



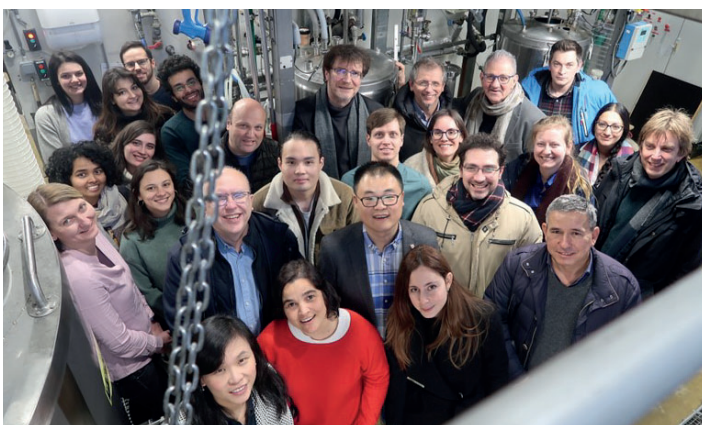
Sustainable nanoPaRticles Enabled antiMicrobial surfaceE coatings

- Textiles
- Metal
- Alloys
- Ceramics
- Tiles
- Marble
- Stone slabs
- Paper
- Cardboard
- Plastics



BREAKING NEWS

Welcome to our first SUPREME Newsletter, created to put you up to speed with the project's news and achievements! For continuous updates, follow us on [LinkedIn](#) and [Twitter](#), or check out our news [website](#) section.



SUPREME Consortium at KU Leuven

January 2023

SUPREME consortium meets full of energy and enthusiasm for its Kick-off Meeting in beautiful city of Gent, Belgium hosted by the coordinator KU Leuven. The 18 partners of the SUPREME European project promise to bring antimicrobial, antiviral, and antifungal nanocoatings to five types of surfaces: textiles, metal & alloys, ceramics, paper & cardboard and plastics.



January 2023

Professor **Zhenyu Jason Zhang**,
co-coordinator of SUPREME project,
wins the 2023 RSC/SCI McBain Medal

(Source: [University of Birmingham](#))

SUPREME coordinators

Professor Zhenyu Jason Zhang (left)
and Professor Jan van Impe (right)

MAIN TOPIC: WHY DO WE NEED COATINGS?

SURFACE COATINGS

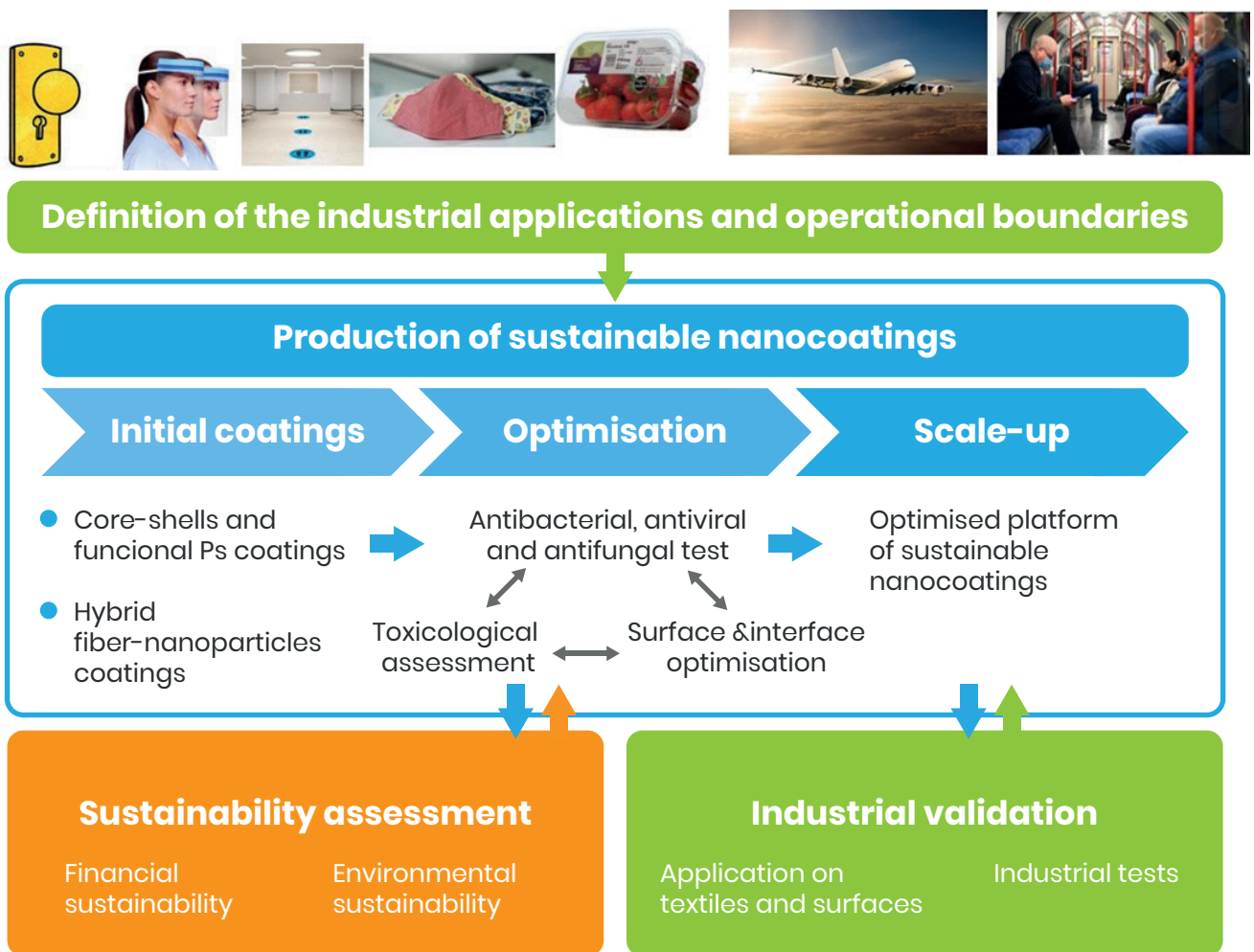
Surface coating, in its broadest definition, refers to a layer of formulated materials applied to a bulk object, aiming to modulate and enhance its surface properties. Coatings are essential to different sectors, e.g. chemical products, advanced manufacturing, healthcare technologies, agriculture, transport. Performance and properties of surface coatings are determined by the coating formulation and processing conditions, for which in-depth understanding, together with operational requirements and supply chain consideration, are crucial.

