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Herz Global Impact Award

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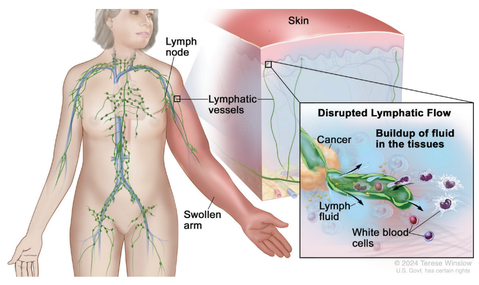
Sustained, Local Drug Delivery to Treat Lymphedema

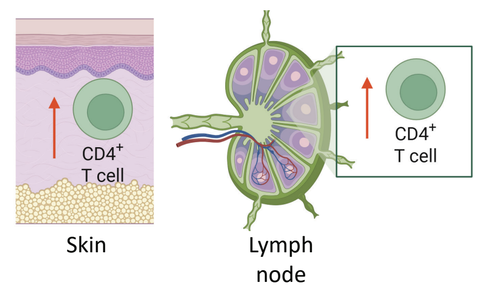
We are developing an injectable, thermosensitive hydrogel for lymphatic delivery of immunomodulatory drugs and lymphatic pump function modulators to improve lymphatic function in lymphedema.

Secondary lymphedema is a chronic, debilitating disease

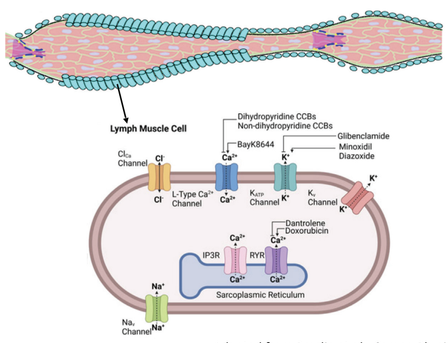
Damage to lymphatic networks (e.g. lymph node dissection, radiation therapy) → Lymphatic vessel pumping dysfunction, fibrosis → Edema, skin thickening → Limited mobility, pain, skin infections



Immune and pump function modulators could be used in lymphedema



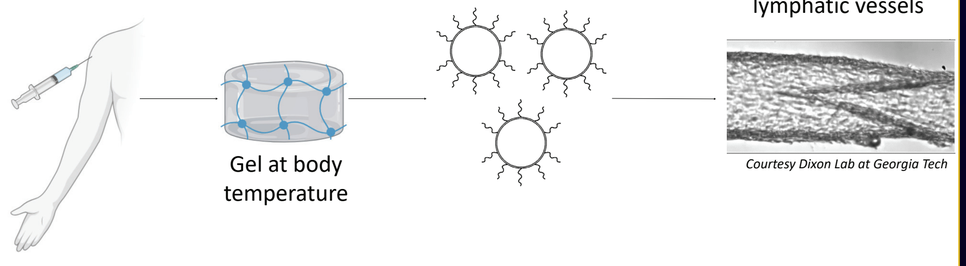
Collecting lymphatic vessel



Adapted from Breslin et al., Compr. Physiol. 2019 and Pal et al., Front. Pharmacol. 2022

Thermosensitive hydrogel releases micelles to lymphatic vessels

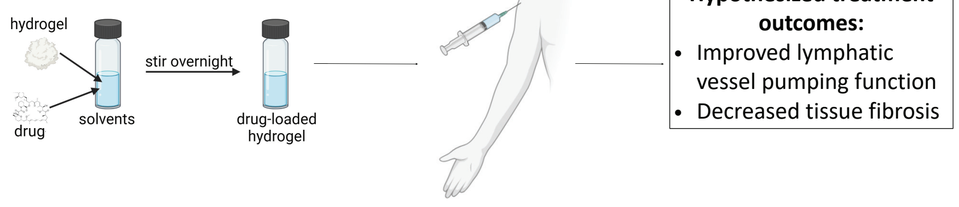
Solution at room temperature for subcutaneous injection → Gel at body temperature → Degradation over 1-2 weeks into 30 nm micelles → Micelles traffic to lymphatic vessels



Courtesy Dixon Lab at Georgia Tech

Sustained lymphatic delivery of drugs to treat lymphedema

Load hydrogel with drugs for lymphedema → Treatment



Hypothesized treatment outcomes:

- Improved lymphatic vessel pumping function
- Decreased tissue fibrosis

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