Protein CMTM7 promotes autophagy, tumor suppression in cancer cells

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Abstract

CMTM7 is a tumor-suppressing protein that inhibits the growth of cancer cells in the esophagus and lungs. Studies suggest that CMTM7 suppresses tumor progression by regulating autophagy, the cell's waste disposal process, but exactly how CMTM7 regulates autophagy has remained unclear. A new study reveals some of the molecular machinery CMTM7 uses to influence autophagy and stop cancer cell growth. Initial experiments on human cancer cells confirmed that overexpressing CMTM7 led to enhanced autophagy while eliminating CMTM7 impaired autophagy. Further experiments showed that CMTM7 interacts with the proteins Beclin1, VPS34, and ATG14L and with the autophagy-associated protein Rab5. This ensemble of molecules—led by CMTM7—works together to promote autophagy in the cell. To examine the resulting effect on tumor growth, researchers eliminated CMTM7 from cancer cells injected into mice. They found that CMTM7 knockdown was linked to an increase in tumor volume and weight. Understanding how this cascade of protein interactions plays out in different tumor cells could lead to the development of more effective anti-cancer therapies.