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The Auditorium (Level 1)

Hosted by: Dr YU Feng Wei

Targeting autophagy and lysosome in cancer therapy

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Dr. Shen Han-Ming graduated from Zhejiang Medical University, China, with a Bachelor of Medicine and Master of Medicine in 1985 and 1988, respectively, and a PhD from NUS in 1996. He received his postdoc training in NUS and in the National Cancer Institute, NIH, USA. The main research interest of his lab at the Department of Physiology, NUS is on autophagy and cancer cell biology. Up to date, Dr. Shen has published more than 130 articles in peer-reviewed international journals, with more than 8000 total citations and an H-index at 51. He is the Editorial Board member of Autophagy and Frontiers in Cell and Developmental Biology, and the Academic Editor of PLOS ONE. He enjoys travel and photography as his main hobby.

In the past several years, we have studied the lipid and lipid rafts in regulation of autophagy. In this presentation, I will discuss the following 3 aspect of our work, including (i) free fatty acid in regulation of autophagy, (ii) critical role of Stearoyl-CoA Desaturase 1 (SCD-1) in lipogenesis and autophagy, and (iii) our ongoing work on lipid rafts and caveolin-1 in lysosomal function and autophagy. We demonstrate for the first time that CAV1 deficiency promotes both the basal and inducible autophagy. Interestingly, the promoting effect was found mainly on the late stage of autophagy via enhancing lysosomal function and autophagosome-lysosome fusion. Furthermore, the elevated autophagy level induced by CAV1 deficiency serves as a cell survival mechanism under starvation. Importantly, down-regulation of CAV1 and enhanced autophagy level were observed in human breast cancer cells and tissues. Our findings support the notion that autophagy is an important pro-survival mechanism, especially for cells under various stress conditions, and for cancer cells with Cav-1 deficiency. Moreover, our data also suggest that breast cancer patients with low or defective Cav-1 are suitable for autophagy-targeted chemotherapy.

Recent Publications:

1. Shi Y, Tan SH, Ng S, Zhou J, Yang ND, McMahon KA, del Pozo MA, Hill MA, Parton RG, Kim YS, Shen HM*. Caveolin-1 and lipid rafts play a critical role in determining cell stress responses in human breast cancer cells via modulation of autophagy and lysosomal function. Autophagy (in press).
- 2.. Zhou J, Tan SH, Nicolas V, Bauvy C, Yang ND, Zhang J, Xue Y, Codogno P, Shen HM*. Activation of lysosomal function in the course of autophagy via mTORC1 suppression and autophagosome-lysosome fusion. Cell Res. 2013 Apr;23(4):508-23.
3. Shen HM*, Mizushima N. At the end of the autophagic road: an emerging understanding of lysosomal functions in autophagy. Trends Biochem Sci. 2014 Feb;39(2):61-71.