# Fabrication and Application of Photocrosslinked, Nanometer-Scale, Physically Adsorbed Films for Tissue Culture Regeneration

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Abstract  
This study describes the development and cell culture application of nanometer thick photocrosslinkable thermoresponsive polymer films prepared by physical adsorption. Two thermoresponsive polymers, poly(N-isopropylacrylamide (NIPAm)-co-acrylamidebenzophenone (AcBzPh)) and poly(NIPAm-co-AcBzPh-co-N-tertbutylacrylamide) are investigated. Films are prepared both above and below the polymers' lower critical solution temperatures (LCSTs) and cross-linked, to determine the effect, adsorption preparation temperature has on the resultant film. The films prepared at temperatures below the LCST are smoother, thinner, and more hydrophilic than those prepared above. Human pulmonary microvascular endothelial cell (HPMEC) adhesion and proliferation are superior on the films produced below the polymers LCST compared to those produced above. Cells sheets are detached by simply lowering the ambient temperature to below the LCST. Transmission electron, scanning electron, and light microscopies indicate that the detached HPMEC sheets maintain their integrity.  
  
KEYWORDS:  
adsorption; cross-linking; pNIPAm; thermoresponsive polymer; tissue engineering  
  
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