

Antiviral face masks: Industrial experience

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Next generation mask – Swiss HighTech Inovation
21. Sept. 2020



livinguard



Agenda

General Introduction
What is Livinguard Technology?
Permanent Disinfection
Livinguard Antiviral face masks
Testimonies

Our Three Core Beliefs



Power of Permanent Hygiene



Commitment to Sustainability



Investment i



What is Livinguard Technology?

Permanent disinfecting of surfaces

- Non-leaching, non toxic
- Washable
- Broad coverage of microorganisms
 - Bacteria (gram+/gram-)
 - Viruses (including Coronavirus)
 - Fungi

Applications



Consumer Hygiene

Example products

/ Laundry additives / Cleaning wipes /
/ Sanitary pads /



Healthcare & PPE

Example products

/ Medical textiles / Gloves
/ Respirators / Face Masks /



Apparel

Example products

/ Base layers / Socks /
/ Shoe linings /



Plastics

Example products

/ Cell phone accessories /
/ Keyboards /



Drinking Water

Example products

/ Water bottle filters / Tabletop filtration jugs /
/ Community water filters /



Paper

Example products

Tissue paper / Packaging /
/ Wallpaper /



Air Purification

Example products

/ Complete HVAC filters /
/ Air filtration media /



Industrial & Others

Example products

/ Transportation upholstery / Automotive filtration /
/ Duck feather bedding /

imagine textiles
that needs 6 times
less washing. even
without detergents.



livinguard

imagine hygiene,
wherever you go.



livinguard

imagine cleaning and
disinfecting surfaces
in a single swoosh.



livinguard

imagine odor free
socks.



livinguard

imagine a world of
public safety.



livinguard

imagine a deep
clean everytime
you remove your
makeup.



livinguard

imagine hygienic and
odor free apparel,
inside and outside.



livinguard

imagine enduringly
hygienic textiles, no
matter the splash.



livinguard

imagine industrial
and microbial
protection.



livinguard

CSR activities



Safe water without electricity.



Affordable and environmentally sustainable menstrual hygiene.

