Professor Steven Bova studies high-risk prostate cancer

STEVE BOVA is a prostate cancer researcher who joined the Tampere University faculty in 2011. His research group is working on developing systems for improved services for patients with cancer either already spread or at risk of spread outside the primary cancer site, and he is piloting this work in men with prostate cancer.

Prof. Bova got his start in prostate cancer research at Johns Hopkins Hospital in Baltimore, where he worked from 1991-2011. At Johns Hopkins, he started off doing academic surgery and pathology while he did a laboratory research fellowship in cancer genomics in the famed Brady Urological Institute. It was during this time that Prof. Bova realized that cancer genomics might allow us to study the evolution of cancer from the primary site to metastases.

Based on his unusual background in both pathology and surgery, in 1994 Bova started one of the first combined clinical-molecular autopsy studies of cancer titled "PELICAN" for Project to ELIminate lethal CANcer. This study was risky because the unprecedented level of organization required to succeed in such a study was still unknown, and many thought metastatic cancers were "too far gone" to yield any useful information. It was nearly impossible to sustain funding for the study because of lack of understanding among funding organizations, and even Prof. Bova grossly underestimated how long it would take to get to meaningful results. It took from 1994 to 2009, 15 years, before the first major discoveries came to light in a paper in the high impact journal Nature Medicine that has been cited by other researchers over 600 times up until today. Finnish researchers at Tampere University and Tampere University Hospital were key collaborators in that 2009 study, and this is how Prof. Bova became acquainted with Tampere.

Since his arrival in Tampere, Prof. Bova, together with colleagues in Tampere and with research collaborators around the world have used detailed clinical and genomic analyses in 33 men in the PELICAN study to describe, for the first time, the evolutionary history of lethal metastatic prostate cancer. Observations from this study allowed Prof. Bova and his team to identify the first observed case of subclone eradication in a metastatic solid tumor. This is an exciting discovery because it means that in some cases, chemotherapy actually does kill major branches of the "family tree" of a cancer, and by comparing the molecular findings in the eradicated and the resistant branches, it appears that it may be possible to identify drugs and treatments that could eliminate the remaining parts of thetumor. This is work now underway in collaboration with **Matti Nykter** here in Tampere, and **Kirsi Ketola** at University of Eastern Finland, along with other major centers in Finland.

The unfolding of understanding from the work underway in the in the PELICAN33 autopsy study led Prof. Bova to start a pilot of personalized medicine in men with significant prostate cancer who choose to undergo radical prostatectomy. This study seeks to build one of the first studies directly combining personalized medicine clinical trials based on cancer evolution together with advanced basic science studies. Funded by the Cancer Society of Finland, Sigrid Juselius Foundation, Business Finland, Academy of Finland, and Pirkanmaa Hospital District. If successful, the study will be extended to other centers and to other cancer types.