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TMC01 is a novel target for cancer chemotherapy

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TMCO1 is a novel target for cancer chemotherapy

College of Sciences and Health Professions

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Abstract

Transmembrane and coiled-coil domains 1 (TMCO1) is a protein of 22 KDa highly conserved in amino acid sequence among mammalian species and functions as an endoplasmic reticulum (ER) Ca²⁺-load-activated Ca²⁺-channel. Homozygous frameshift mutation in TMCO1 causes distinctive craniofacial dysmorphism, skeletal anomalies, and mental retardation. However, its physiological functions are largely unknown. In this study, we found that TMCO1 was co-localized with microtubules as determined by immunohistostaining and a co-sedimentation assay. Interestingly, TMCO1 was highly expressed in the invasive front of high grade lung cancer and metastatic cancer cells of clinical specimens. To further investigate the biological role of TMCO1 in lung cancer, we knocked it down in A549 cells, a human lung adenocarcinoma cell line, by using shRNA lentiviral particles. Disruption of TMCO1 in the cells resulted in delayed microtubule polymerization and remarkably increased acetylation of α -tubulin. In addition, A549 cells lacking of TMCO1 grew significantly slower than the control cells. Taken together, our findings suggest that TMCO1 may be a therapeutic target for lung cancer treatment.