SUPREME PROJECT

The catastrophic ongoing pandemic has attracted our attention towards the spread of harmful pathogens facilitated by high traffic surfaces, highlighting the importance and urgency of an economically and environmentally sustainable solution for antimicrobial surface as a potential strategy to mitigate the spread of disease outbreaks.

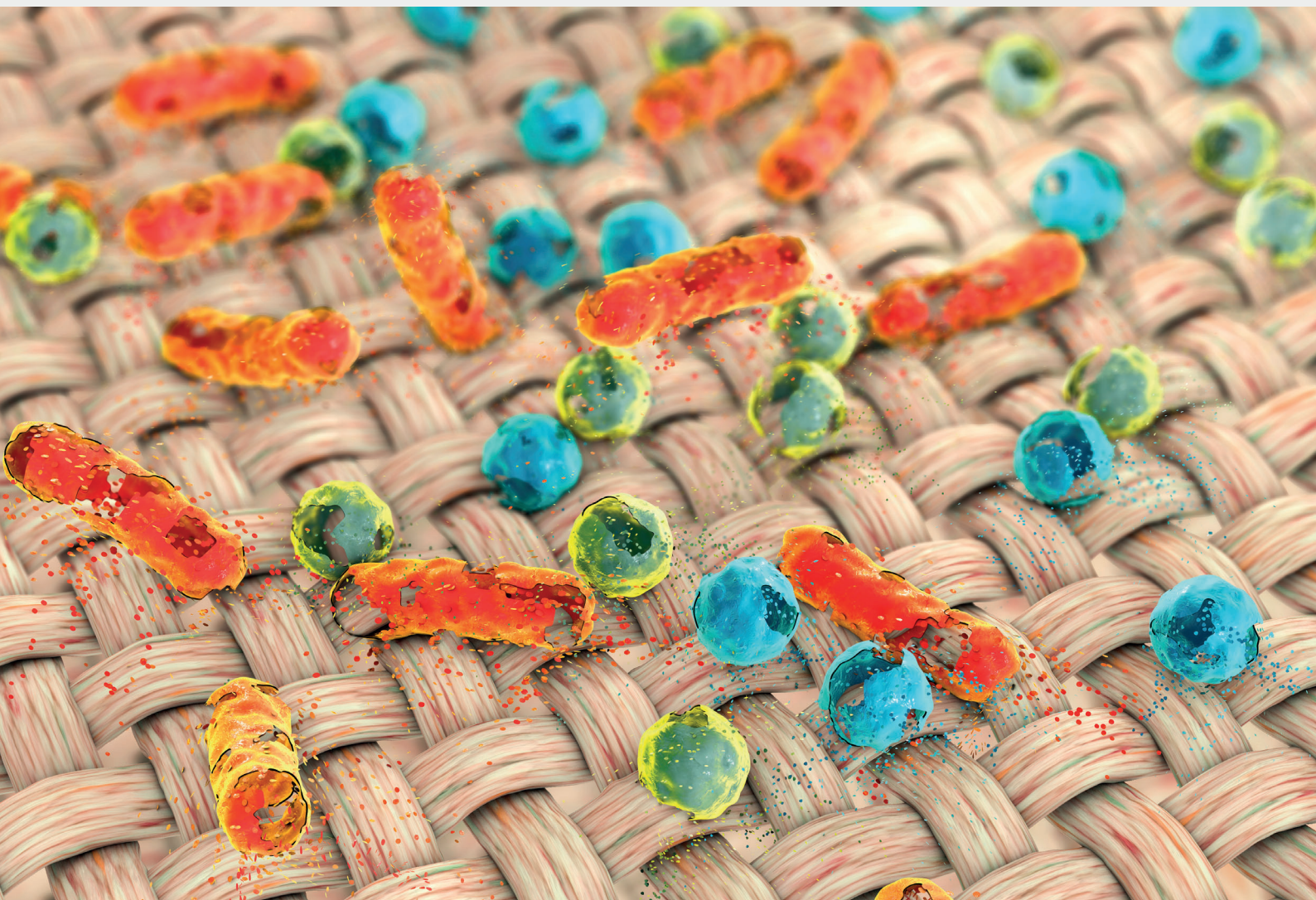
Nanoparticle (NP) filled coatings, with recognised effectiveness against bacteria, viruses, and fungi, are valuable candidates for developing antimicrobial surface and minimising the surface adhesion of pathogens. However, due to the many technical challenges, including difficulty to develop nanocoatings with a long-term antimicrobial capability, durability under real conditions and safety assurance, their application at industrial level is still limited.

