

Photo- and Electro-activated Carbene Tissue Adhesives

Speaker:

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Presentation Abstract

Instant curing adhesives typically fall within two categories, being activated by either heat or chemical means. These curing strategies limit applications to specific substrates and can only be activated under limited certain conditions. A significant need exists for adhesives that allow for manipulation and subsequent adhesive activation in wet or low temperature surfaces. Herein, we present the development of an instant curing adhesive through photo- or low voltage activation. The photocuring and electrocuring bioadhesives are synthesized by grafting carbene precursors on dendrimers to form viscous liquids. The adhesives are activated at low UV intensities (1-50 mW. cm⁻²) or voltages (<10V with material properties evaluated in real-time using photo- or electro-rheology with aim to mimic anisotropic tissue moduli. Crosslinking initiation and propagation are observed to be stimulus and time dependent, enabling tuning of both elasticity and adhesive strength. Adhesion bond strengths on a variety of soft tissue substrates will be presented.

Monday, 19.11.18, 14:00 – 15:00, Room 300

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