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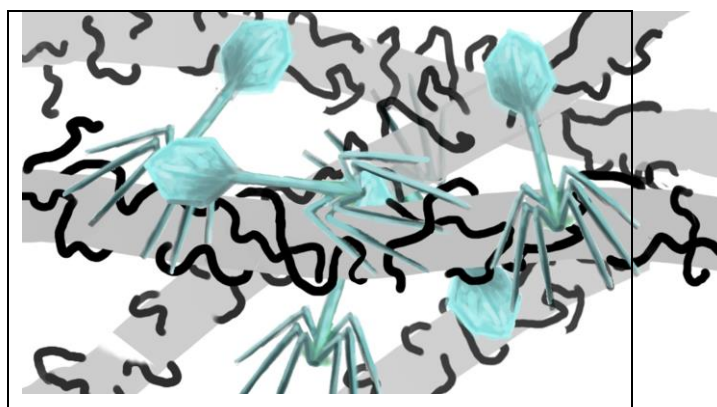
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Graphical Abstract:**Highlights:**

- > In this study thin regenerated cellulose films were prepared by hydrolysis of cellulose acetate.
- > Polyethylenimine and virus adsorption onto the films was studied by QCM-D.
- > A regular growth of the PEI films was observed upon successive increases of the PEI concentration.
- > The adsorption of T4D bacteriophages are 15-fold more efficient onto the PEI-treated film.
- > PEI-functionalized cellulose-based highly improved the airborne virus affinity.

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