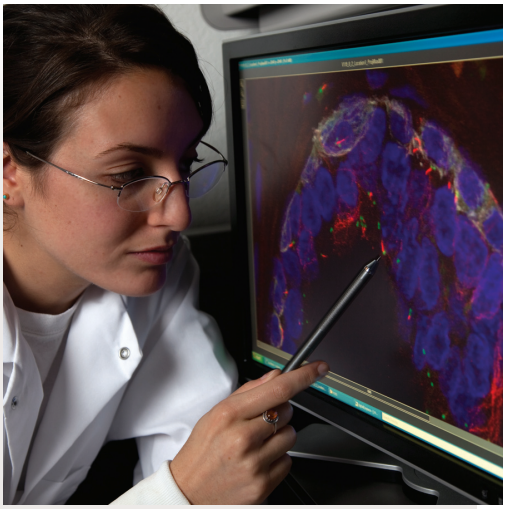
Cancer Biology



The Cancer Biology Program serves as the primary basic science arm of the University of Arizona Cancer Center. The research done in the Cancer Biology Program has one primary focus: to discover and understand how cancer works at the most fundamental levels–how normal cells turn malignant or how tumor cells grow and spread–in order to put a stop to it.

Understanding the biological mechanisms that govern normal and abnormal cellular processes allows our researchers to search for new tests for early detection, better diagnostic methods using biological markers and more effective, less toxic treatment and prevention strategies.

The Cancer Biology Program approaches discovery through disease-focused areas—such as the breast, ovary and prostate—in order to study the different ways cancer can develop and spread throughout the body.

Researchers also focus on cutting-edge studies to get us closer to the future of healthcare–personalized medicine–by identifying specific molecular and genetic targets. Cancer Biology Program members look for opportunities to translate laboratory discoveries into real-world strategies for cancer prevention and treatment through clinical trials.

HIGHLIGHTS

REGULATING CHROMOSOMES AT CELL DIVISION

Cancer Center researcher Gregory Rogers, PhD, is studying how chromosomes are faithfully distributed to daughter cells during cell division. An organelle critical to this process is the centrosome. The centrosome organizes a mechanical structure that separates the chromosomes. Dr. Rogers has shown that the kinase PLK4 is a critical regulator of centromsome function. PLK4 is down-regulated in many cancers, including breast and prostate cancer, and its down-regulation could be a factor in unfaithful chromosome segregation in many cancers.

PREVENTING BONE LOSS AND PAIN

Department of Pharmacology Chairman Todd Vanderah, PhD, and his Cancer Center colleagues Patrick Mantyh, PhD, JD, and Frank Porreca, PhD, have recently demonstrated the efficacy of non-psychotropic cannabinoid 2 (CB2) receptor agonists in controlling bone remodeling by metastatic breast cancer cells in a rat model. The CB2 agonist inhibits the advance of cancer cells preventing bone loss and bone pain. The drug will be tested in pre-clinical models prior to initiation of a phase 1/2 clinical trial.

UNDERSTANDING COLORECTAL CANCER

Recently recruited Cancer Biology Program Director Nathan Ellis, PhD, studies the molecular underpinnings of colorectal cancer. His studies have uncovered mutational mechanisms in cancer development that explain the excess right-sided colorectal cancer in African Americans. He is investigating interactions between dietary factors, bacterial components, regulation of bile acids, and their roles in cancer development and cancer health disparities.