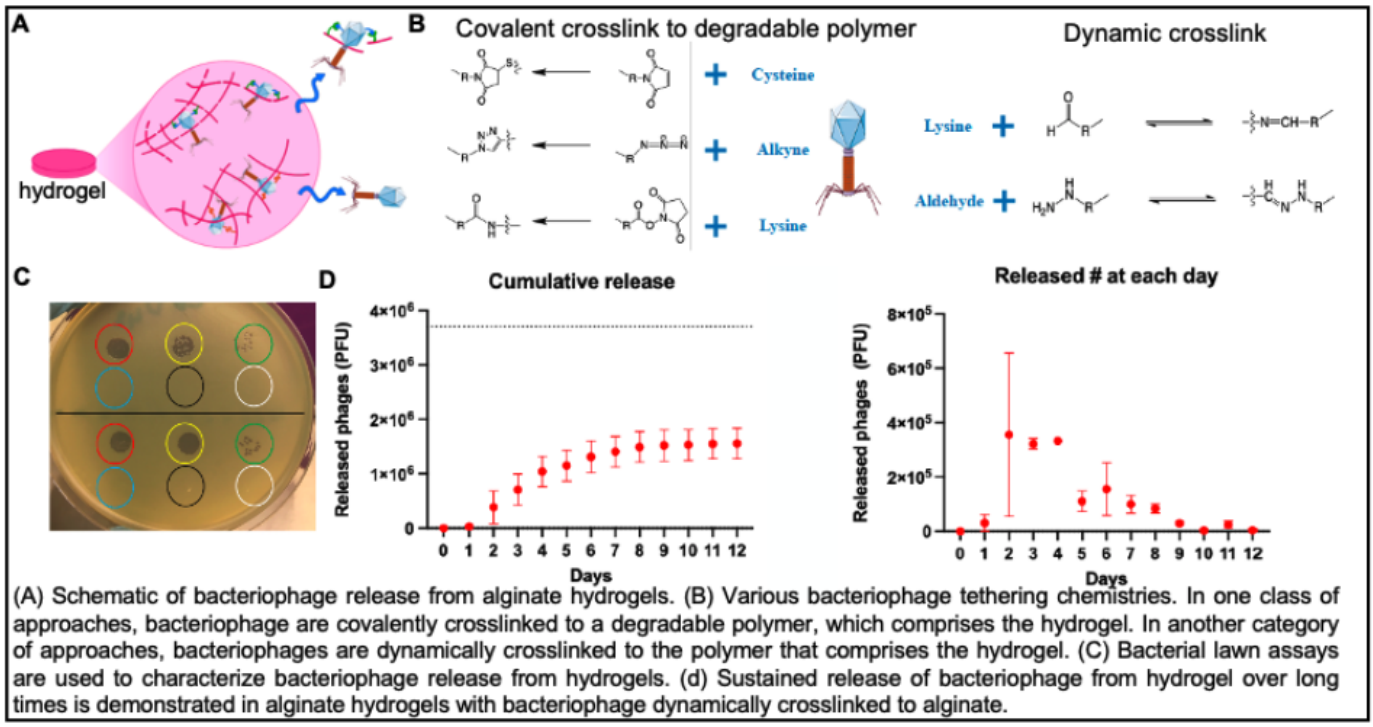
Docket #: S20-117

Controlled Release of Bacteriophage to Treat Implant Infections

Stanford researchers have designed hydrogels that can be delivered to surgical sites in a patient's body for controlled and sustained release of bacteriophages to treat or prevent bacterial infections. This invention includes the hydrogel, a method for chemically binding the bacteriophages to the hydrogel, and a mechanism for sustained release of the bacteriophage over long times (from hours until up to a week). Additionally, the hydrogel containing the phages is not part of an implant but is an independent device. This device is being designed to be deployed locally (through injection or implantation) to treat bacterial infections therapeutically.

Figure



(A) Schematic of bacteriophage release from alginate hydrogels. (B) Various bacteriophage tethering chemistries. In one class of approaches, bacteriophage are covalently crosslinked to a degradable polymer, which comprises the hydrogel. In another category of approaches, bacteriophages are dynamically crosslinked to the polymer that comprises the hydrogel. (C) Bacterial lawn assays are used to characterize bacteriophage release from hydrogels. (d) Sustained release of bacteriophage from hydrogel over long times is demonstrated in alginate hydrogels with bacteriophage dynamically crosslinked to alginate.

Image credit: All Innovators

Stage of Development

- Preliminary data

Applications

- Treatment and prevention of bacterial infections at surgical sites, wounds, or any other localized infection.

Advantages

- Bacteriophages have tremendous potential for treating bacterial infections, particularly those that are antibiotic resistant.
- **Controlled release of bacteriophages**
- **Sustained release** of bacteriophage over at least 7 days
- **Hydrogel can also deliver phage cocktails and other agents**
- **Independent implant** - gel is an independent implant in its own right
- **New paradigm in implant-associated infection treatment**

Patents

- Published Application: WO2022204722
- Published Application: 20240173370

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