

Curie Biotech

Production of face masks that can “isolate and kill” COVID-19 with 99.98% effectiveness

Important problem

- COVID-19 continues to have a devastating impact on the world. As of writing, the virus has infected over 118 million people globally, resulting in more than 2.6 million casualties
- Masks continue to remain the first line of defense against infection. Research has shown, however, that conventional masks themselves do not completely protect wearers from infection and do not kill the COVID-19 virus.

How our solution works

- Our team has developed a polymer that, when applied to surfaces like conventional masks, has the ability to “isolate and kill” the COVID-19 virus with 99.98% effectiveness, by taking advantage of the COVID-19 virus’ negatively charged spike proteins.
- Our polymer is a positively charged substance that contains a positive charge strong enough to rip the virus’ protein chain, creating a hole in the virus’ cell envelope, thereby destroying the virus.
- The charge is also stable enough such that it can withstand all types of deteriorating conditions brought on with time and transportation. It can withstand temperatures up to 572 degrees Fahrenheit.
- Our polymer’s COVID-19 killing properties were confirmed through a study conducted by Tampere University in Finland. Researchers compared Curie’s polymer against several controls – including an ordinary tissue paper, an FFP2 filter, and an FFP2 sponge.
- The results showed that compared to these controls, the Curie-enhanced material significantly decreased viral load (from 50,000 PFU to 2-5 PFU within 5 minutes).

Competitive advantages

- **Speed of virucide:** Our Curie polymer can kill the virus – and kill it fast. This is critical, given that viral transference from a conventional mask is likely high, particularly when the wearer temporarily takes off their mask to eat or drink.
- **Applicability to other viruses:** Our Curie polymer can kill viruses that possess a lipid envelope structure and capsid structure like HCoV-229E and Coxsackievirus.
- **Price:** Despite the added “isolate and kill” function of our mask, our pricing is competitive with conventional masks in the market.
- **Safe for human exposure:** Our polymer’s main ingredient is a World Health Organization food additive. Our products do not use toxic metals such as Zinc, Silver or Titanium, in our formulation.
- **Biodegradable:** Our polymer is 100% biodegradable, and causes no environmental damage.
- **Ease of deployment:** Our polymer is a high density and homogenous liquid, which can be deployed easily through a simple loading method over different material surface.
- **Ease of scaling:** Our speed of fabric processing can reach 80 meters/min. We are well-equipped to scale up production to fulfill market demand.
- **Compliance against existing standards:** Our masks have secured a wide range of certifications, from ASTM F2100 Level 3 to EN149 FFP3 NR.