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## Review article

Polymeric bile acid sequestrants: Review of design, *in vitro* binding activities, and hypocholesterolemic effectsEva Heřmánková<sup>a</sup>, Aleš Žák<sup>b</sup>, Lenka Poláková<sup>a</sup>, Radka Hobzová<sup>a</sup>, Róbert Hromádka<sup>c</sup>, Jakub Širc<sup>a,\*</sup><sup>a</sup> Institute of Macromolecular Chemistry, Czech Academy of Sciences, Heyrovsky sq. 2, CZ-162 06 Prague, Czech Republic<sup>b</sup> 4th Department of Medicine, First Faculty of Medicine, Charles University, U Nemocnice 2, CZ-128 08 Prague, Czech Republic<sup>c</sup> Research and Development Center, C2P s.r.o. Chlumeck nad Cidlinou, Czech Republic

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## ABSTRACT

Polymeric bile acid sequestrants (BAS) have recently attracted much attention as lipid-lowering agents. These non-absorbable materials specifically bind bile acids (BAs) in the intestine, preventing bile acid (BA) reabsorption into the blood through enterohepatic circulation. Therefore, it is important to understand the structure–property relationships between the polymer sequestant and its ability to bind specific BAs molecules. In this review, we describe pleiotropic effects of bile acids, and we focus on BAS with various molecular architectures that result in different mechanisms of BA sequestration. Here, we present 1) amphiphilic polymers based on poly(meth)acrylates, poly(meth)acrylamides, polyalkylamines and polyallylamines containing quaternary ammonium groups, 2) cyclodextrins, and 3) BAS prepared *via* molecular imprinting methods. The synthetic approaches leading to individual BAS preparation, as well as results of their *in vitro* BA binding activities and *in vivo* lipid-lowering activities, are discussed.

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