

Electroactive Biodegradable Polymers with Photoacoustic Contrast

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PennState

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- photoacoustic imaging
- biodegradable polymer
- citrate-based biomaterials
- photoluminescence
- electroactive aniline tetramer

Researchers

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Other Researchers

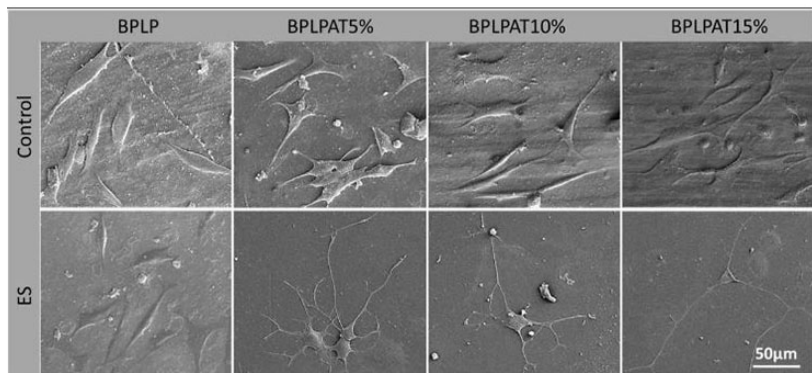
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Electrical stimulation study on BLPATs

Technology Summary

Citrate-based biodegradable photoluminescent polymers (BPLPs) with pendant aniline tetramers (ATs) have been developed by Penn State researchers. The addition of ATs provides similar electroactivity to polyaniline but with improved mechanical properties, biocompatibility/biodegradability, and solubility. The pendant ATs also endow these so-called BLPATs with photoacoustic contrast, allowing for dual-mode photoacoustic/fluorescence imaging. These capabilities enable high-resolution, high-contrast bioimaging of films, scaffolds, or nanoparticles comprising BLPATs, even when implanted within deep tissue (i.e., depths > 2 cm). The SEM images in the figure above show that BLPAT films promote neurite formation even without electrical stimulation (Control, top row), although electrical stimulation helps generate more and longer neurites (ES, bottom row).

Application & Market Utility

Bioimaging is a vital component of theranostic systems, and multimodal bioimaging has garnered extensive attention recently because of its ability to provide more comprehensive spatiotemporal information to assess biomaterials in situ. In contrast to the complex, multicomponent design of traditional theranostic systems, biomaterials comprising BLPATs integrate dual-mode photoacoustic/fluorescence imaging with electroactive and photothermal therapeutic capabilities via a convenient, efficient, cost-effective, catalyst-free, one-pot polycondensation reaction.

Next Steps

Seeking research collaboration and licensing opportunities.



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