

**BIOVITAE®**

SANITIZES  
PROTECTS  
ILLUMINATES

# SANITIZES PROTECTS ILLUMINATES

Biovitae is a patented LED sanitizing technology that uses a combination of wavelengths of the visible spectrum without UV, which can eliminate bacteria and viruses continuously and safely for people and animals.

A light that sanitizes air and surfaces without interrupting normal daily activities and illuminates the rooms in which it is installed with natural white light.

**Effective on viruses and bacteria, it kills 99.8 percent of Coronavirus within minutes.**

\*Independent tests on the technology have shown a reduction of up to 99.8% on SARS-CoV-2 in 60' on surfaces. Independent technology tests on Staphylococcus aureus (MRSA, E.Coli, P.Aeruginosa and B. Atropheus, have shown a reduction of up to 99.9% in 2 hours on all types of surfaces.



# BIOVITAE®

SANITIZES  
PROTECTS  
ILLUMINATES



Eliminates bacteria



Eliminates viruses,  
including SARS-COV-2



Penetrates and eliminates  
the biofilm



Reduces odors\*\*



Reduces the risk of  
allergies\*



UV free



For continuous use in the  
presence of people and animals



Natural white light



High energy  
efficiency



\*Active on microorganisms that cause allergies through pollen or dust

\*\*Of bacterial origin

# BIOVITAE PHILOSOPHY

BIOVITAE'S PHILOSOPHY IS BASED ON THE IDEA THAT **LIGHT CAN IMPROVE PEOPLE'S WELL-BEING**, MAKING THE ENVIRONMENTS IN WHICH WE LIVE AND THE OBJECTS WE USE HEALTHIER AND SAFER.

THANKS TO ITS INNOVATIVE CONTINUOUS SANITIZATION TECHNOLOGY, **BIOVITAE HELPS PREVENT INFECTIONS**, MINIMIZING ENVIRONMENTAL IMPACT AND ENERGY CONSUMPTION.





# BIOVITAE, HEALTHTECH TECHNOLOGY FOR SAFE, CONTINUOUS AND SUSTAINABLE SANITIZATION



**WORKS ON AIR AND  
SURFACES, EVEN IN THE  
PRESENCE OF PEOPLE**



**LED (UV-FREE) NO  
RISK OF EXPOSURE**



**SANITIZE DURING  
DAILY ACTIVITIES**

# BIOVITAE HEALTHFUL AND SAFE: HEALTHY AND SAFE ENVIRONM

**Only BIOVITAE offers continuous sanitization and contextual lighting of environments in a totally safe way for humans with the same device. Alternatively, it can be used only with the sanitization function for specific applications.**

Neither ultraviolet (UV) light frequencies nor chemical disinfectants nor HVAC systems can guarantee continuous sanitization of air and surfaces in rooms because they cannot be used in the presence of people and are harmful to the environment and living beings.



# BIOVITAE OVERVIEW

ALL-IN-ONE



SMART



PLUG&PLAY



HEALTHFUL



SAFE



SUSTAINABLE



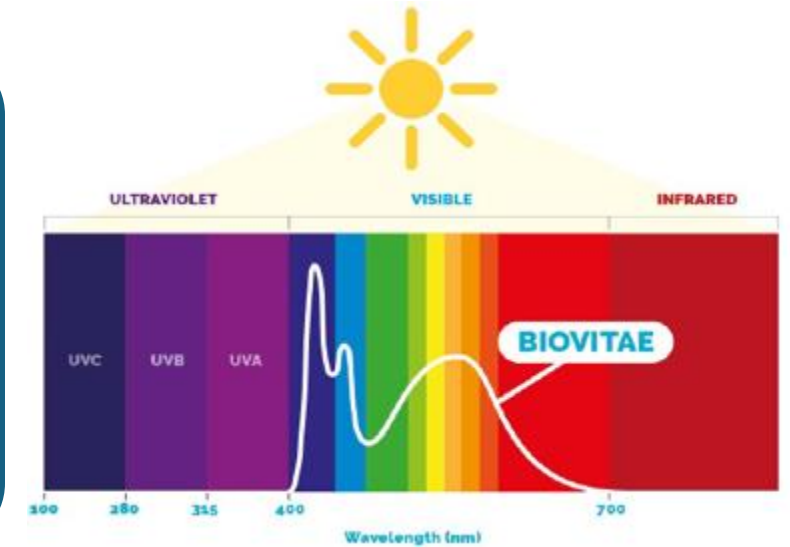
# A LED WITH SUNLIGHT IN IT

## THE TECHNOLOGY



**Biovitae microbicidal technology is enclosed in an LED that can be integrated into standard lighting fixtures and other solutions not strictly related to lighting such as means of transport, household appliances, sanitizing items, simply replacing normal LEDs with Biovitae LEDs.**

