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Cationic derivatives of polyisoprenoid alcohols for liposomal drug delivery

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Polyisoprenoids represent a large and diverse class of naturally occurring hydrophobic polymers, found in almost all living organisms. These linear compounds, constructed of 5 to more than 150 isoprene units, are commonly divided into dolichols (with hydrogenated α -bond) and α -unsaturated polyprenols. Polyisoprenoid alcohols play numerous roles in cells but above all, as structural components of cellular membranes, they modulate their properties. Biophysical studies proved that polyisoprenoids act as membrane modulators by influencing their fluidity and permeability. Latest research demonstrated that semi-synthetic, cationic derivatives of polyisoprenoid alcohols (called amino-prenols, APrens) possess lipofecting properties, because they facilitate the transfer of genetic material towards the cells. Amino-prenols were obtained by chemical modification in that hydroxyl group on α end was replaced by a quaternary ammonium group. This generated specific properties, whereby these cationic lipids can influence biological membranes more easily and effectively. Hence, the idea to use amino-prenols as components of liposomal carriers of drugs and genetic material was obtained. In the first stage of our study, we tested potential toxicity of novel carriers with particular emphasis on their impact on renal function. In the next steps, we examined usefulness of newly designed carriers for liposomal delivery of various drugs. Obtained results lead us to suspect that amino-prenols can be used as components of drug carriers, not only augmenting the biodistribution of active substances, but also improving the stability and loading capacity of liposomes. In the future, we plan to further study amino-prenols in an attempt to enhance gene expression *in-vivo*.

Biography

Olga Gawrys is a young Scientist from Poland. Her academic interests relate to renal function, experimental medicine and liposomal drug carriers. She is a Graduate of the Institute of Biotechnology (Warsaw University of Technology) with MSc in Chemical Biotechnology – Drugs and Cosmetics. In 2015, she completed her PhD in Medical Sciences, in the discipline of Medical Biology (MMRC PAS). Recently, she published 3 papers and presented her work at a variety of conferences. She received a scholarship for the best PhD students of the MMRC PAS and a scholarship for PhD students carrying out applied research projects (EU).

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