We are
a global company



Santa Cruz, USA



Würzburg, Germany



Zug, Switzerland



Tokyo, Japan



Mumbai, India



Singapore



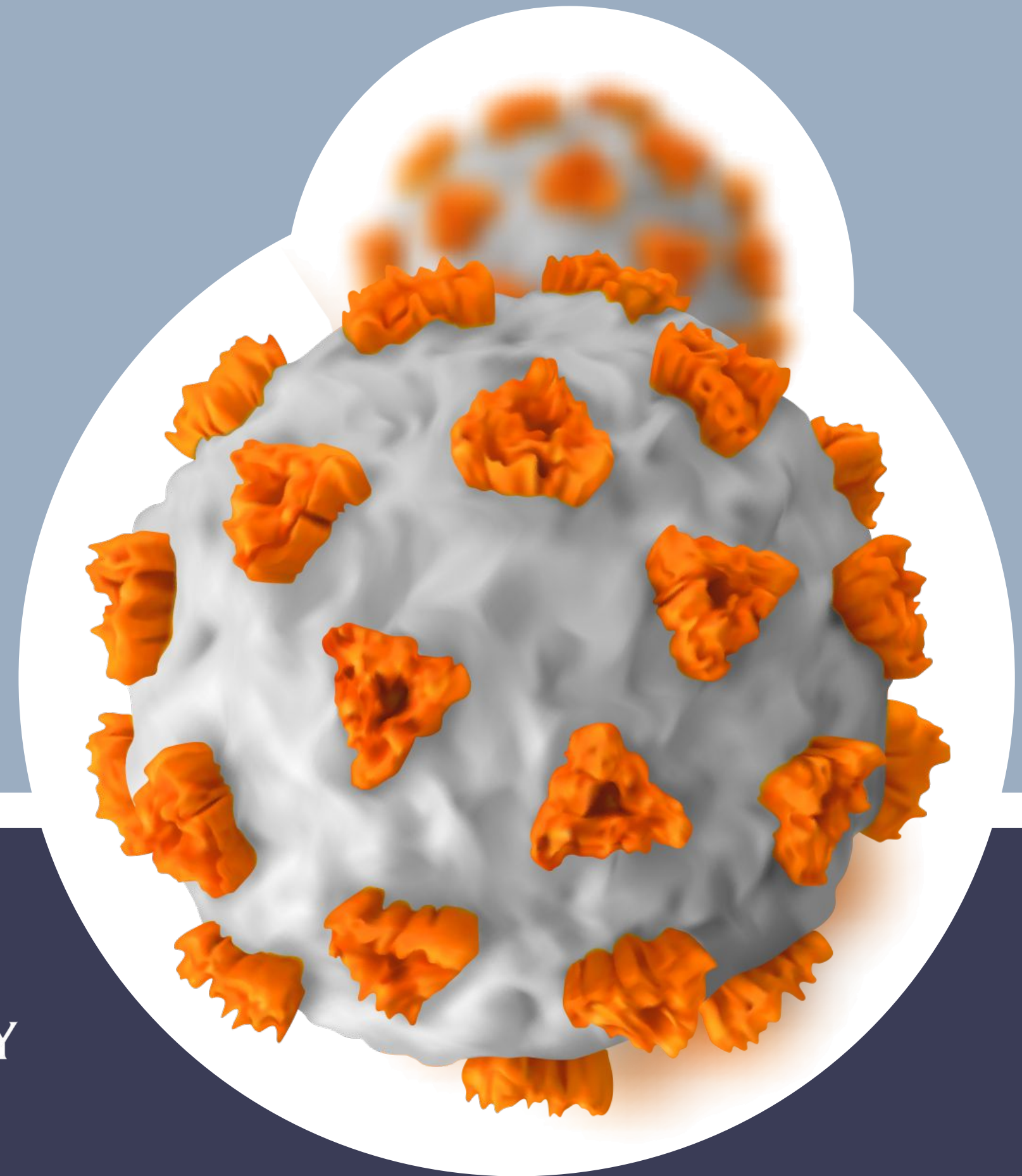
Cape Town, South Africa



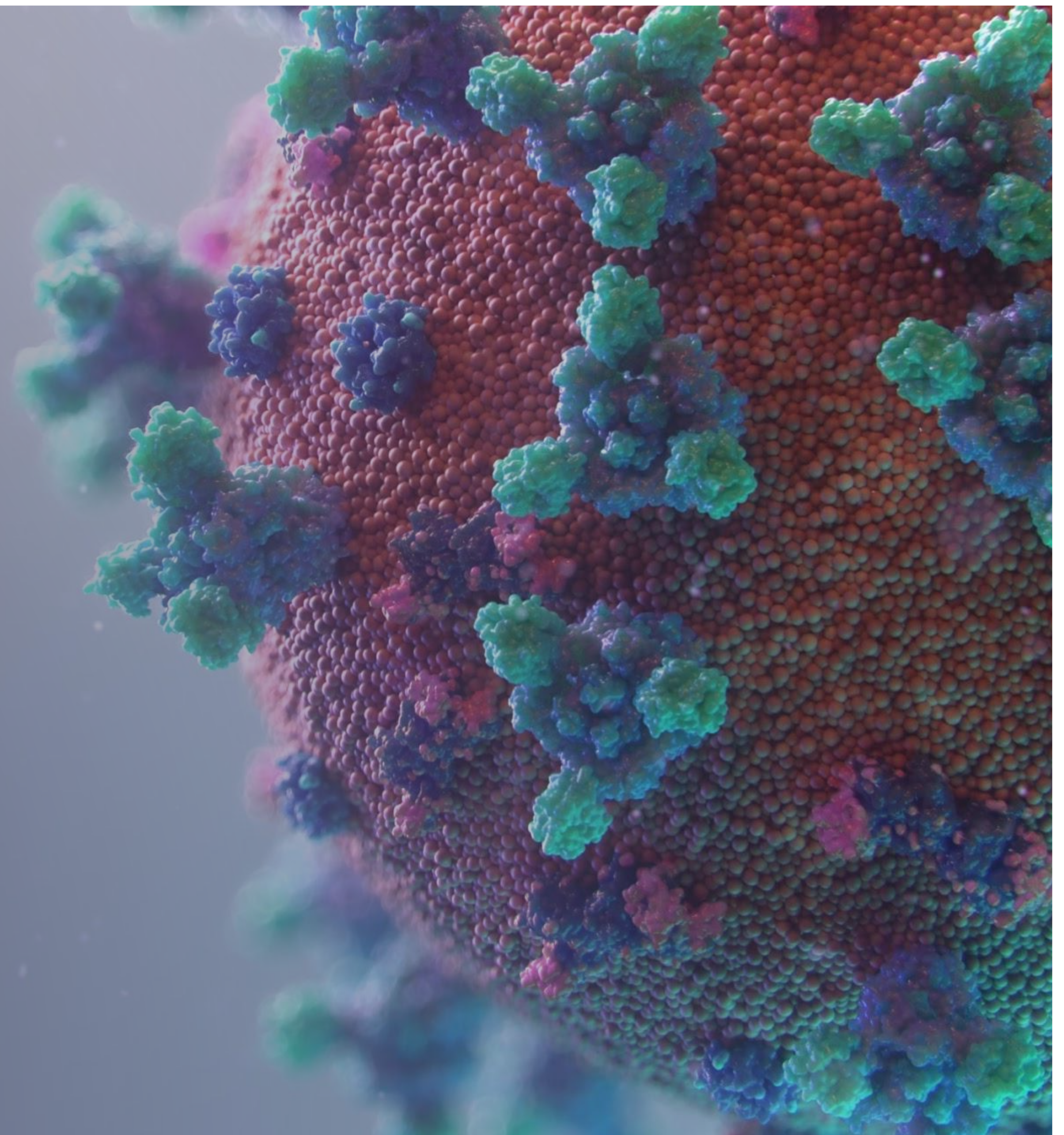
Permanent disinfection

Livinguard Technology scientifically proven to destroy > 99.9% of SARS-CoV-2.

- The University of Berlin (Institute for Animal Hygiene and Environmental Health) and RWTH Aachen University have shown that textiles treated with Livinguard Technology can destroy >99.9% of SARS-CoV-2 (the virus that causes COVID-19).
- Human coronavirus 229E inactivation has been shown by Dr. Charles Gerba at the University of Arizona, Tucson.



How does Livinguard Technology work?



The only permanent self-disinfectant



Destroys bacteria and viruses including SARS-CoV-2

Effective against a wide range of microbes
(incl. MRSA, influenza, TB and more)



Physical disruption of cell membrane

No poisoning
- no development of resistance possible



Metal free & permanent (non-leaching)

