

## Peptide materials for immunomodulation

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### Meet the Inventors

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### Department

Biomedical Engineering (BME)

### External Link(s)

- [From the lab of Dr. Joel Collier](#)

### Value Proposition

Glatiramoids are biomaterials synthesized for use as immunomodulators. Specifically, they are polypeptide mixtures with randomized amino acid sequences. Glatiramoids are currently FDA approved for use in multiple sclerosis. They have also been explored in numerous clinical trials towards the treatment of other diseases including autoimmune, inflammatory bowel, and neurodegenerative diseases. However, glatiramoids have yet to demonstrate enough clinical efficacy to be approved for any diseases beyond multiple sclerosis. The biophysical properties have long been suspected to be relevant to the efficacy of glatiramoids, but they cannot be easily adjusted in conventional randomized polypeptides in order to optimize their therapeutic benefit.

### Technology

Duke researchers have invented a platform for creating glatiramoid-based immunomodulatory biomaterials with improved control over the biophysical properties. This is achieved using supramolecular glatiramoids that self-assemble into nanofibers. The nanofiber form enhances the uptake of the material by antigen-presenting cells and prolongs the persistence of the material. Additionally, the ability to co-assemble the randomized polypeptides along with other immune epitopes to form integrated materials and to control the charge, hydrophobicity, and other physical properties of the nanofibers offer control that is not currently available with glatiramoids. The inventors have demonstrated that supramolecular glatiramoids can induce non-inflammatory T-cell responses and raise antibodies with less repetitive dosing than previous glatiramoids.

### Advantages

- A biomaterial platform that could be applied towards the treatment of a range of diseases
- Gives more control over tuning the properties of FDA-approved class of glatiramoids
- Material synthesis is easy to reproduce

