

Prostate cancer is a significant global health issue, with millions of men affected worldwide. As obesity rates continue to rise globally, with nearly 40% of adults now classified as obese, the link between obesity and an increased risk of cancer has become clearer. However, there is still much to learn about how diet and nutrition impact the effectiveness of cancer treatments, particularly in prostate cancer.

Recent research suggests a potential link between certain dietary components, specifically carbohydrate-derived metabolites like advanced glycation end-products (AGEs), and the progression of prostate cancer. AGEs, which are common in many diets around the world, may contribute to the transformation of prostate cancer cells into more aggressive forms that are resistant to standard treatments such as androgen deprivation therapy (ADT). This resistance can lead to metastatic castration-resistant prostate cancer (CRPC), a condition that is notoriously difficult to treat.

Our interdisciplinary team, consisting of bioengineers, cancer researchers, and physicians, is dedicated to understanding how dietary modifications can enhance the effectiveness of conventional cancer therapies. We are employing advanced imaging techniques (such as PET-CT and flowmetry) and molecular biology methods to explore the impact of diet on the AGE/RAGE pathway, which is implicated in the neuroendocrine differentiation of prostate cancer.

While our primary focus is on prostate cancer, the insights gained from this research have the potential to be applied to other types of cancer and related diseases. Nutritional interventions, particularly the reduction of AGEs through dietary changes, are emerging as promising strategies for managing a range of conditions. Although these dietary modifications have shown benefits in improving insulin sensitivity, reducing abdominal obesity, and decreasing oxidative stress, their impact on cancer therapy efficacy remains largely unexplored.

The outcomes of our research could revolutionize the management of prostate cancer by providing new evidence on the importance of diet in cancer treatment. We anticipate that our findings will prompt further studies and potentially lead to new guidelines for integrating nutritional strategies into standard cancer care.

In collaboration with the Medical University of Gdansk, the Technical University of Gdansk, the University of Illinois Cancer Center, and the Cancer Research Advocacy Group (CRAG), we are committed to translating our preclinical findings into clinical applications. Our goal is to disseminate this knowledge widely, helping to establish best practices for cancer survivors around the world.