3-P-111

Poster Sessions

Exploratory research in plant-derived natural organic compounds with antitumor activity targeting choline transporter

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Choline is an organic cation that plays a critical role in the structure and function of biological membranes. Intracellular choline accumulation through choline transporters is the rate-limiting step in phospholipid metabolism, and it is a prerequisite for cell proliferation. In this study, we examined the functional characterization of choline transporters in MIA PaCa-2 pancreatic cancer cells. Furthermore, we searched for compounds that inhibit choline uptake as well as cell proliferation in a plant-derived natural organic compound library. Choline uptake is Na⁺-independent and mediated by a single transport system. Choline transporter-like protein 1 (CTL1) and CTL2 mRNA are highly expressed. We found three hit compounds that inhibit choline uptake and cell proliferation from 500 plant-derived natural organic compounds. These hit compounds reduced cell survival and enhanced caspase-3/7 activity. These results suggest that CTL1 and CTL2 are functionally expressed in pancreatic cancer cells and are also involved in abnormal proliferation. Identification of this CTL1- and CTL2-mediated choline transport system provides a potential new target for pancreatic cancer therapy.