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## Sugar-modified PPI dendrimers as carriers of anti-leukemia drugs

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A nticancer drugs such as cytarabine (araC) belong to nucleoside analogues (NAs). NAs are commonly used in the treatment of acute myeloid leukemia, acute lymphocytic leukemia and lymphomas. AraC acts by interfering with newly synthesized nucleic acids or by modifying physiological nucleosides metabolism. Like most nucleoside analogs, araC is administered as an inactive pro drug and requires specialized nucleoside transporters to cross plasma membranes. Inside a cell, araC is activated to cytotoxic 5'-triphosphates form (araCTP) by intracellular kinases. Unfortunately, a therapy based on cytarabine has its limitations due to several primary and acquired resistance mechanisms that arise during pro drug activation steps. It may lead to inefficient concentration of the therapeutics in cancer cells. Carrier systems that would deliver active forms of NAs are currently seeking. It has been demonstrated that polypropylene imine (PPI) dendrimers with a partially modified surface by maltose residues (PPI-m) easily form complexes with negatively charged 5'-triphosphates of nucleoside analogues. It happens due to the presence of protonated primary and tertiary amino groups. PPI-m dendrimers are non-toxic and highly biocompatible. Moreover, PPI-m dendrimers protect bound drug molecules from enzymatic degradation. Complexes of araCTP and PPI-m dendrimers show enhanced cytotoxic activity against an acute myeloid lukemia cell line 1301 in comparison with free cytarabine and 5'-triphosphate of cytarabine. Thus, PPI-m dendrimers improve stability of NAs and efficiently deliver the active drug forms directly to cancer cells. To sum up, maltose-modified polypropylene imine dendrimers are attractive systems as anticancer drug carriers especially with a vision to apply them when drug-resistance occurs.

## **Biography**

Barbara Klajnert-Maculewicz has completed her PhD in 2002 from the University of Lodz, Poland and Postdoctoral studies from the McMaster University, Ontario, Canada. She is a professor at the University of Lodz, Poland and an External Scientific Member at Leibniz IPF in Dresden, Germany. She is a co-author of 2 books and 9 chapters in monographs. She has published more than 90 papers in reputed journals (h-index 23). In the years 2009-2012 she was the Management Committee Chair of COST Action TD0802 "Dendrimers in biomedical applications" that gathered 24 countries. She has been awarded L'Oréal-UNESCO Fellowship for Women in Science.

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