

IMPACT OF POLYLYSINE DENDRIMERS ON BIOLOGICAL MEMBRANESMARTA JOKIEL, BARBARA KLAJNERT and MARIA BRYSZEWSKADepartment of General Biophysics, University of Łódź,
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Low molecular mass polylysine dendrimers are new branched molecules having antimicrobial and antifungal properties. Due to their characteristics they seem to have promising future as potential drugs. Unfortunately, their biological properties are still unexplored. In our work we used R121, R124, R131, R155 and R169 dendrimers and studied their impact on erythrocyte ghosts. Two different experimental methods were employed. We used fluorescence probes (DPH and 2AS) to estimate membrane fluidity and we checked how dendrimers change DPPC gel-liquid crystalline transition by using differential scanning calorimetry (DSC). DPH is a useful tool to investigate the structure and dynamic properties of membranes. It exhibits a strong fluorescence increase upon binding to lipids and anisotropy of emission is sensitive to phospholipids order. Due to DPH hydrophobic nature it is located in the lipid core of membranes. 2AS covalently attaches to the phospholipid acyl chain. Both fluorescent probes were used to investigate membrane alterations upon addition of polylysine dendrimers. Our results show that the rotational mobility of lipids in ghosts membranes increases with an increasing dendrimers concentration. All dendrimers can affect membrane function by altering the environment of all of its components. They can penetrate the membrane and disrupt its structural and functional integrity. DSC results showed the loss of the pretransition as well as enhancement of co-operativity of the main transition. The steric distribution and type of hydrophobic groups strongly influenced dendrimer – membrane interactions.