# clinical studies

solid tumor

## Umbrella Protocol for Artidis Nanomechanical Generated Measurements in Solid Tumors

**SITE ENROLLING**

Houston, Texas, USA

Leading Center: **MD Anderson Cancer Center**

artidis

Timely Diagnosis | Optimized Therapy

## Our Technology

The Artidis platform, using Indentation-Type Atomic Force Microscopy (AFM), is the first device to analyze the nanomechanical properties of fresh tumor tissue directly from patients. This research explores whether nanomechanical phenotyping may assist in characterising tissue properties and investigating correlations with clinical parameters.

## Clinical Relevance

Diagnosing and treating solid tumors is complex and often delayed, increasing patient anxiety and disease progression risk. Conventional treatments like chemotherapy and radiotherapy have limited success and high relapse rates. Though targeted and immune therapies improve outcomes for some, their restricted use and emerging resistance highlight the need for better tools to understand tumor biology and personalize care.

## Primary Objective

1. Obtain nanomechanical signatures of cancer

## Secondary Objective

1. Correlate nanomechanical signatures with pathological characteristics of cancer.
2. Associate nanomechanical signatures with disease outcomes and treatment response

### Breast

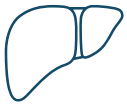
**Inflamatory breast cancer (IBC)**, is a rare but highly aggressive subtype that accounts for only 2–3% of all breast cancer cases yet contributes to up to 10% of breast cancer–related deaths. IBC is frequently diagnosed at Stage III or IV and remains challenging to manage, with national guideline–concordant care delivered in only about 25% of cases. In this pilot, we are assessing the nanomechanical properties of IBC tissue to help guide treatment optimization and improve clinical decision-making.

Principal Investigator:
**Wendy Woodward**, MD, PhD

### Pancreas

**Pancreatic ductal adenocarcinoma (PDAC)** is an aggressive malignancy with poor prognosis and limited treatment options. Despite advances in surgery, chemotherapy, and targeted therapies, recurrence and resistance to treatment remain major challenges. This pilot study aims to investigate the nanomechanical properties of pancreatic cancer with the goal of identifying nanomechanical signatures that could serve as biomarkers to optimize therapeutic strategies and improve patient outcomes.

Principal Investigator:
**Eugene Koay**, MD, PhD



### Liver

**Liver cancers**, including hepatocellular carcinoma (HCC) and cholangiocarcinoma, represent a group of malignancies associated with high morbidity and mortality. Despite advances in systemic and locoregional therapies, recurrence and therapeutic resistance continue to limit long- term success. This pilot study aims to explore the nanomechanical diversity of liver tumors to uncover biomechanical patterns that may inform personalized treatment strategies and advance understanding of tumor progression dynamics.

Principal Investigator:
**Eugene Koay**, MD, PhD

### Sarcoma

**Chondrosarcoma, chordoma, and osteosarcoma** which are rare bone tumors with distinct clinical profiles. Despite advances in treatment approaches, recurrence and resistance to treatment remain a major challenge. This aims to investigate the heterogeneity of the nanomechanical properties of these sarcomas with the goal of using the nanomechanical signature as a biomarker to optimize therapy approaches and improve treatment response.

Principal Investigator:
**Justin Bird**, MD

### Lung

**Metastatic lung cancer** remains a leading cause of cancer-related mortality, characterized by high heterogeneity and limited long-term response to systemic therapy. While immunotherapy and targeted treatments have improved survival in selected patients, resistance and disease progression remain major challenges. This pilot study aims to evaluate the impact of Radscopal therapy on the tumor microenvironment and its potential to enhance systemic immune responses. By integrating nanomechanical profiling with radiotherapeutic modulation, the study seeks to reveal mechanobiological signatures that may predict treatment sensitivity and inform combination therapy strategies.

Principal Investigator:
**James Welsh**, MD

### Bladder

**Low-grade non–muscle-invasive bladder cancer** has a favorable prognosis, but high-grade tumors remain difficult to manage and often require removal of the bladder. Despite effective initial treatment, non–muscle-invasive bladder cancer is associated with high recurrence rates and a risk of progression to muscle-invasive disease, highlighting the need to investigate the biological mechanisms driving tumor persistence and progression. This pilot aims to better understand the unique biological and microenvironmental factors driving this disease.

Principal Investigator:
**Donna Hansel**, MD, PhD

For any questions about this study or to express your interes in participating, please reach out to our research team at:

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