Huai-Jen Tsai et al., J Proteomics Bioinform 2017, 10:5 (Suppl)
http://dx.doi.org/10.4172/0974-276X-C1-098



# Laser microdissection combined with microarray revealed key genes involved in regulating the uORF-mediated translational inhibition

**Huai-Jen Tsai, Hung-Chieh Lee and Chia-Zong Lin**
Mackay Medical College, Taiwan

Upstream open reading frame (uORF) located at the 5' untranslated region (5'UTR) has been reported that it is a repressive element for the translation of downstream coding sequence of transcripts. However, the molecular mechanism of the uORF-mediated translational inhibition (uORF-MTI) is mainly studied in *in vitro* system. An mRNA encoding human CCAAT/enhancer binding protein homologous protein (CHOP) is inhibited by its own uORF but this uORF-MTI is blocked when cells are exposed to ER stress. Previously we generated a zebrafish transgenic line huORFZ which harbors a human $uORF^{chop}$ ($huORF^{chop}$) fused with GFP reporter. Since GFP signals were expressed in some sub-type of brain cells, we employed laser microdissection combined with microarray analysis to analyze the gene expression profiles between GFP(+) and GFP(-) brain cells. Among up-regulated putative genes, we selected *dkey* because it had 4.7-fold greater presence in the GFP-expressing cells. Interestingly, we demonstrated that the overexpression of *dkey* could induce the appearance of GFP in zebrafish embryos, even though no stress had been administered, suggesting that *Dkey* may play a negative effect of $huORF^{chop}$-MTI. On the other hand, among down-regulated putative genes, we selected kinase C-enhanced Protein phosphatase 1 inhibitor (KEPI) gene, which was significantly down-regulated in GFP(+) cells and is highly conserved in zebrafish and humans. Taken together, we propose that *dkey* and kepi may be directly involved in the regulation of $huORF^{chop}$-MTI, but they play opposite functions, during ER stress.

## Biography

Huai-Jen Tsai has completed his PhD from Oregon State University and Post-doctoral studies from John Hopkins University School of Biology. He has published more than 100 papers in reputed journals. After he retired from Institute of Molecular and Cellular Biology, National Taiwan University, he continues his teaching and research work in the Institute of Biomedical Sciences, Mackay Medical College.

hjtsai@ntu.edu.tw

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