

Big Idea: A Fearless Campaign to Address the Grand Challenge of Primary Cancer Prevention

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Description of the Initiative

There is an impending chronic disease crisis in our country and it is predicted that if the current trends continue, the number of cancer cases diagnosed annually by 2050 is likely to double as a result of population aging. Therefore, if the healthcare community hopes to head off the coming storm, we need to increasingly emphasize **primary cancer prevention** research and training.

“**Dietary bioactives**” represent a class of constituents in foods or dietary supplements, other than those needed to meet basic human nutritional needs, which are major contributors to changes in health status. With respect to all human malignancies, **35%** are linked directly to **diet** and an additional **14-20%** to **obesity**. Consistent with these data, cancer risk can be lowered by **36%** when humans adhere to healthy dietary principles, namely, high intake of fruits, vegetables, and whole grains and low meat consumption. Therefore, establishing a causal role for cancer **dietary prevention** approaches with minimal safety problems intrinsic to drugs administered over long periods of time would have a major translational impact in cancer prevention and patient survivorship.

The link between **diet, the microbiome** and **cancer risk** is receiving growing attention. Recent evidence indicates that the combination of Western diet, obesity and physical inactivity can be considered to be a toxic triad promoting cancer incidence and mortality. However, even though there are many observational/epidemiological studies linking diet, the microbiome and cancer risk, the association cannot be easily explained mechanistically.

Establishing a causal role for **diet/lifestyle in primary cancer prevention** would have a major translational impact in cancer prevention and patient survivorship. Therefore, our **goal** is to train the next generation of scientists with the appropriate skill sets to elucidate the molecular mechanisms modulating cell responses to exogenous (diet-derived bioactive molecules), and endogenous (gut microbial) derived bioactive agents to reduce cancer risk.

Overall Goal

Our goal is to coalesce an interdisciplinary group of faculty, post docs and students working to reduce cancer prevalence into an integrated team for the purpose of developing extramurally funded research projects and a graduate training program in **Primary Cancer Prevention**. This goal is well aligned with the COALS **Improving Our Health** Grand Challenge under the topic of **Foods for Health and Prevention of Disease**.