# Mushroom-supplemented soybean extract shows therapeutic promise for advanced prostate cancer

February 20 2013

A natural, nontoxic product called genistein-combined polysaccharide, or GCP, which is commercially available in health stores, could help lengthen the life expectancy of certain prostate cancer patients, UC Davis researchers have found.

Paramita GhoshMen with prostate cancer that has spread to other parts of the body, known as metastatic cancer, and who have had their testosterone lowered with drug therapy are most likely to benefit. The study, recently published in *Endocrine-Related Cancer*, was conducted in prostate cancer cells and in mice. Lowering of testosterone, also known as androgen-deprivation therapy, has long been the standard of care for patients with metastatic prostate cancer, but life expectancies vary widely for those who undergo this treatment. Testosterone is an androgen, the generic term for any compound that stimulates or controls development and maintenance of male characteristics by binding to androgen receptors.

The current findings hold promise for GCP therapy as a way to extend life expectancy of patients with low response to androgen-deprivation therapy. Paramita Ghosh, an associate professor in the UC Davis School of Medicine, led the pre-clinical study with a team that included UC Davis Comprehensive Cancer Center Director Ralph de Vere White, a UC Davis distinguished professor of urology. Ruth Vinall in the UC Davis Department of Urology and Clifford Tepper in the UC Davis

Department of Biochemistry and Molecular Medicine directed the studies in mice; Ghosh's laboratory conducted the cell studies.

The research focused on GCP, a proprietary extract cultured from soybeans and shiitake mushrooms and marketed by Amino-Up of Sapporo, Japan. Researchers found that the combination of the compounds genistein and daidzein, both present in GCP, helps block a key mechanism used by prostate cancer cells to survive in the face of testosterone deprivation.

The research team had earlier shown that when a patient's androgen level goes down, cancerous prostate cells kick out a protein known as filamin A, which is otherwise attached to the androgen receptor in the cell's nucleus. The androgen receptor regulates growth of prostate cancer cells. Once filamin A leaves the cancerous cell's nucleus, that cell no longer requires androgens to survive. Thus, loss of filamin A allows these cells to survive androgen deprivation, at and the cancer essentially becomes incurable.

The paper, titled "Enhancing the effectiveness of androgen deprivation in prostate cancer by inducing Filamin A nuclear localization," shows for the first time that GCP keeps filamin A in the nucleus. As long as this protein remains attached to the androgen receptor, the cancerous cells need androgens to survive and grow. They die off when starved of androgens, thus prolonging the effects of androgen deprivation, which ultimately prolongs the patient's life.

The team's hypothesis is that metastatic prostate cancer patients with the weakest response to androgen-deprivation therapy could be given GCP concurrently with androgen deprivation therapy to retain Filamin A in the nucleus, thereby allowing cancer cells to die off.

De Vere White is now pursuing funding to begin GCP human clinical

trials. Because GCP is a natural product rather than a drug, and requires fewer government approvals, it's expected that these trials will proceed rapidly once funded.

"We should know within the first eight months or so of human clinical trials if GCP works to reduce PSA levels," says de Vere White, referring to prostate-specific antigen levels, a tumor marker to detect cancer. "We want to see up to 75 percent of metastatic prostate cancer patients lower their PSA levels, and GCP holds promise of accomplishing this goal. If that happens, it would probably be a greater therapy than any drug today."

Provided by UC Davis