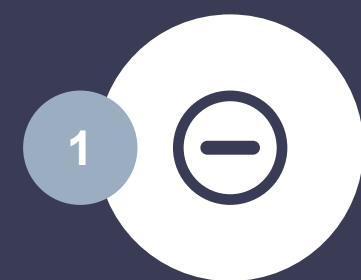
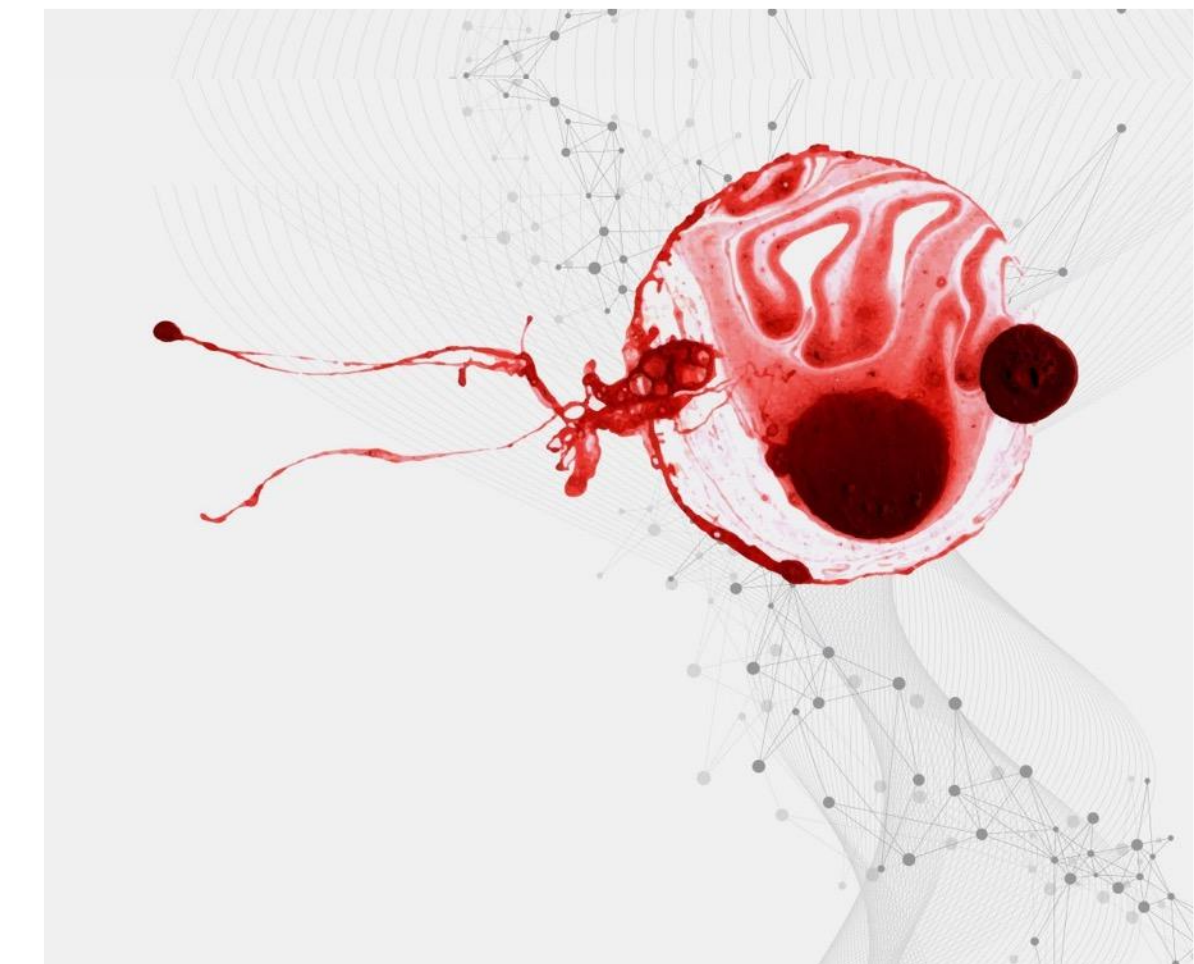
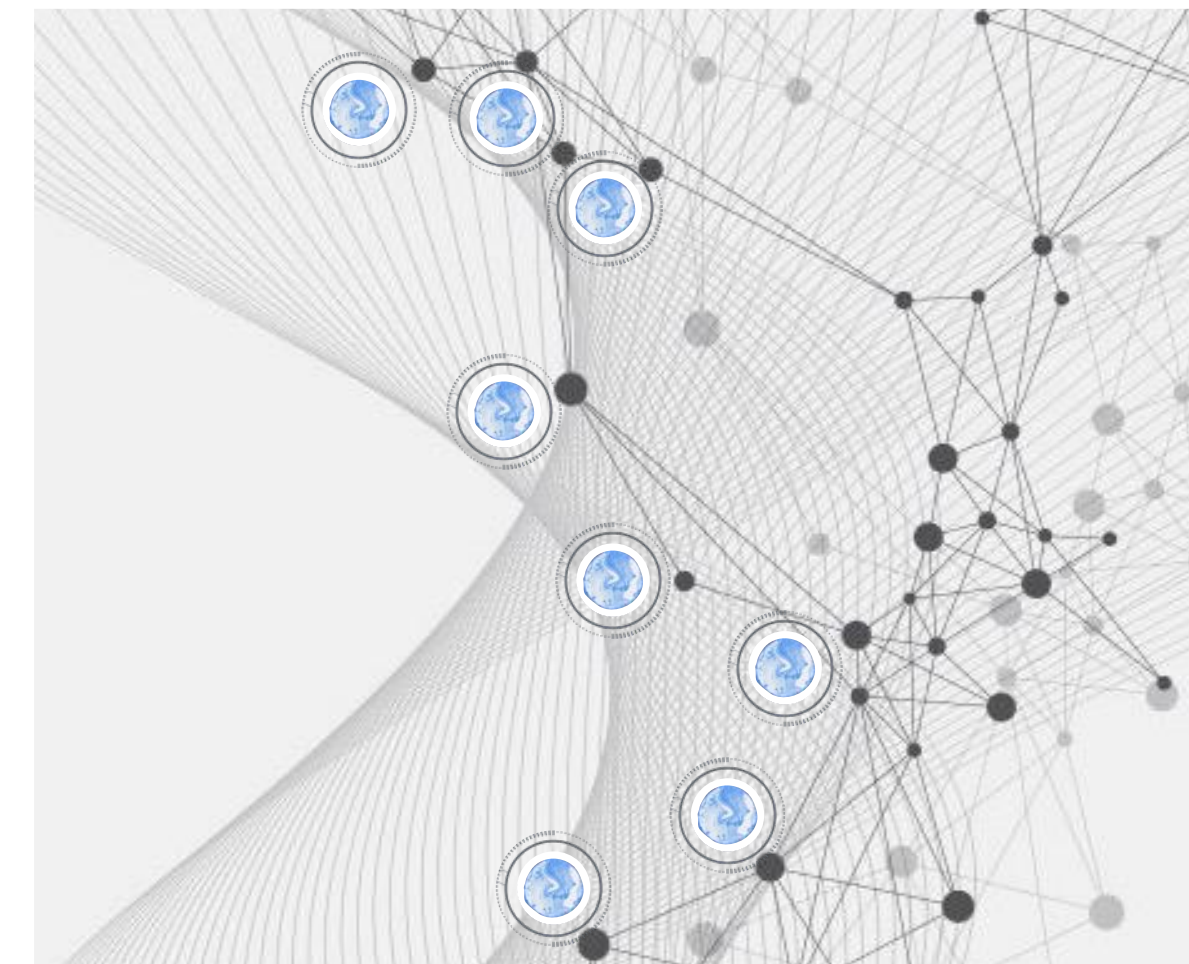
