CHEMICAL FUNCTIONALIZATION OF SYNTHETIC MELANIN FOR USE IN A FORENSIC SKIN SIMULANT. **Kgalalelo Rampete**[1], Jean-Paul Desaulniers[1,2], Theresa Stotesbury[1,2], [1]Applied Bioscience Graduate Program, Faculty of Science, Ontario Tech University, 2000 Simcoe St N, Oshawa, Ontario, L1G 0C5, Canada. [2]Faculty of Science, Ontario Tech University, 2000 Simcoe St N, Oshawa, Ontario, L1G 0C5, Canada.
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Skin simulants have been widely used in forensic research to investigate the properties of human skin at crime scenes. Previous research showed synthetic polymer materials were the most advantageous alternative as they can be tuned to mimic skin behavior. However, these materials lacked the optical and possible mechanical characteristics of skin imparted by melanin, a biomolecule, and pigment primarily responsible for UV absorbance and thermal regulation. We propose a new set of biomaterials, alginate-melanin polymers as candidate forensic skin simulants. Our current research explores the synthetic melanin functionalization and covalent immobilization to an alginate base material. Using propargyl bromide, we successfully reacted the amine moieties in melanin to yield melanin-modified propargyl groups and confirmed this using NMR spectroscopy, ATR-FTIR spectroscopy, and mass spectrometry. Broad-band absorption in the VIS region was observed using UV-VIS spectroscopy, confirming optical properties. We observed ATR-FTIR peak shifts at 2252 – 2292 cm^{-1}, together with a *m/z* of 394.3 from mass spectrometry indicating the alkyne's presence. Additionally, mechanical testing showed successful crosslinking of our polymers as they possessed the same optical properties. Consequently, this work supplements present synthetic biomaterials for forensic skin simulants and highlights the importance of incorporating biomolecules within such models.