There is a need to create an environment for the effective exchange of knowledge to allow clinical perspectives to drive the design of new devices, therapeutic agents and mathematical predictive models that will solve clinically relevant problems.

Walther Oncology Physical Sciences & Engineering Research Embedding Program

INITIATIVE
This program is a joint effort between Purdue University and the Indiana University Simon Cancer Center (IUSCC). It is part of the Cancer Care Engineering project sponsored by the Oncological Sciences Center in Discovery Park. The program has two goals: (1) support transdisciplinary research involving physical scientists and engineers at Purdue and cancer clinician scientists at IUSCC; and (2) significantly expand the experience and training of new PhDs at Purdue and junior clinician scientists at IUSCC. The program addresses the second goal by simultaneously embedding Purdue science and engineering postdoctoral fellows in the clinics at IUSCC and IUSCC medical fellows in the engineering, chemistry, physics and pharmacy laboratories at Purdue.

Using the synergy between Purdue and IU as a living laboratory, cross-training scientists, engineers and medical fellows has the potential to create a paradigm shift in how we prepare the next generation of clinicians and engineers/scientists. These cross-trained cancer researchers will lead 21st century interdisciplinary research focused on new technologies and devices to promote cancer prevention and advance early detection, diagnosis and effective treatment. This transdisciplinary approach infuses understanding of a clinical perspective early in research development, facilitating the path of translation to the clinic.

IMPACT
Embedding Projects and Quotes from Clinicians and Research Fellows (as of June 2014)

- Nanotechnology (Chemistry, Purdue) + Ovarian Cancer (Hematology/Oncology, IUSCC); “...Very exciting experience!”
- Detection Devices (Mechanical Engineering, Purdue) + Lung/Ovarian Cancer (Hematology/Oncology, IUSCC); “One of the most memorable experiences I ever had...To me research is not only just about publications anymore.”
- Mathematical Modeling (Chemical Engineering, Purdue) + Childhood Acute Lymphoblastic Leukemia (Pediatric Hematology/Oncology, IUSCC); “...very unique and valuable.”, “...really moved our research a significant step forward in the direction of more translational oriented work.”
- Detection Nanotechnology (Medicinal Chemistry, Purdue), Adult Leukemia (Hematology/Oncology, IUSCC); “...a career changing experience...all basic science researchers should spend time in a clinic as part of their training.”, “...the program has given a new perspective to my clinical practice.”

Products of Embedding Projects
$1.5 million over 5 years to support research projects
5 peer-review journal publications, 1 book chapter, and 7 conference presentations
13 grant applications
3 medical fellow promotions at IUSCC
More than $3.6 million awards received

The Walther Oncology Physical Sciences and Engineering Research Embedding Program is funded by the Walther Cancer Foundation in Indianapolis.