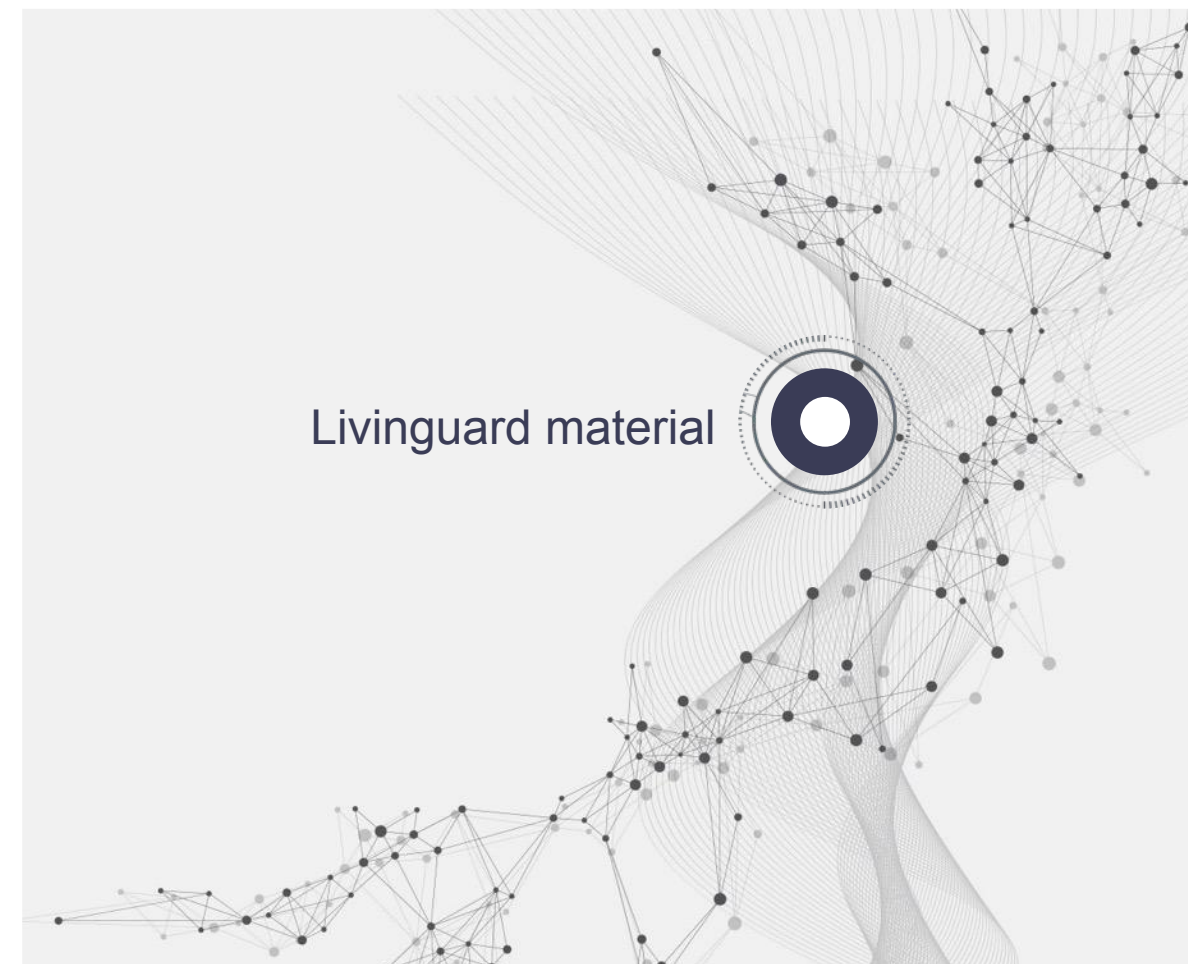
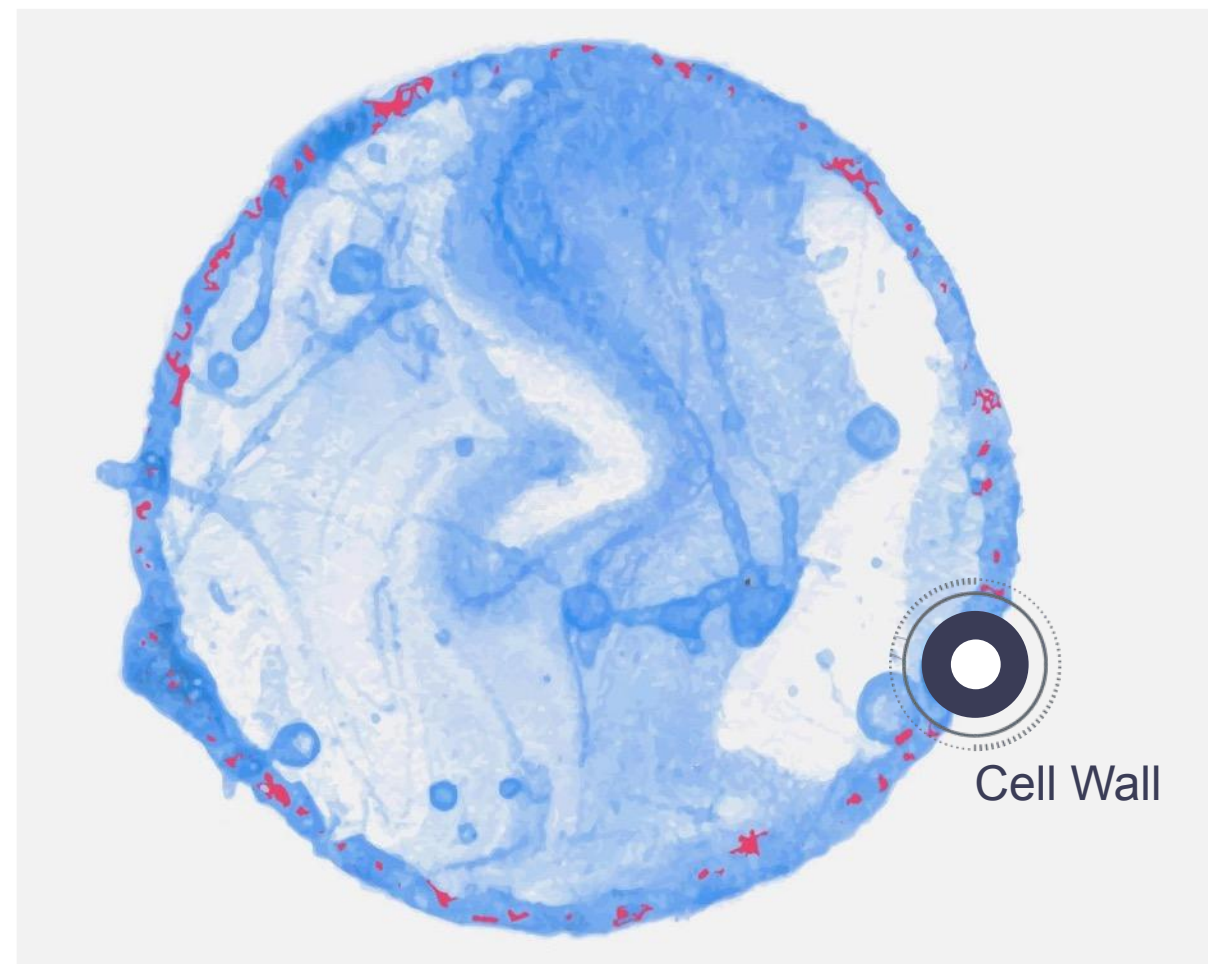
Not based on silver or other metals
that leach into environment



