

PHOTOTHERMAL DISINFECTION OF N95 RESPIRATORS

[Jun, Young-Shin, Singamaneni, Srikanth](#)

[Markiewicz, Gregory](#)

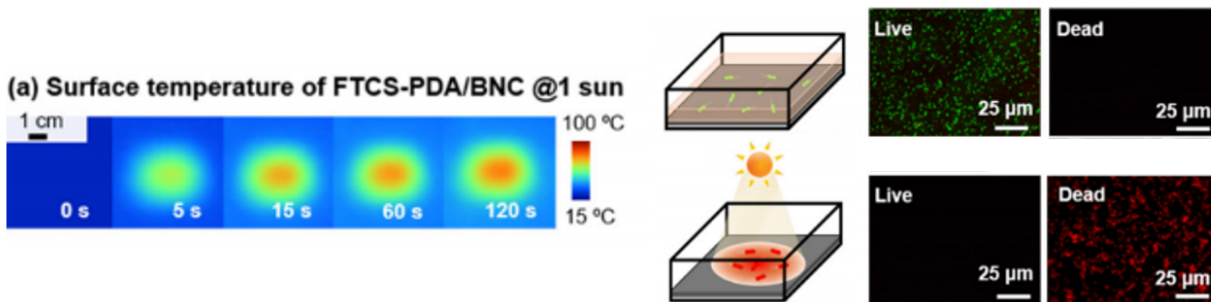
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Technology Description

A team of researchers led by Young-Shin Jun have developed a polymer coating for N95 respirators that would permit fast, easy, and cheap N95 disinfection using only direct sunlight. The researchers coated the outermost fabric layer in polydopamine, which converts photon energy into heat as a disinfectant.

Once the initial fabrication is complete, the N95 respirator can be periodically exposed to direct sunlight to generate surface heat capable of killing microbial contaminants. Because the surface temperature increase is not high enough to cause damage to the respirator, this sunlight disinfection can be repeated an unlimited number of times, converting a single-use N95 respirator into a reusable product.

Stage of Research



The inventors found that, within 20 seconds of direct sunlight exposure, their fabric coating reached temperatures that would inactivate the SARS-CoV-2 virus in 5 minutes. These results were confirmed using *E. coli* as a model, as it tolerates similar temperatures.

Applications

- Personal protective equipment (PPE)
 - All populations during COVID-19 pandemic
 - Health care workers on ongoing basis

Key Advantages

- Simple, cheap, and rapid disinfection process
- Disinfection does not damage respirator, allowing for unlimited reuse

Patents: Pending

Related Web Links: Jun [Profile](#) & [Lab](#), Singamaneni [Profile](#) & [Lab](#)