

Tumor Suppressor WWOX: From Discovery to Preclinical Findings

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We have first discovered tumor suppressor WWOX, independently with two other groups, in 2000. Although it was originally designated as a tumor suppressor, *WWOX/Wwox* deficiency in the newborns of humans, mice and rats do not exhibit spontaneous tumor formation. Indeed, WWOX protein exhibits a plethora of physiological functions, including control of cancer growth and neural development and degeneration, participation of pY33-WWOX in apoptosis and bubbling cell death, integration with multiple signaling networks, and regulation of metabolism and immune cell differentiation. For example, exogenous complement C1q-mediated death of neuroblastoma and prostate cancer cells requires WWOX as an adaptor for death signaling. This type of cancer suppression is antibody-independent and a non-inflammatory action of C1q. Most recently, we have shown that during forced maturation, phorbol and calcium ionophore induce up regulation of WWOX phosphorylation at Ser14 in leukemia T cells. Furthermore, during cancer progression and neurodegeneration *in vivo*, target organs tend to have pS14-WWOX up regulation. Suppression of pS14-WWOX expression by Zfra (zinc finger-like protein that regulates apoptosis) results in blocking cancer growth and restoration of memory loss during neurodegeneration. The observations suggest that converting anticancer pY33-WWOX to pS14-WWOX renders enhancement of cancer growth and metastasis and progression of neuro degeneration.

Biography:

Dr. Nan-Shan Chang is currently the Distinguished Professor of the Molecular Medicine Institute, National Cheng Kung University (NCKU) in Taiwan, and the Adjunct Professor with the SUNY Upstate Medical University and the NYS Institute for Basic Research in Developmental Disabilities, New York. He is most noted for his discovery of tumor suppressor WWOX in 2000. Recent Awards: Breast cancer and neurofibromatosis research awards from the Department of Defense, USA, in 2008 and 2010; Distinguished Professor Award 2010, 2013, 2016 from NCKU; Distinguished Scientist Award 2011 from the Society of Experimental Biology & Medicine, USA.