The Felding Lab at The Scripps Research Institute

**Research Mission:** To understand mechanisms of cancer spreading and develop effective therapies to prevent and inhibit this process

The main problem in cancer is its ability to spread from a primary tumor to distant organs. This process is called **METASTASIS**. It is the main cause of death in cancer patients.

**Our Goal:**
To develop treatments to prevent breast cancer spreading and to allow women with metastatic breast cancer to live a normal life and to control the cancer permanently with minimal or no side effects.

**Our Strategy:**
Identify causes of cancer cell spreading and find out what the cells need to survive and **GROW** at their target sites.

**New Discovery:** Defects in energy metabolism of breast cancer cells drive their growth in the breast and at distant sites. **Normalizing the energy pathway slows primary tumor development and stops metastatic growth in distant organs.** This is a new strategy for effective therapy.
Which metabolic defect can cause breast cancer aggressiveness?

- We found a specific defect in tumor cell mitochondria, the powerhouses of the cell
- This defect impairs cellular respiration
- And disturbs the cellular redox balance
- As a result, the cells grow faster, become more invasive, and cause metastasis

How does Normalization of Breast Cancer Cell Metabolism work?

- The mitochondrial defect disturbs the NAD⁺/NADH redox balance
- NAD⁺ precursor treatment restores a normal balance

New Discovery: Normalization of energy metabolism halts breast cancer progression
And strongly reduces the incidence of metastasis
This strategy is a promising new approach for prevention and therapy of breast cancer development and spreading.