## THE MECHANISM



- **Biovitae replicates the spectrum of sunlight and is totally UV-free**
- **The technology uses visible wavelengths in the 400-420nm range (Soret band) that can kill viruses and bacteria, including those protected by biofilm, through irreversible membrane damage.**

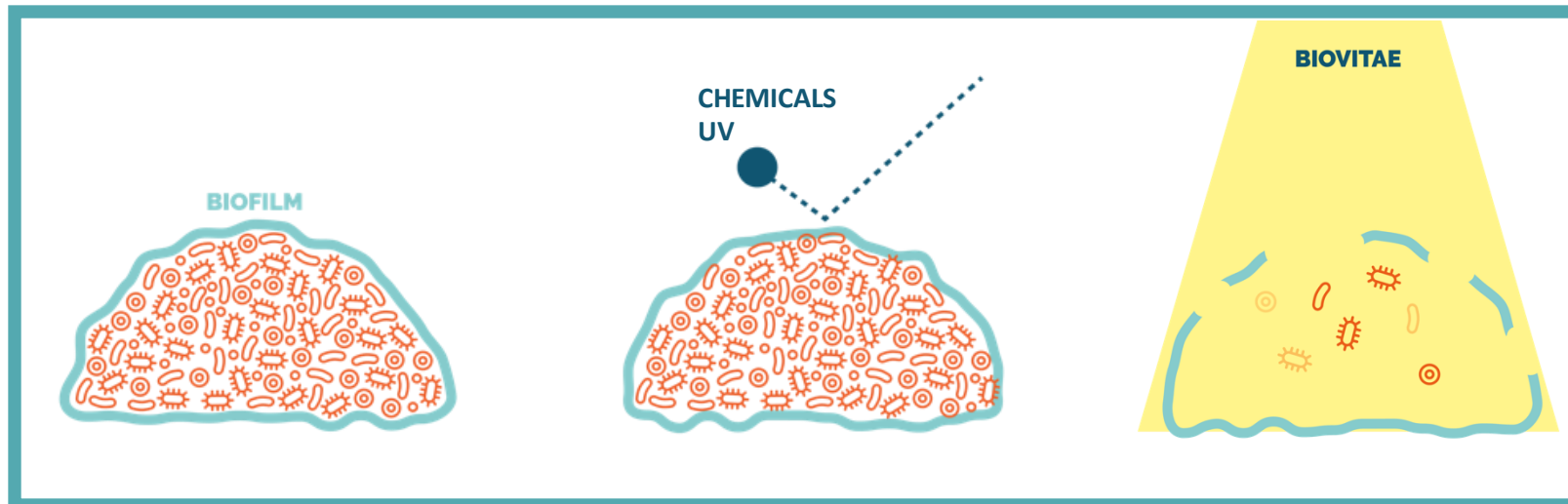


# BIOVITAE IS EFFECTIVE ON BIOFILM

Biofilm is an invisible gelatinous mass that adheres to surfaces and protects bacteria from environmental stress.

Bacterial cells within the biofilm become more resistant to disinfectants, antibiotics, and immune system attacks.

The bacterial biofilm is **the main cause of antibiotic resistance and infections: Between 60% and 80%\* of microbial infections are associated with biofilm formation.**



**CHEMICALS AND UVS ARE NOT ABLE TO ELIMINATE THE BIOFILM, VISIBLE LIGHT CAN PENETRATE IT BUT ONLY THE FREQUENCIES OF BIOVITAE ARE ABLE TO DEGRADE IT AND KILL THE BACTERIA INSIDE IT.**

# SANITIZATION TECHNOLOGIES COMPARED

	SANITIZATION BY LIGHT				
	CHEMICAL SANITIZATION	HVAC	UV-C	SINGLE BLUE 405nm FREQUENCY	BIOVITAE
TYPE OF SANITIZATION	Flash and manual	Continuous and passive	Episodic	Episodic	Continuous and passive
CONTINUOUS SANITIZATION IN PRESENCE OF LIVING BEINGS	✗	✓	✗	✗	✓
SIMULTANEOUS EFFECTIVENESS ON AIR AND SURFACES	✗	✗	✓	✓	✓
ACTS EFFECTIVELY ON ALL PATHOGENIC MICROORGANISMS	✗	✗	✗	✗	✓
RISK OF USE	Harmful	Safe	Harmful	Medium	Safe
ENVIRONMENTAL IMPACT	High	High	High	Medium	Very Low
PRICING AND ENERGY CONSUMPTION	Low pricing, requires an operator	Very High	High	Medium - High	Low



