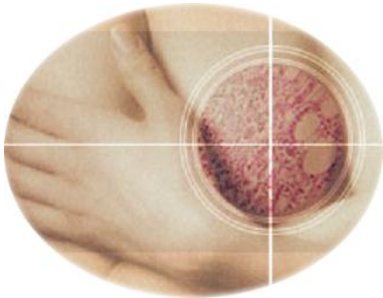


# The Felding Lab at The Scripps Research Institute

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

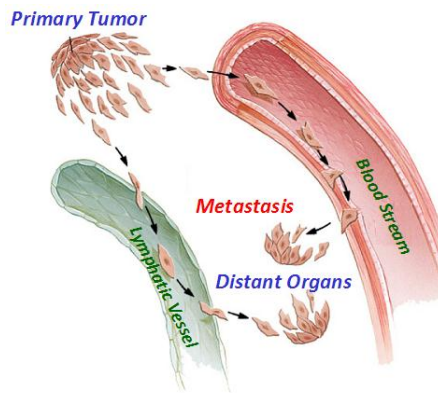
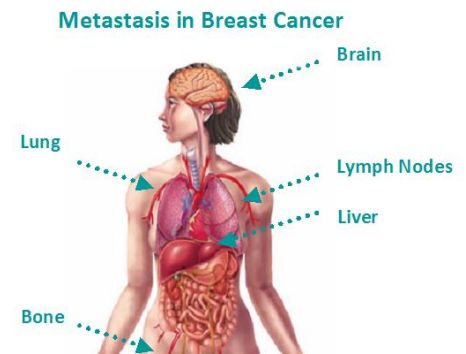


The main problem in cancer is its ability to spread from a primary tumor to distant organs. This process is called **METASTASIS**. It is the main cause of death in cancer patients.

## 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

Breast cancer can spread to the Lungs, Liver, Lymph Nodes, Bone, and Brain

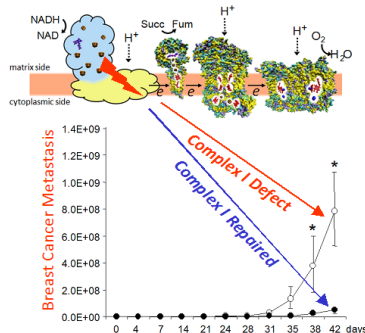


Metastasis occurs when cancer cells from a primary tumor enter the lymphatic system or the blood stream and colonize distant target organs

## Our Strategy:

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

**Mitochondria**  
Repairing the Respiratory Chain blocks Metastasis

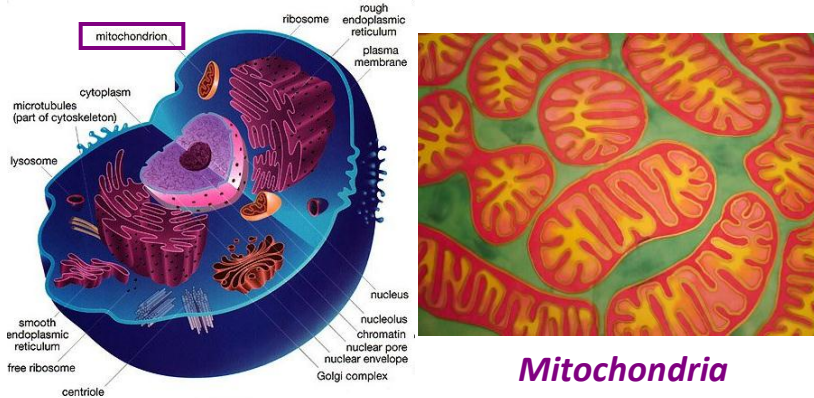


**New Discovery:** Defects in energy metabolism of breast cancer cells drive their growth in the breast and at distant sites. *Normalizing the energy pathway slows primary tumor development and stops metastatic growth in distant organs.*

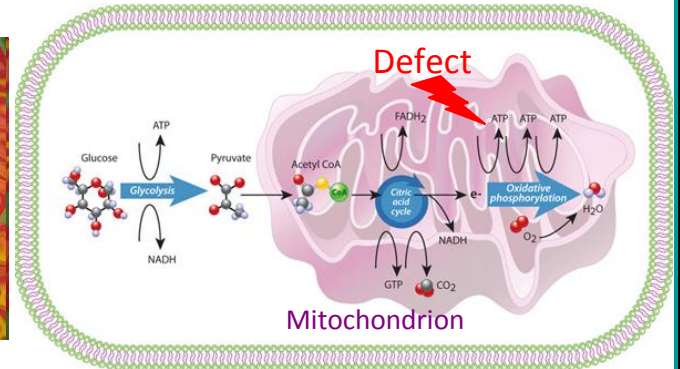
**This is a new strategy for effective therapy**

## Which metabolic defect can cause breast cancer aggressiveness?

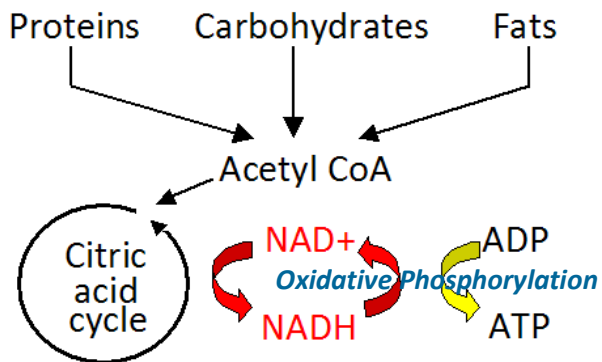
- We found a specific defect in tumor cell mitochondria, the powerhouses of the cell
- This defect impairs cellular respiration
- And disturbs the cellular redox balance
- As a result, the cells grow faster, become more invasive, and cause metastasis



Mitochondria



## How does Normalization of Breast Cancer Cell Metabolism work?



- The mitochondrial defect disturbs the NAD<sup>+</sup>/NADH redox balance
- NAD<sup>+</sup> 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.**

Primary Tumor

Brain Metastases

