# ZWITTERIONIC COATING FOR THE LDL-APHERESIS ADSORBENTS

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Extracorporeal organ support systems, e.g. low-density lipoprotein (LDL) apheresis, represent an important field of application for biomaterials. Upon contact with blood, biomaterials immediately acquire a layer of host proteins and coagulation factors, which create a new interface between the biomaterial and the blood, potentially leading to unwanted side effects [1].

We propose to develop blood compatible matrices for whole blood LDL apheresis. The focus of the work is on the surface modification of adsorbent polymers by zwitterionic coatings with the aim to minimize platelet activation and adhesion upon contact of the adsorbents with whole blood. Zwitterionic surfaces are hydrophilic and highly charged, but neutral, leading to significantly reduced adsorption of cells and proteins. For this study, a novel sulfobetaine zwitterionic statistical terpolymer is synthesized by free-radical polymerization of *N*-(methacryloyloxyethyl)-*N*,*N*-dimethyl-N-(3-sulfopropyl) betaine (■), 4-azidophenyl methacrylamide (●) and NBD-aminoethyl methacrylate monomers (♦). Upon irradiation with UV light the photolabile aryl azide moiety is transformed to the reactive aryl nitrene form. This feature is used for the covalent deposition of zwitterionic copolymers on the surface of methacrylate based adsorbents employed in whole blood LDL apheresis (Figure 1).

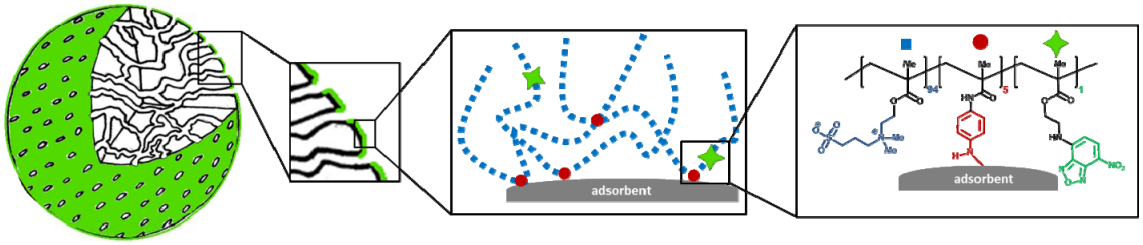


**Figure 1**: Graphical visualisation of the coating of the adsorbent beads.

[1] V. Semak, M. B. Fischer, and V. Weber, "Biomimetic principles to develop blood compatible surfaces," *Int. J. Artif. Organs*, vol. 40, no. 1, pp. 22–30, 2017.