The SUPREME consortium will develop a platform of efficient and multifunctional antimicrobial nanocoatings, building upon bespoke TiO₂ nanoparticles that have demonstrated an exceptional antimicrobial ability at lab scale (TRL3). Two sustainable routes: 1) customised core/shell and advanced functional nanoparticles and 2) hybrid fibre-nanoparticles (using sustainable bio-based cellulose materials and nanoparticles) will be pursued. Bearing in mind the specific requirements of individual applications, the SUPREME consortium will coordinate the antimicrobial testings to its effectiveness against a wide range of pathogens. The production of the SUPREME coating will follow a sustainable-by-design approach that considers both toxicity and environmental impact from outset to guarantee both market acceptance and sustainability of the overall process whilst having a robust safety assurance in place for human health. The scaling-up production of these sustainable materials and their validation according to the industrial requirements will enable to reach the TRL6 by the end of the project.



SUPREME overall concept





The SUPREME project aims to develop a platform of efficient, multifunctional and sustainable nanomaterials with a proven antimicrobial efficacy that will be incorporated into different formulations (aqueous, solvent, or powder based) to produce surface coatings. Thorough evaluation of the end applications will guide the consortium to establish the operational boundaries and identify the target pathogens relevant for the final target uses. The antimicrobial, antiviral, and antifungal effectiveness of the coatings against representative pathogens (selected based on the end applications) will be evaluated. The surface adhesion and durability on a variety of surfaces (including textiles, metal & alloys, ceramic, paper, and plastic among others) will be quantitatively investigated, from which the results will be used to further optimise coating formulations. The toxicity of the nanocoatings will be evaluated thoroughly. The scaling-up of the nanocoating production will be accomplished by a joint effort between academic and industrial partners, and validated by end-users from different market segments, i.e., textile, coatings, packaging and construction materials, reaching TRL6. Equipped with a sustainable-by-design approach, the partners are well aligned in producing nanocoating based on efficient nanoparticles and sustainable cellulose fibres - SUPREME will deliver superior and sustainable nanocoatings validated for their efficiency, durability, and safety.



WHAT'S HAPPENING?

What? 	Who? 	Where? 	When? 
SUPREME Kick-off Meeting	ALL	Gent, Belgium	18 - 20.01.2023
Stand and presentation "Wellness in Energy Efficient Buildings" at <u>Energy Efficiency in Buildings Conference</u>	PCN	Athens, Greece	04.04.2023
Participation in the <u>12th NanoSafety Training School 2023</u>	WU	Venice, Italy	15 - 19.05.2023
Stand at the <u>International ITMA Fair 2023</u>	NTT	Milan, Italy	08 - 14.06.2023

WHAT'S NEXT?

What? 	Who? 	Where? 	When? 
<u>EUROTOX Congress 2023</u>	RIVM	Ljubljana, Slovenia	10 - 13.09.2023
SUPREME Consortium General Meeting	ALL	Crete, Greece	26 - 27.09.2023
<u>IFIB – International Forum on Industrial Biotechnology and Bioeconomy</u>	NTT	Florence, Italy	28 - 29.09.2023
<u>ECOMONDO</u>	NTT	Rimini, Italy	07 - 10.11.2023
<u>MRM2023/IUMRS-ICA2023 Advanced Materials Research Grand Meeting</u>	PCN	Kyoto, Japan	11 - 16.12.2023

Looking forward to SUPREME Newsletter # 2 in December 2023!

CONSORTIUM



#supreme-coating



@supreme_eu_proj



www.supreme-project.eu

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