

**New Jersey State Commission on Cancer Research
LAY ABSTRACT OF RESEARCH PROJECT**

NAME OF PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR: **Shengkan Jin**

Project Title: **Study of tumor suppression mechanisms of autophagy**

Description: **The proposed study is to elucidate how reduction of autophagy, which is associated with 40%-75% of breast, ovarian, and prostate cancers, leads to tumor development.**

Breast and prostate cancers are two major tumors that inflict women and men, respectively. However the mechanisms underlying the development of these tumors are not fully understood. Recently, reduction of autophagy levels has been linked to some 40% - 75% sporadic breast, ovarian and prostate cancers. Moreover, genetic studies in mice from our group and others have established that autophagy is a novel tumor suppression process. Inactivation of one copy of an essential autophagy gene, *Beclin 1*, in mice leads tumor development, which is highly consistent with the observations in human cancers. Autophagy is a lysosome-dependent cellular degradation process, which has multiple cellular functions. The proposed project is to use the genetic engineered cell lines and mice recently developed from our group to examine the role of autophagy in cell growth, proliferation, cell death, mitochondrial function, mitochondrial turnover, and nuclear DNA mutation. The determination of which function(s) of autophagy is responsible for its role in cancer will help us understand the tumor development process of breast, prostate and other cancers. Furthermore, autophagy can be activated by rapamycin, a drug that is in clinical trials as anti-cancer drug. The results from our study may also provide detail information for future preclinical and clinical studies of testing rapamycin as a potential drug for breast, ovarian and prostate cancers with reduced autophagy.