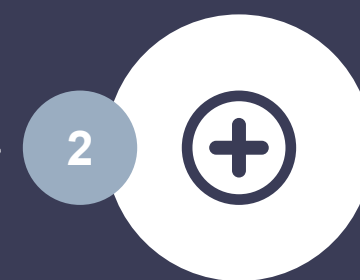
Non-toxic & skin safe

Passes GLP standards:
P328, P322.RAT & P326

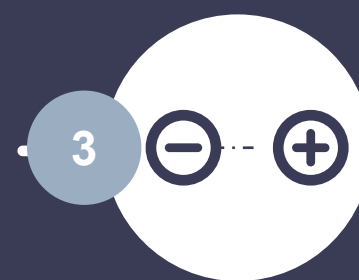
How the Livinguard technology works



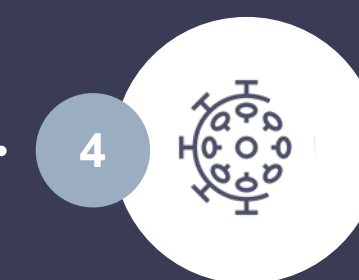
All microbes
(bacteria, viruses & fungi)
have negatively charged cell walls



Livinguard treated materials
contain strong positive charges -
24 billion positive charges per cm²

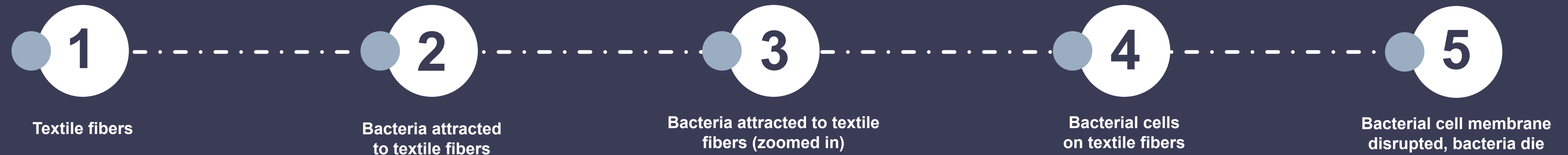
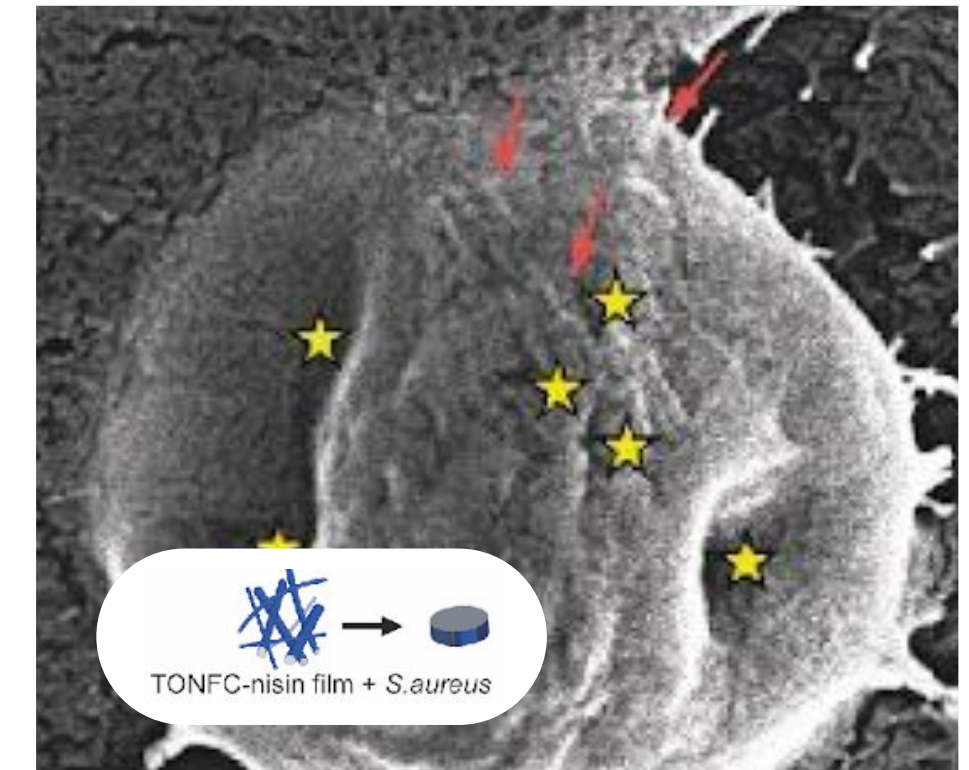
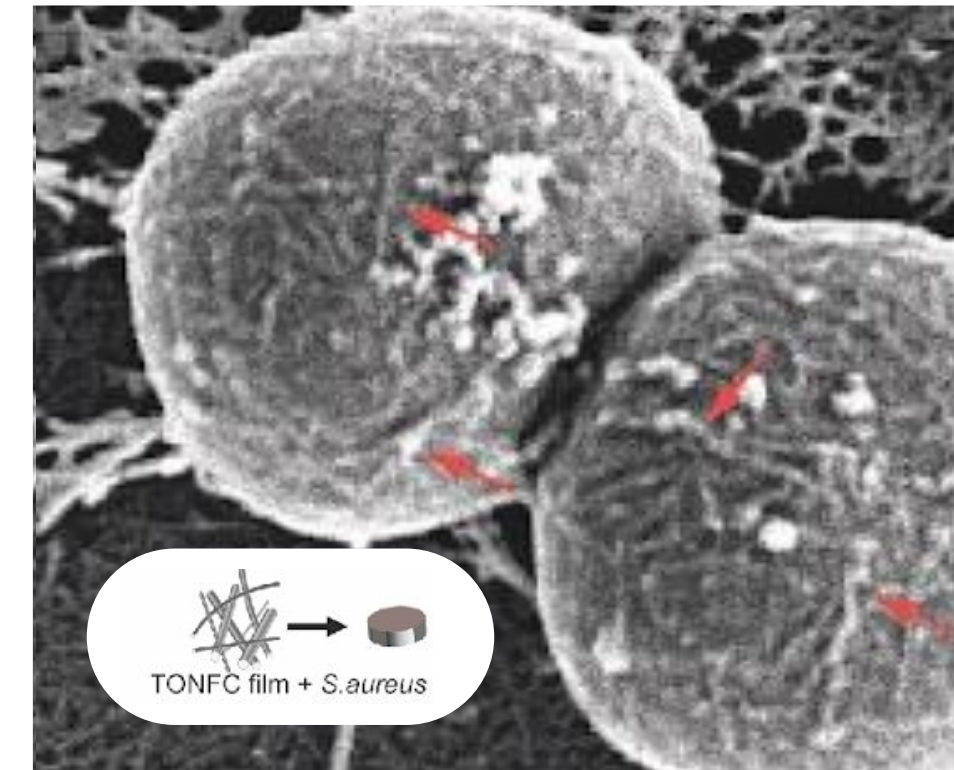
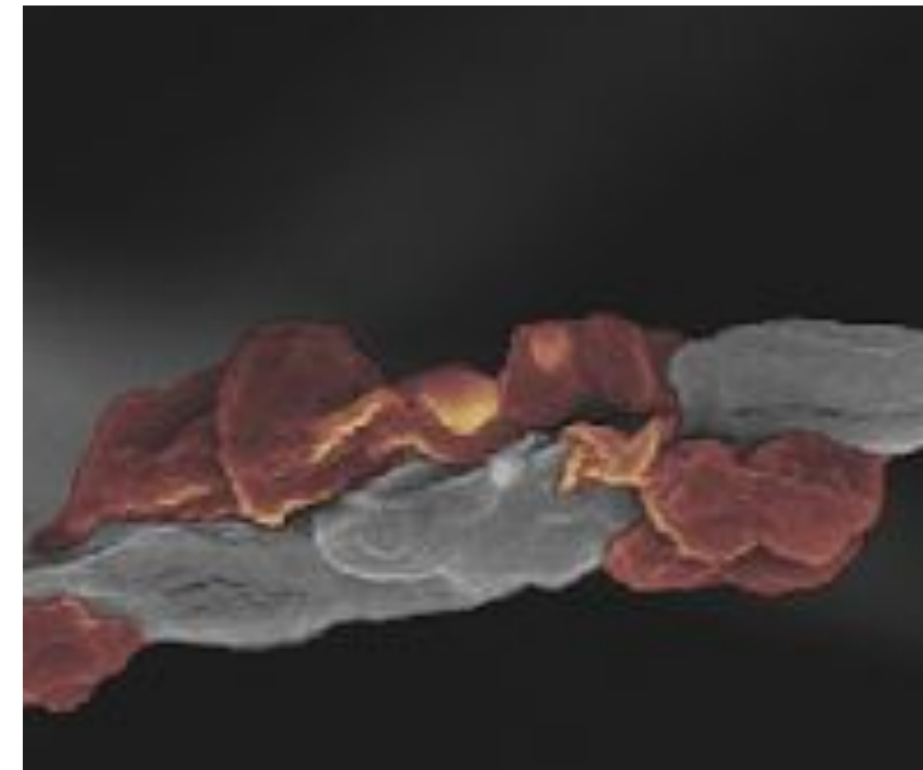
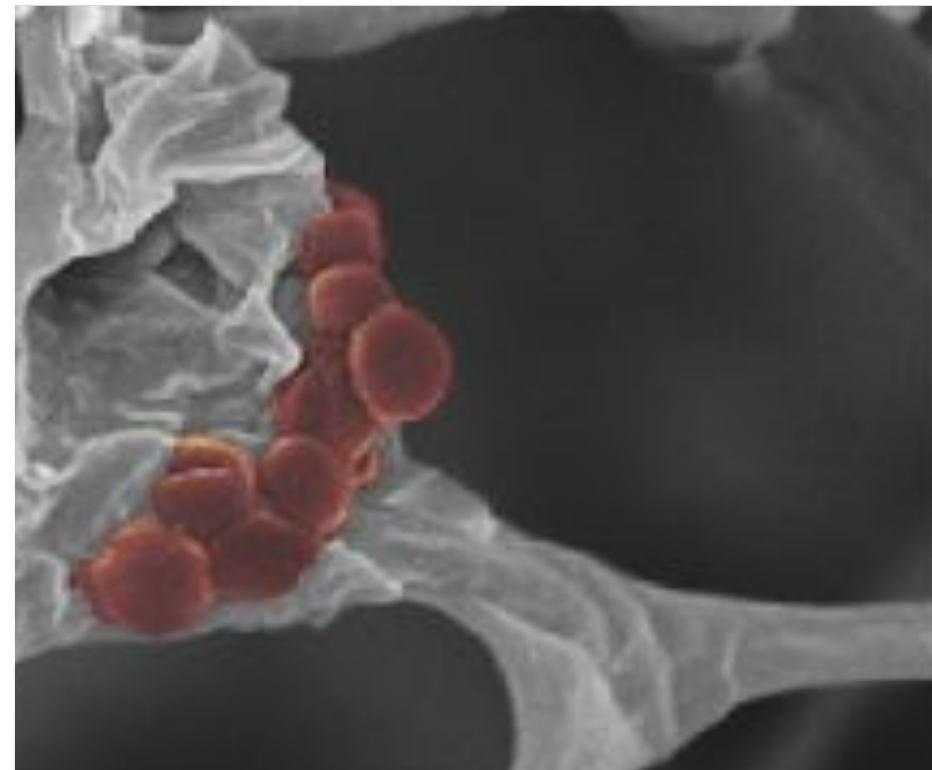
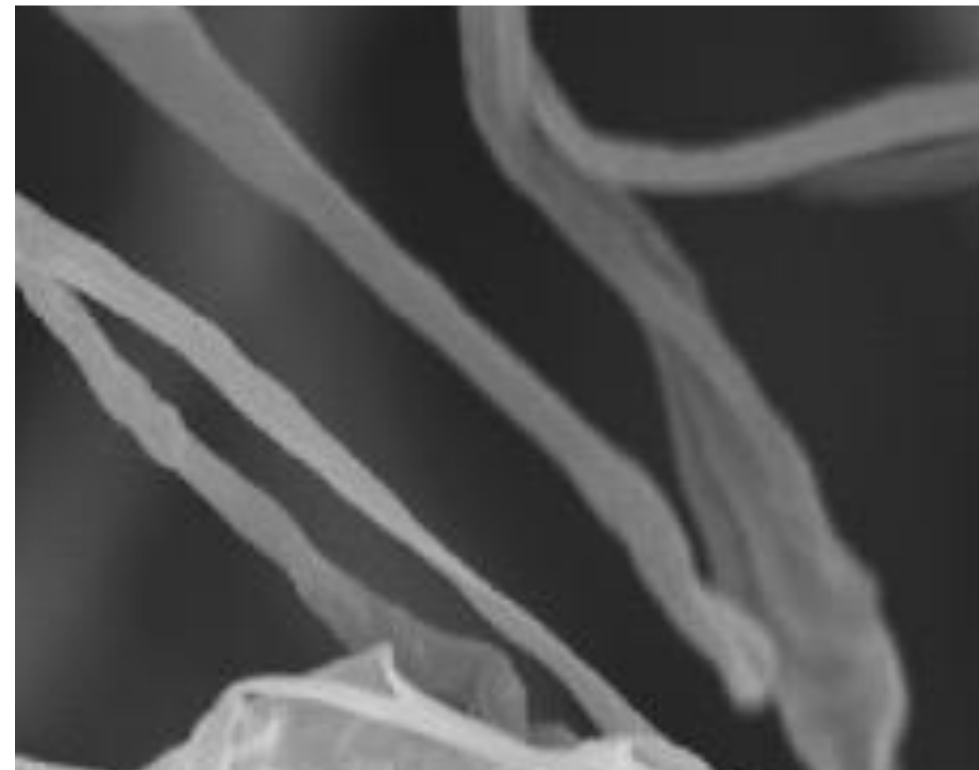


