

TRANSLATIONAL RESEARCH IN SOLID TUMORS (TRIST) PROGRAM

The Robert H. Lurie Comprehensive Cancer Center of Northwestern University is proudly leading the **Translational Research in Solid Tumors (TRIST) Program** to accelerate high-impact investigations of solid tumors. Marcus Peter, PhD, and William Catalona, MD, co-direct the TRIST Program and are working in concert to coordinate efforts and spark new collaborations among Northwestern University researchers studying solid tumors, including cancers of the skin, liver, pancreas, lung, brain, gut, and prostate.

The TRIST Program is driven by three major goals:

- To study basic mechanisms of cancer development and progression and identify novel targets for therapy;
- To develop preclinical animal models to test novel therapeutics to treat solid cancers; and
- To conduct clinical studies in humans to test and validate novel approaches and technologies for the detection and treatment of solid cancers.

Through this innovative and interactive program, we are bringing together accomplished clinicians and scientists who are spearheading research within the themes of molecular and cell biology, early diagnosis, prognosis, risk factors, and therapeutics, as well as the treatment of cancer of the aerodigestive tract and the treatment of dermatologic, gastrointestinal, genitourinary and neuro-oncologic cancers.

Currently, there are 87 faculty at Northwestern who are members of the TRIST Program. These experts represent 19 departments and three schools across both campuses of Northwestern University. Interactions between investigators are encouraged and facilitated by the TRIST Program—these collaborative activities are synergistic and absolutely essential to translational cancer research that leads to new insights and breakthroughs.

Over the past year, there were 415 cancer-relevant publications from the current TRIST Program members. Over 20 percent, or 87 of these publications, represent intra-programmatic collaborations, and 186 (44.8 percent) of these publications represent inter-programmatic collaborations.

TRIST members have multiple interests that revolve around a number of novel and promising research directions. These include the:

- Study of the function and the therapeutic use of siRNAs and miRNAs (siRNAs are a class of double-stranded RNA molecules, 20-25 base pairs in length, and miRNAs or microRNAs are small non-protein coding genes present in virtually all animals and plants that tend to be transcribed from several different loci in the genome). Both siRNAs and miRNAs act by repressing conventional genes;
- Development of nanoparticles for the delivery of drugs and oligonucleotides to solid cancers (oligonucleotides are short DNA or RNA molecules that have a wide range of applications in genetic testing, research, and forensics);
- Role of cancer stem cells in tumor progression;
- Role of angiogenesis in cancer progression (angiogenesis is a biological process that stimulates the development of new blood vessels and tumor metastases while maintaining existing blood vessels);
- Study of the balance of cell survival and cell death in solid cancers; and
- Study of the tumor microenvironment of solid cancers.

Drs. Peter and Catalona are world-renowned scientists who have distinguished themselves throughout their careers as cancer experts. Through TRIST, they are charting a new path with their Northwestern research colleagues to uncover new knowledge and discoveries that benefit patients with solid tumors across a broad range of cancers.

TRIST Program Leadership



Marcus Peter, PhD
TRIST Program Leader and Professor of Medicine, Biochemistry and Molecular Genetics

Dr. Marcus Peter has been working in the apoptosis and death receptor field for 23 years. Apoptosis is the death of cells

that occurs as a normal and controlled part of an organism's growth or development.

His initial work in 1995 described the first multiprotein complex in apoptosis, the CD95/Fas death-inducing signaling complex (DISC). This was followed in 1996 by the cloning of the key component of the DISC, caspase-8. Over the years Dr. Peter's group has described the apoptotic signaling pathway of CD95 in detail. After his relocation to the United States in 1999, he turned to novel nonapoptotic activities of CD95, which his group recently reported to be highly relevant for cancer cells. Outside the death receptor field, Dr. Peter has made a number of seminal discoveries in the area of miRNAs and cancer. The Peter laboratory discovered that the miRNA family let-7 families is a major regulator of tumor progression. Subsequently, the group demonstrated that miR-200 is a marker and a powerful regulator of the epithelial-mesenchymal transition (EMT), a process relevant for tumor progression and metastasis. The goals of the current research conducted in Dr. Peter's laboratory are:

- 1) To study the tumorigenic activities and signaling pathways of the death receptor CD95, and 2) To study the role of miRNAs in tumor progression.



William Catalona, MD
TRIST Program Interim Co-Leader and Professor of Urology

Dr. William Catalona is professor of urology, director of the Prostate Cancer Research Program of the Lurie Cancer Center, principal investigator (PI)

of the Prostate SPORE grant, co-chair of the SPORE Genetics Working Group, and PI for the Northwestern branch of the International Consortium for Prostate Cancer Genetics. Dr. Catalona has a strong track record of productive research in prostate cancer in the areas of tumor markers and prostate cancer genetics. He was the first to show that the PSA (Prostate Specific Antigen) blood test could be used as a first-line screening test for prostate cancer. He directed a PSA-based screening study, involving more than 36,000 men and lasting 12 years, which helped to characterize the operating characteristics of the test. Dr. Catalona is currently conducting research into biomarkers of prostate cancer and the genetics of prostate cancer, which could lead to new tests for the disease as well as possible new means of treating or preventing prostate cancer. He specializes in prostate cancer surgery and is recognized as an expert in performing the 'nerve-sparing' radical prostatectomy that can preserve sexual potency.

A Call for Partnership

Philanthropic support is vital to sustain our efforts in translational cancer research. Through donor generosity, we will be able to provide dedicated research support to basic science and clinical investigators to team up on translational (bench-to-clinic) research projects in the area of solid tumor cancers.

"Through the TRIST Program, we are bringing top Northwestern clinicians and scientists together to work collaboratively, and thereby, accelerate the progress and impact of our translational research on solid tumors."

Marcus Peter, PhD, TRIST Program Leader and Professor of Medicine, Division of Hematology/Oncology