# WHERE

General Lighting  
Biosafe Environments



SCHOOLS AND UNIVERSITIES

HOMES

MEANS OF TRANSPORT

FOOD PROCESSING PLANTS

RESTAURANTS CANTEENS

FARMS AND STABLES

SUPERMARKETS

OFFICES

STATIONS AND AIROPORTS

HOSPITALS

Vertical Applications



TOUCH SCREEN

ELEVATORS

GYM and SPA

WHITEGOODS

WORKPLACES

CONTAINERS

INDOOR FARMING

**CHEMICALS**



**UV-C**



**405NM BLU-VIOLET**



**BIOVITAE**



# BIOVITAE IS CLEANTECH

**BIOVITAE is the greenest sanitization system of the future.**

It reduces the environmental impact and guarantees continuous sanitization in the presence of people and animals, with high performance and low consumption.

**High energy efficiency class**

**Does not release pollutants**

**No consumables required** until the end of life  
**All devices are recyclable** according to the European WEEE Directive

**All-in-one**, built-in sanitization and lighting function **without additional energy required**



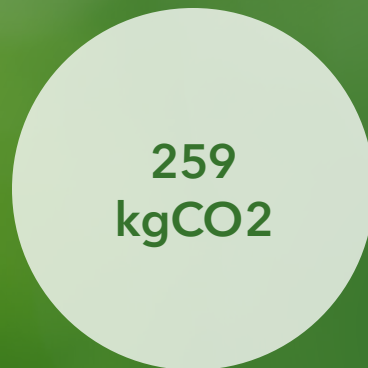
# LOWER ENVIRONMENTAL IMPACT, HIGHER SANITATION



BIOVITAE  
Panel 60x60



UV 222nm  
R-Zero VIVE



405nm  
Ledtailor P100  
60x60 panel



UV 254nm  
R-Zero Beam



HVAC  
Media di settore

LOWER ENVIRONMENTAL  
IMPACT OF BIOVITAE %

-50%

-149%

-523%

-3853%

The CO<sub>2</sub> emission intensity (kg CO<sub>2</sub>/kWh) is calculated as the ratio between the CO<sub>2</sub> emissions of public electricity production (as the share of CO<sub>2</sub> emissions of public electricity and heat production related to electricity production) and the gross production of electricity. The CO<sub>2</sub> emission intensity values of sanitization technologies were calculated as the product of the average CO<sub>2</sub> intensity in the European Union and the annual electricity consumption in one year required by the different sanitization technologies.

