

**MICROSTRUCTURAL CHANGES IN POLYESTER BIOTEXTILES DURING  
IMPLANTATION IN HUMANS****Martin W. King<sup>1,2</sup>, Ze Zhang<sup>2</sup> and Robert Guidoin<sup>2</sup>**<sup>1</sup>College of Textiles, North Carolina State University, Raleigh, NC 27695-8301, USA<sup>2</sup>Québec Biomaterials Institute, Laval University, CHUQ, Saint-François d'Assise Hospital,  
Québec City, Canada**ABSTRACT**

*We have previously reported that polyester arterial prostheses experience losses in strength and molecular weight while implanted in humans over extended periods. This study used thermal analysis, FTIR spectroscopy and vapor phase dyeing techniques to characterize changes in the microstructure of poly(ethylene terephthalate) biotextiles retrieved from patients after 2 to 16 years in vivo. It found that polyester fibers become increasingly more crystalline due to hydrolytic biodegradation near the surface, which results in a loss of amorphous material, and through a slow annealing effect of the body, which at 37 °C causes the larger crystalline domains to grow at the expense of the smaller ones.*

**KEYWORDS:** biotextile, biodegradation, crystallinity, implant retrieval, infrared spectroscopy, polyester, thermal analysis, vapor phase dyeing

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