The negatively charged cells are
drawn towards the positively
charged surface.



Upon contact, the negatively charged
compounds in the cell wall are absorbed onto
the positively charged surface.
These compounds are drawn out of the wall,
resulting in holes and disruption of the
membrane

Inactivation of bacteria due to disruption of cell membrane



A similar mechanism applies for virus inactivation:

1

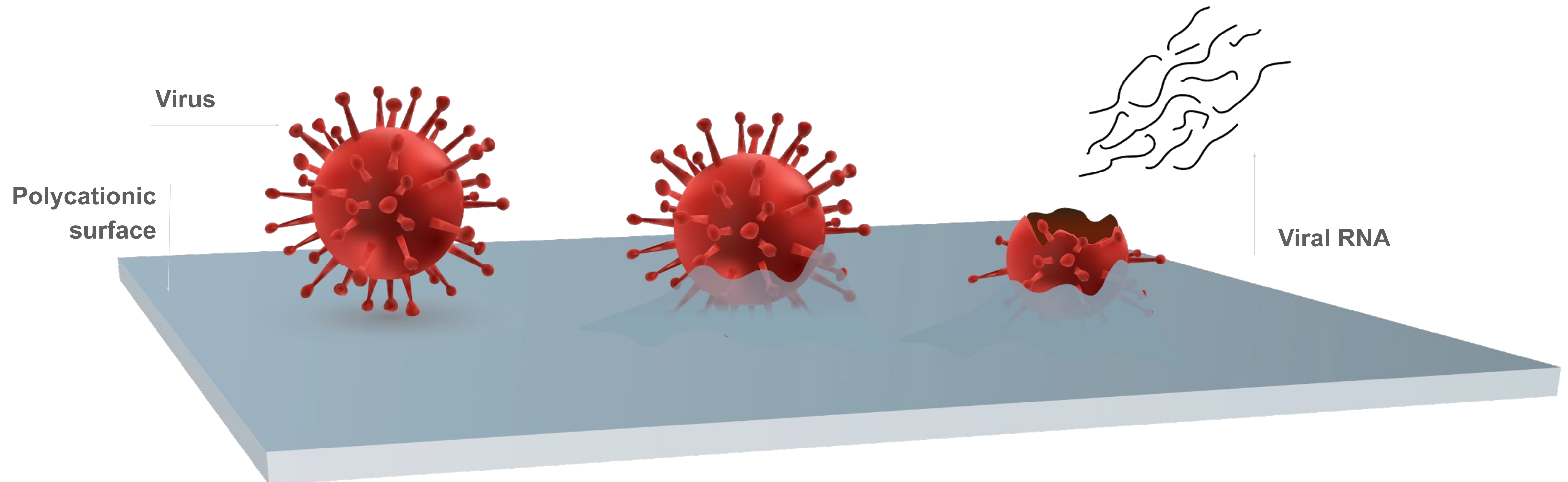
Diffusion to
surface

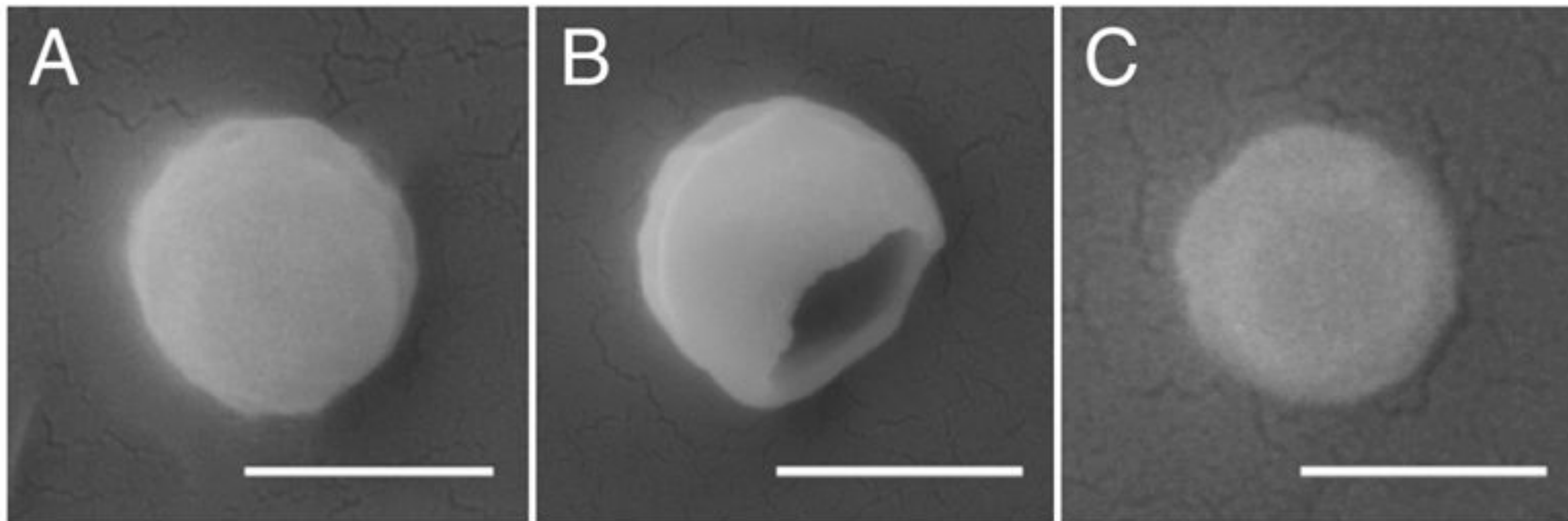
2

Adherence to
polycationic
surface

3

RNA leakage
and virus
inactivation





Influenza virus - surface inactivation

Livinguard Technology used for Livinguard Masks

**destroys 1,000,000 times more than
the viral load of a sneeze**

Tests performed by Free University Berlin proving the destruction of >99.9% SARS-CoV-2 used a viral load more than 1,000,000 times greater than that of a sneeze on a mask.

The Livinguard Mask has replaced the equivalent of
3 billion single use masks globally.



Livinguard Face mask

Various partners worldwide

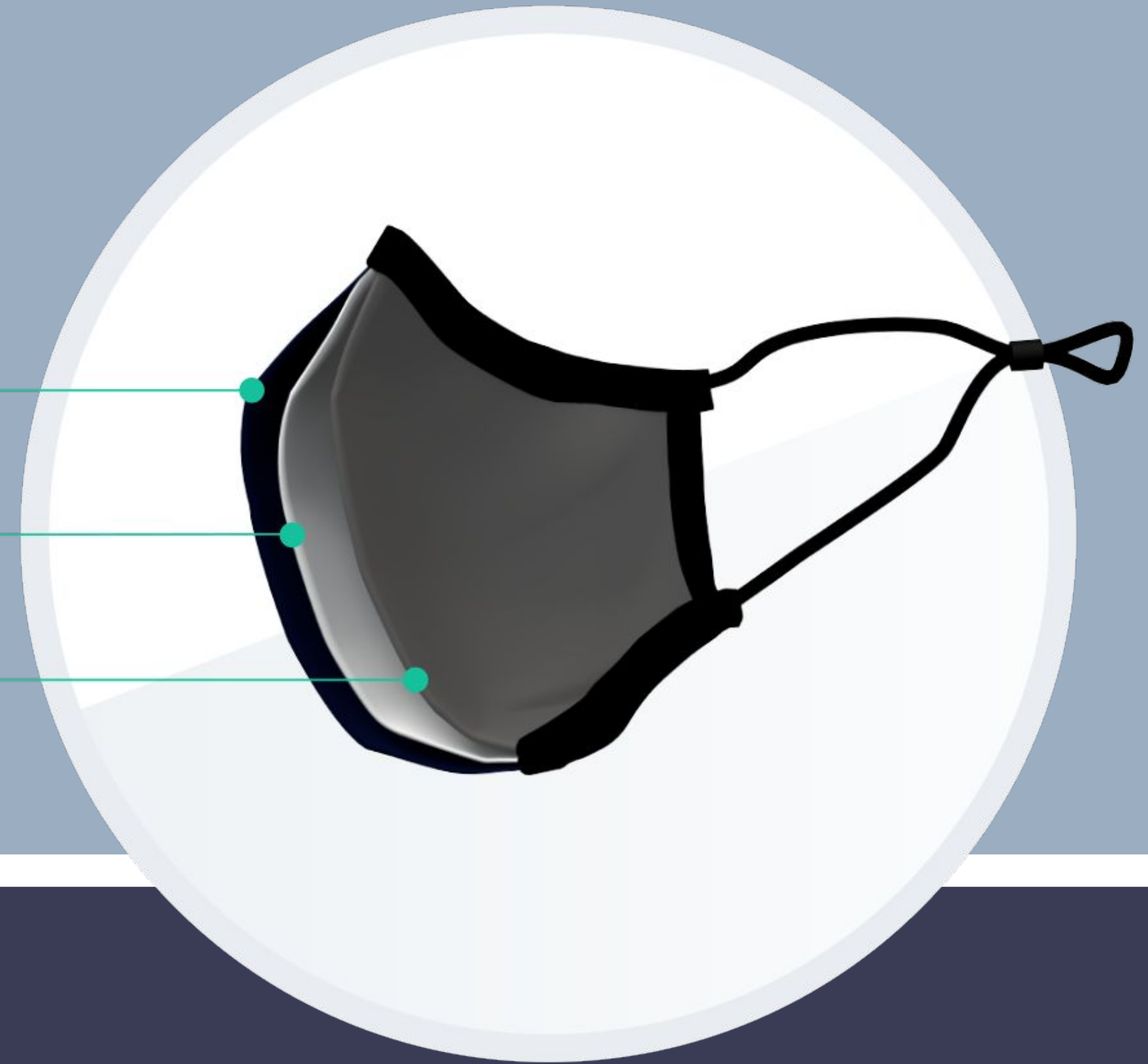
For Switzerland:

