

Progress on Prostate Cancer Research

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Advancements in prostate cancer research provide hope for finding a cure and lead to the discovery of new treatments to minimize the impact of a man's prostate cancer and maximize his quality of life. This regular *Hot SHEET* supplement includes some of the latest research from the Prostate Cancer Foundation (www.pcf.org).

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Limiting Prostate Cancer's Fuel

By Janet Farrar Worthington

Just when it seems like the picture of diet and prostate cancer is finally coming into focus, PCF-funded scientist Nicole Simone, M.D., a radiation oncologist at Thomas Jefferson University, has added a new dimension. It may not be just a question of the **good foods you do eat**, and the **bad foods you don't eat**, it also appears to matter, very strongly, **how much you eat at all**.

Simone's research in prostate cancer and also in breast cancer suggests that restricting calories has many anti-cancer effects in the body – including, in mice, decreasing the likelihood of metastasis. It lowers inflammation, changes the gut microbiome, may decrease the side effects of systemic therapy, and generally seems to slow down cancer. In effect, caloric restriction gives cancer a “brown-out,” limiting its energy.

Simone's laboratory has been investigating caloric restriction for several years. In mouse models of hormone-sensitive breast cancer, Simone found that simply restricting the mice's daily caloric intake made a big difference. It not only altered cell metabolism and made cancer cells more vulnerable to radiation and chemotherapy, it also **decreased metastasis** and **increased overall survival**.

“In several models of hormone-sensitive prostate cancer, we found the same,” she says. “We were able to decrease tumor growth, decrease metastasis, and increase survival.” Then Simone's lab tested caloric restriction in mice with castrate-resistant prostate cancer (CRPC), cancer that is no longer controlled by androgen deprivation therapy (ADT). Again, caloric restriction affected how tumors responded to radiation. Simone says, “We wanted to take it a step further, and use that preliminary data as a launching pad to see what would happen in patients with prostate cancer if we put them on a caloric restriction diet.”

Eating 25 percent less: In a pilot study, 20 patients – men diagnosed with localized prostate cancer who were scheduled to have a prostatectomy – underwent caloric restriction for 21 days. Simone individually tailored each man's daily calorie total, based on what he had reported eating for several days ahead of time. “We figured out their average caloric intake and then decreased that by 25 percent.” Simone's team also gave the men some dietary guidelines, encouraging (but not requiring) an anti-inflammatory diet with less refined sugar and processed food, and more fruits, vegetables, and complex carbohydrates. “The men were able to stick to the diets really nicely,” she says. “They did increase their anti-inflammatory foods! They also lost an average of 12 pounds each.”

Could just three weeks of restricted-calorie, anti-inflammatory diet make a difference? Yes, in several ways, including: a decrease in systemic inflammation, changes in the gut microbiome, less inflammation in the gut wall, and less inflammation in the tumor.

Ultimately, Simone believes, caloric restriction can play an important role for men in all stages of prostate cancer – but to make it even more effective will also require **precision nutrition**, based on **precision oncology**. “Prostate cancer can metabolize through the glucose pathway, or through lipid pathways,” says Simone. Understanding which pathway really appeals to a particular cancer – **some prefer sugar, some really go for fat** – “can tell us **how your cancer is driving its own energy**.”

One of the biggest challenges with chemotherapy, ADT, or even radiation therapy, is resistance to treatment: the cancer evolves to minimize the damage of attempts to kill it. “Diet can almost be a more powerful tool,” says Simone. “Cancers get smarter; a drug will work well for a while, then all of a sudden, cancer will figure out a way around it. The power of restricting food is that it provides less energy for the cancer to use up.”

Note: Caloric restriction is done under careful supervision by medical professionals. It is strongly recommended that you talk with your doctor before making changes to your diet.

For more information visit www.pcf.org, email info@pcf.org, or call 1-800-757-2873.