Fonte: <https://www.rensmart.com/Calculators/KWH-to-CO2>



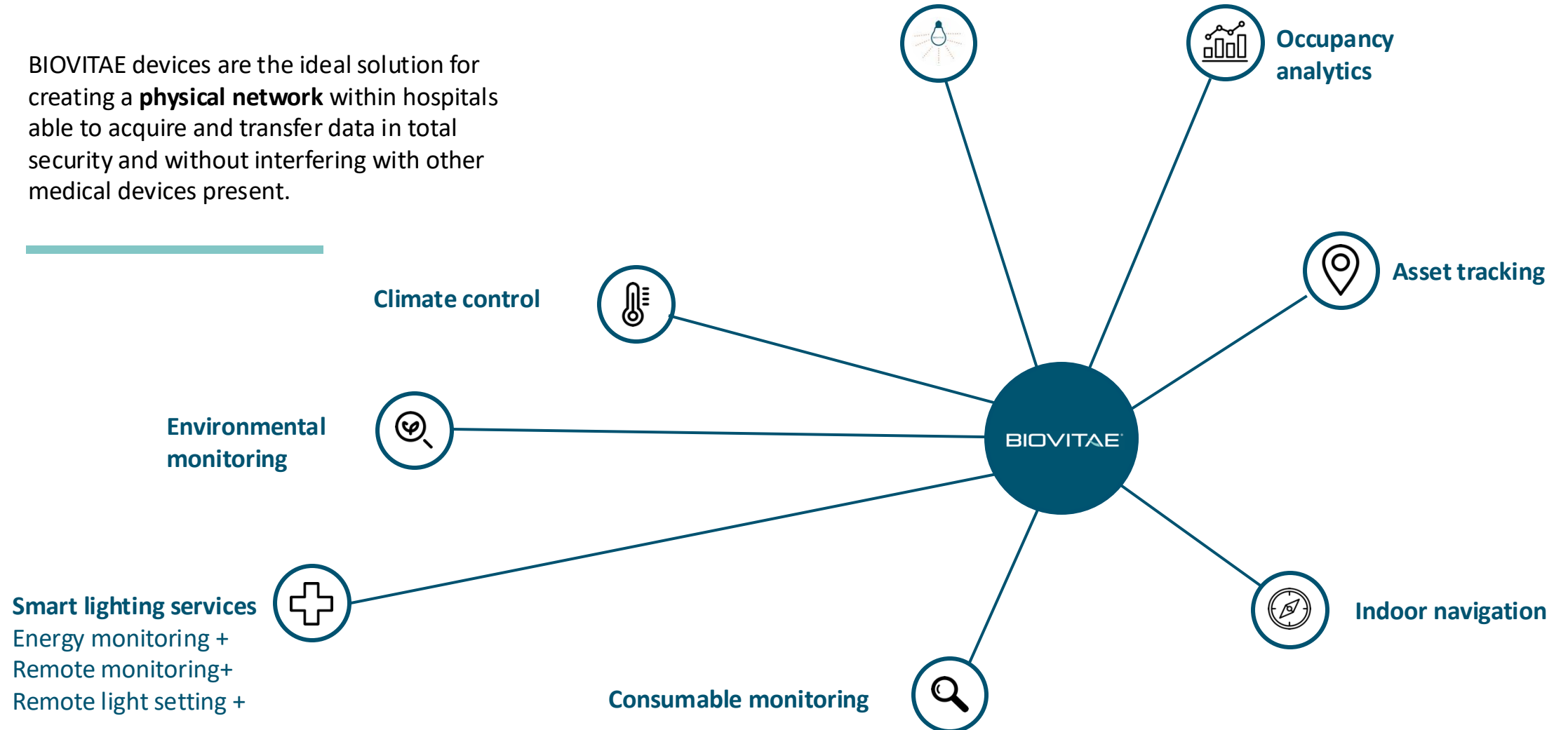
# BIOVITAE SANITIZING LIGHT + IOT – SMART BUILDING

BIOVITAE can be completed with wireless devices to create a **SMART BUILDING** network to be able to manage it remotely from any tablet, smartphone and PC.



# BIOVITAE AND IoT: SMART HOSPITAL

BIOVITAE devices are the ideal solution for creating a **physical network** within hospitals able to acquire and transfer data in total security and without interfering with other medical devices present.







# HEALTH CARE SECTOR



# HEALTHCARE FACILITIES

Biovitae participates in the **Joint Research Platform for Healthcare Infrastructures**, an innovative technology platform created by the Politecnico di Milano that brings together all public and private stakeholders in the healthcare sector who can test and implement advanced innovation strategies in the fields of technology, organization, construction and process management.

**Biovitae will provide the continuous sanitization solution** to control the proliferation of pathogens and reduce the risk of Healthcare-Associated Infections (**HAIs**) in hospital environments.

**POLITECNICO MILANO 1863**  
DIPARTIMENTO DI ARCHITETTURA, INGEGNERIA DELLE COSTRUZIONI E AMBIENTE COSTRUITO

Fondazione Politecnico di Milano

**Healthcare Infrastructures**  
JOINT RESEARCH PLATFORM

## THE NEXT GENERATION HOSPITAL

**Associati Platinum**

- ERD ROSSINI
- KORIAN
- mca mario cucinella architects
- med HEALTH TECHNOLOGIES
- PHILIPS
- POLITECNICA BUILDING FOR HUMANS
- relyens
- SIEMENS
- TECNICAER engineering s.r.l. Human engineering & life
- BIOVITAE LA LUCE CHE PROTEGGE
- Deerns

**Associati Gold e Istituzionali**

- ASSA ABLOY Entrance Systems
- copma
- coopservice
- Gerflor
- since 1998 HARPACEAS More than BIM
- HUMANITAS
- AREU
- MAPEI
- REair
- Opedale Maggiore di Lodi Darreth e Presid Lodigiani
- SERVIZIO SANITARIO REGIONALE EMILIA-ROMAGNA

# CLEANROOM

In cleanrooms, Biovitae reduces the risk of contamination of processes and manufactured products of any kind to ensure maximum patient safety.