- Cilander AG
- Schoeller AG

Outer layer
3 levels of protection

Middle layer
filters continuously

Inner layer
protects comfortably



Beobachter





Von den zwölf getesteten Masken schützt die Hälfte nur mangelhaft

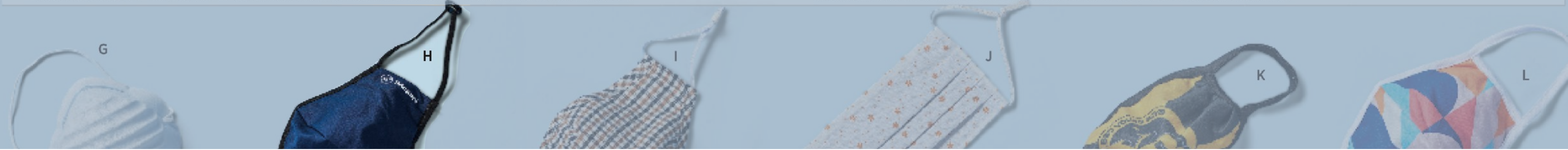
Bewertung nach Schulnoten



	Wegwerfmasken							Waschbare Masken				
	Tect-Atemschutzmaske	3M-Atemschutzmaske K111	Hygienemaske	Mund-Nasen-Bedeckung	Hygienemaske	Atemschutzmaske HG	Mund-Nasen-Schutz	Livinguard-Stoffmaske Pro	Gesichtsmaske mit Filter	Selbstgemachte Maske	YB-Maske	Atemschutzmaske mit Filter
Maske	A	B	C	D	E	F	G	H	I	J	K	L
Schutzklasse	FFP2	FFP1 – mit Ventil	EN 14683 Typ IIR	keine	keine	KN95	keine	FFP1	keine	keine	keine	EN 14683 Typ I
Schutzversprechen	94%-Abwehrquote bei Aerosolen	80%-Abwehrquote bei Aerosolen	medizinische Gesichtsmaske	kein Medizinprodukt	Bakterienfilterwirkung bis 99%	95%-Abwehrquote bei Aerosolen	keine persönliche Schutzausrüstung	80%-Abwehrquote bei Aerosolen	aus Baumwolle	aus Baumwolle	kein Medizinprodukt	medizinische Gesichtsmaske
Gekauft bei	Migros Do It + Garden	OBI Baumarkt	Coop Bau + Hobby	Selecta-Automat	Lightinthebox.com (China-Shop)	Galaxus.ch (Migros)	OBI Baumarkt	Cilander.ch	Löwen-Apotheke, Bahnhofstr., Zürich		BSC Young Boys Fanshop	Superfox.ch
Preis pro Stück in Franken ¹	6.65	5.95	1.20	1.50	0.97	4.89	0.40	34.90	15	keine Angabe	9	9.40
Produktionsland	China	Türkei	China	keine Angabe	China	China	China	Portugal	keine Angabe	Schweiz	China	Bulgarien
Note Aerosol-Abwehr (Filterung in %) ²	6 (100%)	6 (99%)	4 (86%)	4 (82%)	3,5 (75%)	2,5 (44%)	1 (5%)	4,5 (93%)	3 (52%)	1 (20%)	1 (9%)	1 (7%)
Note Tröpfchen-Abwehr (Filterung in %) ²	6 (100%)	6 (100%)	6 (99%)	5,5 (98%)	5,5 (97%)	4,5 (87%)	1 (9%)	6 (100%)	5 (94%)	3,5 (61%)	1 (15%)	1 (12%)
Luftdurchlässigkeit ²	4,5	5	5	5,5	5	5	6	4	4	3,5	6	6
Mängel		Ventil ³		Tragekomfort ⁴			Tragekomfort ⁴		Waschbarkeit ⁵			
Gesamtnote ²	5,7	4,8	4,6	4,1	4,2	3,4	1,5	4,7	3,1	2	2	2
Gesamturteil	sehr gut	gut	gut	genügend	genügend	ungenügend	schlecht	gut	ungenügend	schlecht	schlecht	schlecht

Als Aerosole wurden Partikel mit einer Grösse von 0,3 Mikrometern gemessen. Das entspricht dem Virus, das von getrocknetem Lungenschleim umhüllt ist. Als Tröpfchen gelten im Test Partikel mit einer Grösse von 1 Mikrometer. Das entspricht kleinen Tröpfchen, die beim Sprechen entstehen.
¹ Versandkosten allenfalls inklusive. ² Gewichtung: Aerosole 60%, Tröpfchen 20%, Luftdurchlässigkeit 20%.
³ Ganze Note Abzug: Ein Ventil schützt nur den Maskenträger, nicht aber die anderen Menschen, die sich im Raum aufhalten.

⁴ Halbe Note Abzug: Anpassung an Gesichtsform, Geruch, Schweißbildung beim Tragen.
⁵ Halbe Note Abzug: Masken müssen bei mindestens 60 Grad waschbar sein, damit Viren nicht mehr aktiv sind. Wenn die Maske bei einer 60-Grad-Wäsche schrumpft, ist sie nicht wiederverwendbar.
Quelle: Fachhochschule Nordwestschweiz (FHNW)/Institut für Sensorik und Elektronik/«Gruppe Partikelmesstechnik»





Scientific collaborations

- University of Arizona
- Free University of Berlin
- RWTH Aachen
- University of Fribourg
- University Hospital Zürich (USZ)
- HES-SO Fribourg
- ABC Laboratory Spiez
- Remask (EMPA)
- ...
- ...

Performance and safety verified by various reputed organizations



World Health
Organization



United States
Environmental Protection
Agency

Product Safety Labs
over 40 years of service

HOHENSTEIN ●

eawag
aquatic research ooo

 **Nelson Labs.**
A Sotera Health company

 **THE UNIVERSITY
OF ARIZONA**

Freie Universität  Berlin

**RWTHAACHEN
UNIVERSITY**

What our customers say...



“Our first tentative steps back.
We start slowly on Monday at
Peddar road....
Guarded by our Livinguard mask”

Eye surgeon



“Thanks to my Livinguard mask, I’m
back at work with my most significant
worry behind me.... protect myself so
that I may keep helping my patients.
Being snug, breathable and reusable
(with minimal care) has made me
believe that the masks I wore earlier
were such a compromise, in
comparison. Please remember that
besides me, a large community of my
patients (and their families) are
indirectly grateful too”

Family Physician



“The Living Guard masks are very
comfortable for prolonged use.
I also use it outside and while driving
to work too”

Restaurant Owner



“Very soft and comfortable fabric.
The ear adjustments are a great idea”

Law enforcement officer



“I chose Livinguard over
conventional masks because it’s the
safest option out there! Since being
faced with this new normal
Livinguard meets my number 1
priority which is protecting myself
and protecting my clients. It’s super
breathable and comfortable that I
even forget I’m wearing it”

Fitness Trainer

What our partners say...



"Our research has proven that the textiles in these masks can continuously inactivate the exhaled viruses and can make handling these masks even safer overall... In addition, such textiles could also help to reduce hygienic issues in other general and medical areas, even beyond COVID-19."

Prof. Dr. Uwe Rösler
Freie Universität Berlin, Institute for Animal and Environmental Hygiene.



"This is very clever. A lot of innovation went into immobilizing this technology onto a surface. It seems very effective. I haven't seen anything as effective on textiles."

Prof. Dr. Charles P. Gerba
Professor of Virology at University of Arizona



"We believe the breakthrough technology of Livinguard is a cornerstone for our company for the decades to come. As the world now becomes more attuned to communicable disease prevention, Livinguard Technology will be an integral part of our plans, not only on wearables such as our Fine Guard Masks, but also gloves, wipes and specialized paper products. The applications are endless and it provides a wonderful opportunity for Fine to dramatically improve the wellness of the world's consumers."

James Michael Lafferty
CEO Fine Hygienic Holding
Leading FMCG brand producing and selling co-branded consumer products



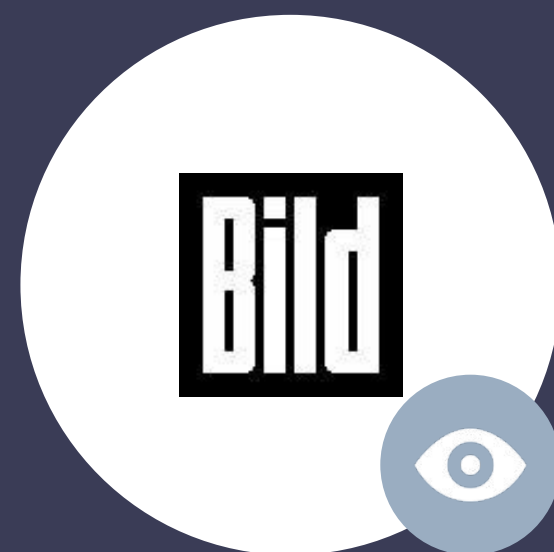
"ReadyOne Industries has been making protective chemical/biological uniforms for the U.S. military for decades and is proud to be able to deploy Livinguard Technology through our products to our military customers, government customers, both large and small corporations and to individual Americans. We look forward to providing the ultimate protection to our valued customers in the Americas and to our continued partnership with Livinguard, as they develop new and innovative solutions that will help prevent illness and improve wellbeing on a global scale."

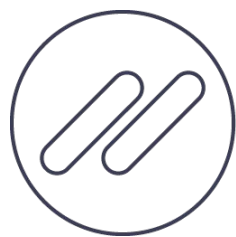
Luis Alvarez
President & CEO ReadyOne Industries
US military contractor taking co-branded mask orders from the US Armed Forces

Attracting attention worldwide

Revolutionary protection at the centre of global news

The Livinguard STREET, PRO, ULTRA MASK as seen on...





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www.livinguard.com

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