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Shape Memory Polymers for Biomedical Applications



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Abstract: Our experience with shape memory polymers (SMP) began with a project to develop an embolic coil release actuator in 1996. This was the first known SMP device to enter human trials. Recent progress with the SMP devices include multiple device applications (stroke treatments, stents, other interventional devices), functional animal studies, synthesis and characterization of new SMP materials, in vivo and in vitro biocompatibility studies and device-tissue interactions for the laser, resistive, or magnetic-field activated actuators. The seminar will highlight our most recent work in SMPs and SMP devices: foam scaffolds for treating aneurysms, healing pathology of implanted foams, clotting dynamics in the foam, new SMP materials, and modeling SMP devices.

Biography: Duncan Maitland, Ph.D., has worked as an engineer in aerospace, national defense and biomedical applications since 1985. He received his B.E.E. (Electrical Engineering) and M.S. (Physics) degrees from Cleveland State University. He received his Ph.D. in Biomedical Engineering from Northwestern University. After his Ph.D., he worked at Lawrence Livermore National Laboratory for twelve years and subsequently joined the Department of Biomedical Engineering at Texas A&M University in 2008. His research projects include endovascular interventional devices, microactuators, optical therapeutic devices and basic device-body interactions/physics including computational and experimental techniques.