Pollution from organic or inorganic particles classified as 'contamination' must be strictly monitored and must always be kept at levels close to zero.



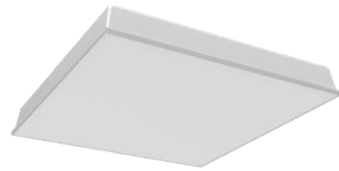
BIOVITAE  
PRODUCTS





# "ALL IN ONE" DEVICES

**SANITISATION + ILLUMINATION**



**BIOVITAE PRO**



**BIOVITAE LOBBY**



**BIOVITAE ORBIT**



**BIOVITAE DOMUS**



**BIOVITAE GU10**



**BIOVITAE TUBE**



TEST  
PATENTS  
CERTIFICATIONS

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## TEST ON VIRUSES

(in vitro)



- Vaccinia (Monkeypox)
- Chikungunya
- Sars-CoV2
- Yellow Fever

Rapid inactivation of SARS-CoV-2 with LED irradiation of visible spectrum wavelengths



Journal of Photochemistry and Photobiology

journal homepage: [www.sciencedirect.com/journal/journal-of-photochemistry-and-photobiology](http://www.sciencedirect.com/journal/journal-of-photochemistry-and-photobiology)

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

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## TESTS ON BACTERIA

(in vivo and in vitro)



- E. coli MG1655 (ATCC 700926)
- E. coli, ATCC25922
- S. typhi (Ty21a-ATCC 33459)
- Klebsiella spp.,
- Enterobacter spp.,
- Pseudomonas spp.,
- S. aureus,
- S. microti,
- S.agalactiae
- M.tuberculosis
- E. coli (ESBL/ Carbapenems)
- S. aureus Methicillin (MRSA)
- P. aeruginosa Fluoroquinolones /Carbapenems
- A. baumannii. Fluoroquinolones / Carbapenems
- Klebsiella spp (ESBL/ Carbapenems)

## PATENTS GRANTED



## PENDING PATENTS



## CERTIFICATION, COMPLIANCE AND AWARDS



## AWARDS



Best Innovation  
2019



Best Innovation  
2020



Best Innovation  
2020



Best Innovation  
2021



Best Innovation  
2023



Best Startup  
2023



Top 20 Solutions Amr  
2024



## SCIENTIFIC COLLABORATIONS



The International Centre for Genetic Engineering and Biotechnology (by UNIDO)



Le Commissariat à l'énergie atomique - France



Scientific Department Italian Military Army



Swedish Defence Research Agency



Bundeswehr Institute of Microbiology Germany



Italian National Agency for New Technologies, Energy and Sustainable Economic Development



CIHEAM

intergovernmental organisation for agriculture and nutrition security



Technical Research Centre of Finland



Centro Italiano Ricerche Aerospaziali



Istituto Dermatopatico dell'Immacolata



SAPIENZA UNIVERSITÀ DI ROMA



UCBM UNIVERSITÀ CAMPUS BIO-MEDICO DI ROMA



UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II



UNIVERSITÀ DEGLI STUDI DI SALERNO



UNIVERSITY OF BIRMINGHAM

## POLICY MAKERS



PATH (Program for Appropriate Technology in Health) is an international, nonprofit global health organization based in Seattle with 1,600 employees in more than 70 countries around the world. PATH focuses on six platforms: vaccines, drugs, diagnostics, devices, system, and service innovations.



Unitaid is a global health initiative that works with partners to bring about innovations to prevent, diagnose and treat major diseases in low- and middle-income countries, with an emphasis on tuberculosis, malaria, and HIV/AIDS and its deadly co-infections



Joint Research Partnership Healthcare Infrastructures is a technology partnership to develop and test new technologies for use in the Hospital of the Future



United Nations program to accelerate, intensify and coordinate global action against AIDS



Launched during the work of the World Health Assembly in Geneva in 2019, the is a UNAIDS initiative to intercept technologies and startups with the highest potential for impact in the healthcare sector



Accelerator launched by global health organization PATH and the Commonwealth to promote the development and implementation of innovations that help public health systems and communities mitigate and adapt to the impacts of climate change



Initiative launched in 2001 and run by UNOPS to promote collective fight against tuberculosis



The AMR Innovation Mission UK 2024 is a programme that has as its overarching objective to contribute to the global reduction of antimicrobial resistance ("AMR") by promoting collaboration and joint innovation with UK businesses



