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Binghamton Research Group Develops New Cancer Treatment

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The team's studies prompted The American Urological Association to recommend cryosurgery as a primary cancer treatment, while team leader receives rare honor.

BINGHAMTON, N.Y., Sept. 16 /PRNewswire/ -- After years of innovation and intensive research, a team of Binghamton University (BU) researchers working with Cell Preservation Services, Inc., Owego, NY has broken extraordinary new ground in the recognition of cryosurgery as a primary treatment option for prostate cancer. The American Urological Association recently issued a Best Practices Statement that recommends cryosurgery of the prostate as both a primary and salvage therapy for patients with prostate cancer.

It was the team's discovery of a previously unrecognized form of cell death "apoptosis" and its research into the varying effects of treatment on different types of prostate cancer that led to the advanced technology that now makes cryosurgery of the prostate possible. The team working in partnership with physicians at Pittsburgh's Allegheny General Hospital has revolutionized the way prostate cancer is treated and continues to lead research into the advancement of treatment.

The recommended use of cryosurgery as a primary treatment comes as BU team leader Dr. John G. Baust, also a Professor of Biological Sciences at BU and UNESCO Chair, received a rare honor for his world-wide leadership in cryomedicine and his work with the BU team. The international Society for Cryobiology, recently elected Baust to the prestigious position of Fellow of the Society. He is one of only ten to receive this recognition from the Society.

As team leader, Baust directed fellow researchers in their quest to develop the surgical devices necessary to precisely apply the freezing temperatures to the prostate and work out the "biology of the disease" and its responses to freezing. The Allegheny General team developed the surgical protocols and managed the patients during the years that followed treatment to assure a successful outcome. Both teams partnered to teach this new therapy to many thousands of urologic surgeons and interventional radiologists at many of the major medical universities in the U.S. and Europe.

The key to perfecting the treatment came through an in-depth study that delved into to the molecular biology of prostate cancer and low temperature responses conducted by Dr. Robert Van Buskirk, Professor of Biological Sciences & Bioengineering. That's when Dr. William Hollister, a former BU graduate student now on the faculty of BCC, made a critical discovery, identifying a

previously unrecognized form of cell death following freezing known as "apoptosis" in a population of dying cancer cells.

"This was a key that opened the door" stated Baust. "We now had a path to both better understand how the freezing process killed prostate cancer but also how we might improve the efficiency of the death process during treatment."

Another BU doctoral student, Dr. John M. Baust, a Cornell University graduate, former Harvard Medical School Fellow and current President of Cell Preservation Services, Inc. (CPSI, Owego, NY), meticulously analyzed the timing of the molecular events that led to a cells demise following freezing.

"By understanding the sequence of events that often leads to cancer cell death, we were then able to have other researchers add secondary agents to further stress the cells so that we could assure the complete destruction of the cancer," said Dr. J.M. Baust.

An important unknown needed to be addressed to assure broad-based acceptance within the medical community was to understand and explain why some forms of prostate cancer respond differently to treatment. Dr. Daniel Klossner, a recent BU graduate working with the team, provided a critical answer by discovering that the presence or absence of a specific protein known as the "androgen receptor" correlates with the relative "hardiness" of the prostate cancer. The protein is found in easy-to-kill cancers while "old cancers," which lack the protein, present greater curative challenges. This discovery helped lead to the adoption of a set of standard treatment parameters. These findings may contribute to a change in how hormonal therapy is used in prostate cancer patients as the application of anti-androgen therapy often results in the emergence of more difficult to treat prostate cancers. Anthony Robilotto, MS., a Cornell graduate and current BU graduate student, is building on this foundation and working to develop the scientific basis for yet the next improvements. Robilotto has developed tissue-engineered human "prostates" that contain different genetic variants of the cancer and attempts to "cure" the cancers with innovative combinations of low temperature and sensitizing agents.

While this team's cancer research continues, the critical results of their ten years of patient treatment were recently published in the Journal of Urology. This landmark study demonstrated that 77% of patients treated at Allegheny General were cancer-free based on biopsy data. To date, over 40,000 prostate cancer patients have been treated with this therapy and the improved devices that have evolved.

The success of this project is now leading directly to its expansion into other problematic cancers. Dr. Kristi Snyder, a Cornell and BU graduate and current Director of Operations and Principal Scientist at CPSI, is moving this technology in new directions. She is collaborating with current BU graduate students to bring this life-saving technology into the breast, kidney and lung cancer patients.

"The prospects for expanding the application of cryosurgery to other focal tumors is absolutely exciting," said Snyder. "This is a therapeutic procedure that is applied in just a few minutes without traditional, invasive surgery, without the complicating co-morbidities common to radiation and chemotherapy, is relatively pain-free, is bloodless, and in the case of prostate cancer treatments, patients go home the same or next day. We need to keep moving

aggressively to expand this next generation therapy."

SOURCE Cell Preservation Services, Inc.

Mimi Hammond of Cell Preservation Services, Inc, +1-607-687-8701