Pyridinium fullerene derivative inhibits cell growth by suppression of Wnt signaling in virus-infected non-Hodgkin's B-cell lymphoma cell.

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Primary effusion lymphoma (PEL) is defined as a rare subtype of non-Hodgkin's B-cell lymphoma which is caused by Kaposi's sarcoma-associated herpesvirus (KSHV) in immunosuppressed patients. PEL is frequently resistant to conventional chemotherapies such as CHOP. Therefore, novel therapeutic options for PEL have been expected. We had reported that a pyrrolidinium fullerene derivative induces apoptosis via Akt suppression in PEL.

Here, we have synthesized eight pyridinium-type cationic fullerene derivatives and evaluated cytotoxic effects of them against PEL. The pyridinium fullerenes decreased the cell viability of PEL compared with KSHV-uninfected B-lymphomas. The most potent derivative suppressed Wnt signaling by β-catenin downregulation in PEL cells, whereas it did not affect MAPKs, NF-kB and Akt signaling. The fullerene derivative decreased not β-catenin mRNA, but β-catenin protein in PEL cells. NF-kB, MAPK, and Wnt pathways are constitutively activated in PEL, and these activations are thought to be necessary for cell survival and growth of PEL. We consider that the pyridinium fullerene exerts an anti-PEL activity by disrupting Wnt signaling. Now, we are attempting to elucidate the mechanism of β-catenin downregulation by the fullerene derivative.