INSTALLATIONS  
BIOVITAE

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# VERTICAL APPLICATIONS

## BIOVITAE VERTICAL APPLICATION FOR WHITE GOODS

- **Prototyping and industrialization** of the Biovitae vertical application for household appliances
- **Validation of efficacy** of the integration of Biovitae into dishwashers through tests conducted under real-world conditions: **reduction of the microbial load and of bad odors**
- **Presentation at IFA 2024 international trade fair in Berlin** of the new line of dishwashers **I-PRO SHINE** with Biovitae technology
- **Commercialization of HAIER products - BIOVITAE INSIDE** is scheduled for Q2 of 2025

## NEW LINE OF DISHWASHER Brand I-PRO SHINE WITH BIOVITAE TECHNOLOGY PRESENTED AT IFA 2024

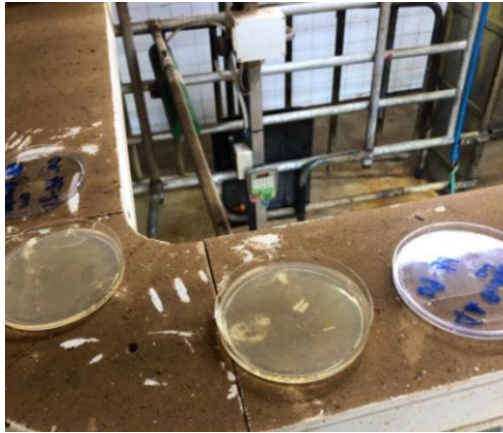


Key Players **Haier**



# LIGHTING INSTALLATIONS 1/3

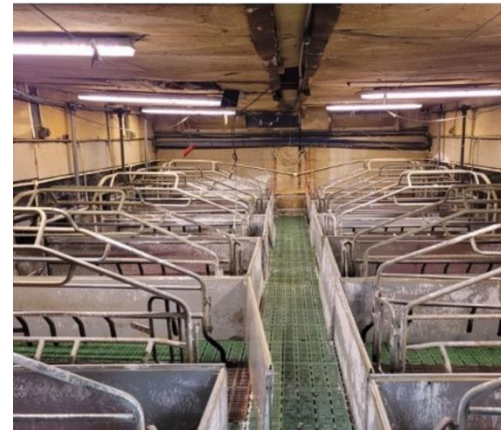
## LIVESTOCK AND FOOD PROCESSING



**Cow farm-** Fattorie De Vivo Italy



**La Granda farm-**  
Genola, Italy

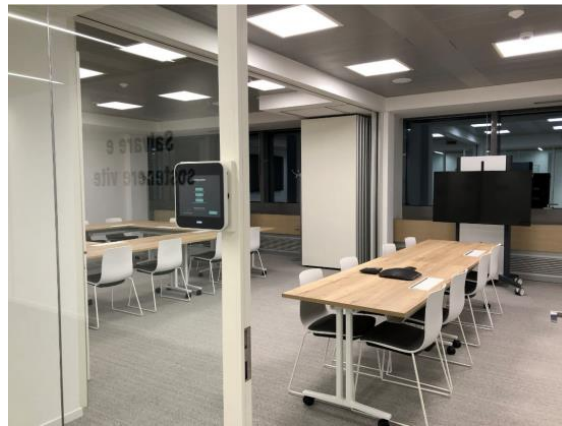


**Irish Pig Farming**



**Toricelle Dairy-** By Vivo Agriculture factory  
- Salerno, Campania

## OFFICES



**Baxter Headquarter** - Rome



**Prefecture** - La Spezia



**Lazio Innova Innovation Hub** - Viterbo



# LIGHTING INSTALLATIONS 2/3

## RETAIL AND SPORTS SECTOR



**Lavazza Flagship Store** - London



**La Cooperativa** - Cortina D'Ampezzo



**COOP**- Bologna, Italy



**Sampdoria's Dressing Room** - Genoa

# LIGHTING INSTALLATIONS 3/3

## HEALTHCARE



**Montevergine Hospital** – Operating Room –  
Department of Cardiology Campania



**IDI Dermopathic Institute of the Immaculate  
Conception - Rome**



**Outpatient Clinic** – Corte dei Conti



**ADR- Rome Fiumicino Airport Emergency  
Hospital**

## SCHOOL AND UNIVERSITIES



**St. Walburg Elementary School** –  
Germany



**Moscato High School**– Sant'Antimo, Italy



**University of Camerino**– Italy



**Campus Biomedico University  
Hospital**–Rome

# BIOVITAE®

[www.biovitae.it](http://www.biovitae.it)



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