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Ribophorin II (RPN2) as a novel therapeutic target for cancer stem cells

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The survival rate for women with advanced, metastatic breast cancer has not changed significantly for decades. Regardless of effective therapies, many women still experience recurrences of breast cancer after treatment. Docetaxel has been shown to be beneficial in the treatment of breast cancer; however, almost half of treated patients do not respond to it and many tumors develop resistance. At present no method exists to predict response to docetaxel or to detect resistance. Moreover, target molecules to increase the efficacy of chemotherapy have not yet been identified. Here we found that inhibition of the ribophorin II (*RPN2*), a part of oligosaccharyltransferase (OST) complex, promoted docetaxel-dependent apoptosis and inhibited cell growth in a docetaxel-resistant human breast cancer cell line. Silencing of *RPN2* resulted in decreased glycosylation and membrane localization of the P-glycoprotein efflux pump, which caused increased sensitization of drug resistant cells to docetaxel (Nat Med, 2008). We also currently found that RPN2 is highly expressed in breast cancer stem cells. Knockdown of RN2 in cancer stem cells by shRPN2 vector system allowed a significant inhibition of cancer growth and lymph node metastasis in vivo. We also found that small non-coding RNA tightly regulates *RPN2* gene expression. *RPN2* could, therefore, have clinical applications as a target for micromanaging cancer stem cells.

Biography

Dr. Takahiro Ochiya is Chief of Division of Molecular and Cellular Medicine at the National Cancer Center Research Institute, Tokyo and he is also appointed as a invited professor of Waseda University (since 2004) and Tokyo Institute of Technology (since 2008). After he got Ph.D. in 1988 in Osaka University and then went to do a post-doc at La Jolla Cancer Research (Burnham Institute for Medical Research), CA, USA. Dr. Ochiya's lab focuses the development of novel animal models, methods, and strategies to study cancer development and metastasis. Especially, current focus are siRNA- and microRNA-based therapy against cancer stem cells.