2011

CaM Kinase Regulation of AKT and BAD in Prostate Cancer Cells

John M. Schmitt
*George Fox University, jschmitt@georgefox.edu*

Samantha F Smith
*George Fox University*

Follow this and additional works at: [http://digitalcommons.georgefox.edu/bio_fac](http://digitalcommons.georgefox.edu/bio_fac)

Part of the [Biochemistry, Biophysics, and Structural Biology Commons](http://digitalcommons.georgefox.edu/bio_fac), and the [Biology Commons](http://digitalcommons.georgefox.edu/bio_fac)

**Recommended Citation**

Schmitt, John M. and Smith, Samantha F, "CaM Kinase Regulation of AKT and BAD in Prostate Cancer Cells" (2011). Faculty Publications - Department of Biology and Chemistry. Paper 80.

[http://digitalcommons.georgefox.edu/bio_fac/80](http://digitalcommons.georgefox.edu/bio_fac/80)

This Article is brought to you for free and open access by the Department of Biology and Chemistry at Digital Commons @ George Fox University. It has been accepted for inclusion in Faculty Publications - Department of Biology and Chemistry by an authorized administrator of Digital Commons @ George Fox University. For more information, please contact arolfes@georgefox.edu.
CaM Kinase Regulation of AKT and BAD in Prostate Cancer Cells

Samantha F. Smith and John M. Schmitt

*Biology and Chemistry, George Fox University, Newberg, OR*

**Abstract**

AKT and its substrate BAD promote prostate cancer cell survival. Agonists, such as carbachol, and hormones that increase intracellular calcium concentration can activate AKT leading to cancer cell survival. LNCaP prostate cancer cells express the carbachol-sensitive M3-subtype of GPCR’s that increase intracellular calcium and activate the family of Ca2+/Calmodulin-dependent Protein Kinases (CaM Ks). One type of CaM Kinase, CaM Kinase Kinase (CaM KK), directly phosphorylates AKT on threonine 308. AKT phosphorylation and activation can enhance cell survival through phosphorylation BAD protein and the subsequent blockade of caspase activation. Our goals were to examine the mechanism of carbachol activation of AKT and BAD in LNCaP prostate cancer cells and evaluate whether CaM KK may be mediating carbachol’s activation of AKT and cell survival. The results suggest that carbachol triggered phosphorylation of both AKT and BAD in LNCaP cells. AKT and BAD phosphorylation were blocked by the selective CaM KK inhibitor, STO-609, as well as siRNA directed against CaM KK. Taken together this data suggests a role for CaM KK in the pathway. In addition, the bacterial toxin anisomycin triggered caspase activation in LNCaP cells that was blocked by carbachol treatment. Finally, our results suggest that carbachol treatment of LNCaP cells promoted cell survival through CaM KK and its phosphorylation of AKT.