# [P-W-695] INFLUENCE OF NANOPOLYMERS WITH DIFFERENT END-FUNCTIONALITIES ON PLATELETS AND COAGULATION. AN EX-VIVO STUDY

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**Introduction:** Dendrimers are nanoscale, branched polymers with multiple end-functionalities that have great potential as delivery vehicles for drugs and imaging agents. Biodistribution and cell uptake of the dendrimers appears to be influenced by the type of end-group and surface charge. The study objective is to determine the interaction of polyamidoamine (PAMAM) dendrimers with platelets and coagulation proteins.
**Methods:** The effect of 1, 10, 100, and 1000 mcg/ml of PAMAM dendrimers with COOH (anionic), OH (neutral) and NH2 (cationic) end functionalities, on hemostasis was evaluated using thromboelastography (TEG), whole blood platelet aggregation (WBA), and flow cytometry (FC), following a 30 minute incubation with whole blood or platelets. Platelets were incubated with FITC labeled dendrimers to determine uptake over time by FC. All tests were performed in triplicate.
**Results:** WBA and TEG: Dendrimers with COOH and OH end-groups had no effect on platelet aggregation or clot formation (time to clot formation and size of clot) even at the highest concentrations. Dendrimers with NH2 end group caused significant spontaneous platelet aggregation and ATP release with resultant platelet exhaustion (noted on WBA) leading to delayed initiation of clot and decreased size (noted on TEG), only at concentrations of 100 and 1000 mcg/ml. Flow Cytometry: Spontaneous CD62 activation was seen in platelets incubated with NH2, but not with COOH or OH. A significant increase in the platelet uptake of FITC labeled dendrimer was noted within 30 mins for NH2 while there was minimal uptake of OH even at 60 min.
**Conclusions:** Dendrimer surface charge plays a significant role on the effect on hemostasis. Due to the lack of effects on hemostasis, the neutral (-OH) and anionic (-COOH) dendrimers may be better suited as intravascular drug delivery vehicles. Therefore, by modifying the surface functionality, these novel polymers can be tailored to deliver drugs to the site of action with minimal side effects.
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