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Materials Assessment for the Development of Photopolymerizable Resins Towards the Commercialization of Novel

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Abstract

The research and development proposal that follows defines specific aims towards the commercialization of a photopolymerizable vascular occlusion and embolic system. Interventional Neuro-Radiologist could utilize this technology when therapeutic or palliative embolization of a brain arteriovenous malformation (BAVM) is indicated to minimize blood loss or to reduce the BAVM size prior to surgery. The photopolymerization resin consists of a methacyrlate monomer, a monomer viscosity modifier, photointiator and accelerator. Resin formulations can be tailored to clinical viscosity requirements. Resins can also be optimized to targeted light sources within the visible light spectrum so as to insure desired cure rates and depths. Resins with similar ingredients are currently used for biological applications, dental and orthopedics. Previous research demonstrated that the polymerization can be accomplished in 15 seconds or less.

The major advantage of this system over the existing liquid embolic devices is the ability to cure the resin at a specific time and place. Current state of the art methods of embolization utilize n-Buytl Cyano-Acrylate (Trufill® from Cordis) or resins based on dimethyl sulfoxide (ONYX® from Micro Therapeutics Inc.). Both Trufill® and ONYX® liquids polymerize upon contact with blood.

The long term objective is to commercialize the technology as a Federal Drug Administration approved Class III device for Neurology/Artificial Embolization.