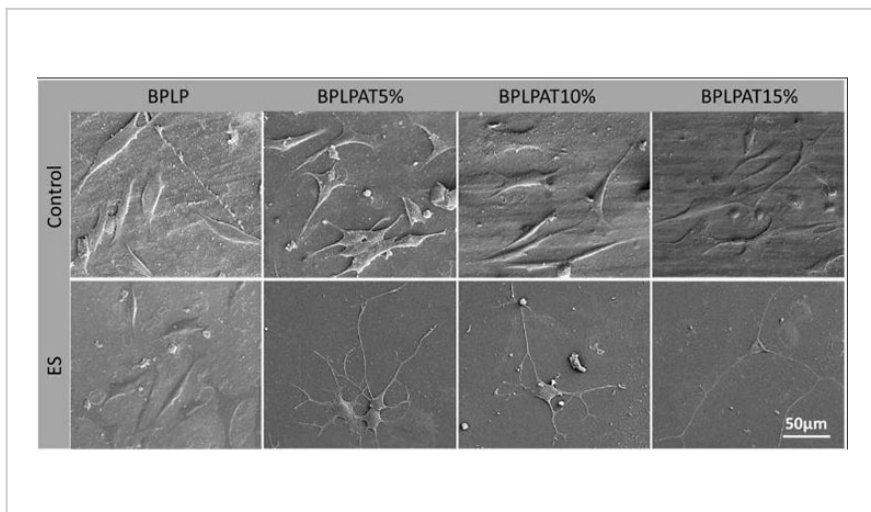


# Electroactive Biodegradable Polymers with Photoacoustic Contrast

ID# 2015-4387



PennState



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.

TECHNOLOGY READINESS LEVEL

4-7

### Seeking

Investment | Licensing | Research

### Keywords

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

### Researchers

**Jian Yang**

Professor of Biomedical Engineering

[Website](#)

### Other Researchers

**Dingying Shan**

### Originating College

College of Engineering

### Office of Technology Management Contact

Ritter, Dustin

dwr18@psu.edu

814-863-7070



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at [invent.psu.edu](http://invent.psu.edu).

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.