The Biodesign Institute at Arizona State University: Five hundred researchers pursuing solutions to life’s problems through the physical and life sciences; questioning and learning — and growing our next generation of explorers and discoverers.

The success of our work relies in part on support and investments from like-minded organizations and individuals. Join us as we work to improve health, protect lives and sustain our planet.

For more information on Biodesign, to arrange a tour or find out how you can get involved, visit biodesign.asu.edu

how do we... find answers faster for cancer?

Audacious new approaches to combating the killer
Can ‘open science’ accelerate cures?

Joshua LaBaer, MD, PhD

LaBaer leads a multidisciplinary team at the Virginia G. Piper Center for Personalized Diagnostics in a large-scale effort to discover and validate unique molecular fingerprints of disease. These fingerprints, called biomarkers, can provide an early warning for those at risk of major illnesses. LaBaer is co-inventor of a technology that serves as the molecular toolkit for his approach.

LaBaer believes that these biomarkers will lead to blood tests for the early detection of breast cancer, potentially catching breast cancer earlier and saving thousands of lives each year.

Can our immune system give us an earlier warning?

Karen Anderson, MD, PhD

At Biodesign’s Virginia G. Piper Center for Personalized Diagnostics, oncologist and researcher Karen Anderson is looking for ways to diagnose cancer quickly, easily and with less cost.

Her focus is on combing the immune system for early warning beacons of cancer, known as biomarkers. Leveraging the body’s immune system to target and fight cancer — a strategy known as immunotherapy — holds enormous promise for treating many cancers. But, real advances in immunotherapy are currently limited by the mysteries of immune system regulation and how promote effective immune responses.

Anderson’s group of researchers already has identified novel biomarkers for the detection of breast, ovarian and human papillomavirus (HPV)-associated cancers. Her focus on investigating how tumors develop aims to identify clinical targets for cancer therapeutics and immunotherapy for solid tumors. In partnership with Mayo Clinic Arizona, Anderson is studying cells derived from patients undergoing surgery for breast and ovarian cancer.

In addition, Anderson’s work has been pivotal in the launch of the new International School of Biomedical Diagnostics – an ASU partnership with Dublin City University. Through this work, Anderson and her colleagues are building on recent advances in areas such as nanotechnology and DNA sequencing to develop cancer treatments that can be more precise, more personalized and tailored to the individual patient. Each year, billions of dollars are spent on drugs and therapies that only work for a few patients, some of the time. Anderson’s work aims to change that.

With Dublin City researcher Jens Durzel, Anderson is helping develop a “lab-on-a-disk,” a point-of-care device that has the potential to detect cancer earlier, faster and for a fraction of the cost.

Is it possible that a vaccine could eradicate cancer?

Stephen Albert Johnston, PhD

Many once-lethal infectious diseases have been brought under control, in some cases, eradicated from the earth through one of the most successful weapons in the arsenal of medicine: vaccines.

Could cancer one day go the way of polio? Could a vaccine be devised that would protect the population from this relentless killer? Stephen Johnston, co-director of Biodesign’s Center for Innovations in Medicine, believes the answer is yes.

Johnston’s path-breaking efforts, many carried out in collaboration with Mayo Clinic Arizona, are aimed at identifying specific protein components absent in healthy cells but present in cancerous tumors. These aberrant proteins may provide attractive targets for vaccination. If the immune systems of healthy individuals can be primed to recognize and respond to these aberrant, cancer-linked proteins, they may be able to defeat the disease in a future encounter.

It’s believed that a number of these telltale proteins are shared among a variety of different cancer types, opening the possibility of cross-protecting against several cancers with a single vaccine.

Can a pill as simple as aspirin prevent colon cancer?

Raymond DuBois, MD, PhD

Inflammation is the body’s first defense against infection, but when it goes awry, it can lead to colon cancer, Alzheimer’s disease, heart attacks and a host of other diseases. For most of his career, researcher and internist-gastroenterologist Raymond DuBois has pursued the question of the intricate interplay between inflammation and cancer.

According to DuBois, the simple anti-inflammatory – aspirin – is at the heart of the chemoprevention research that is exploring the body’s detailed inflammatory circuitry.

DuBois and his colleagues are looking into the potential of developing new strategies for cancer’s early diagnosis, treatment and perhaps one day, prevention.