

BIOVITAE®



**THE AMR
CRISIS:
A GLOBAL
CHALLENGE**

Antimicrobial resistance (AMR) is one of the greatest threats to global health today

Each year, an estimated **7.7 million deaths** are attributed to bacterial infections, an impact comparable to tuberculosis, influenza, and HIV/AIDS combined.

Of these infections, **4.95 million** are associated with antimicrobial resistance and **1.27 million** are caused by pathogens resistant to available antibiotics.

75% of these infections occur in health care settings.

Source: Antimicrobial resistance: an enormous, growing, and unevenly distributed threat to global health, The Lancet, 23 May 2024

Rethinking our Approach

Nature has always provided us with the best solutions. Our grandmothers already knew that sunlight is the most powerful natural disinfectant.

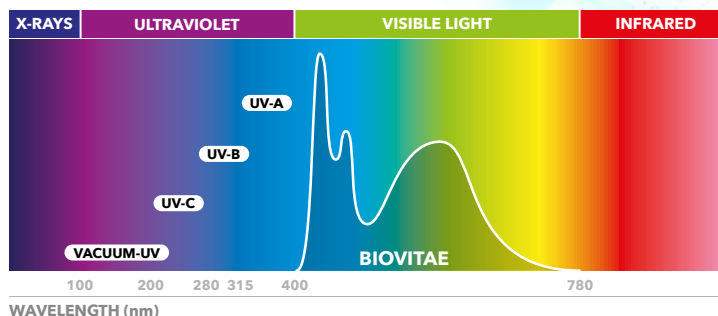
Today we must recover this wisdom: **we must not fight bacteria but learn to live with them.**

Traditional methods - antibiotics, chemical disinfectants - have shown their limits. Bacteria develop resistance because their goal is to survive and replicate.

The solution is not to use more aggressive chemicals, but **to restore the right balance in the microbial ecosystem.**

Biovitae the light that protects

Biovitae represents a revolution in the field of environmental sanitization. A microbicidal LED that uses specific wavelengths of visible light, replicating in a controlled and enhanced manner the sanitizing effect of sunlight, without the risks associated with UV light.



Biovitae spectrum with the three peaks in the wavelengths (400-420nm, 430-460nm, 500-780nm)

Biovitae's patented combination of frequencies acts on all bacteria*, especially on GRAM+ and GRAM- fungi and moulds**, thus helping to maintain the balance between the various

microbial species as it occurs in nature. An action that does not develop bacterial resistance as happens with chemical disinfectants and ultraviolet frequencies.

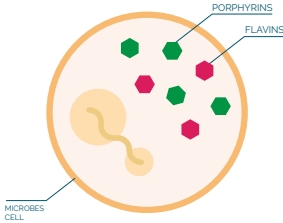
*Independent tests on the technology showed a reduction of up to 99.8% of SARS-CoV-2 (enveloped virus) on surfaces in 60'. Independent tests on the technology showed a reduction of up to 99.9% of Staphylococcus Aureus (MRSA), E.coli, P. aeruginosa and B. atrophaeus on surfaces in 2 hours. Sanitization performances may vary depending on the amount of light that reaches surfaces in the environment where the product is installed and the exposure time. Tests carried out on various strains of viruses and bacteria in experimental conditions.

** Of bacterial origin

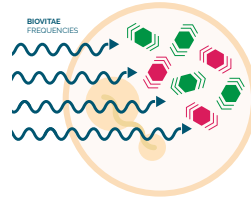
Bacterial Biofilm is the main cause of bacterial resistance and infections. About 60% of microbial infections are associated with biofilm formation.

Biovitae frequencies can eliminate biofilm by penetrating it and acting effectively on the bacteria within it.

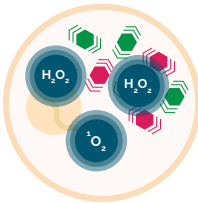
HOW BIOVITAE ACTS ON BACTERIA AND BIOFILM



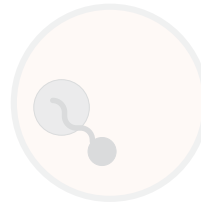
1 Bactericidal action is activated by stimulating porphyrins and flavin present in microbes, which are sensitive to blue-violet frequencies



2 This stimulation triggers a photodynamic effect that generates ROS such as hydrogen peroxide.



3 ROS cause oxidative damage to the cell membrane of microbes



4 Oxidative damage causes the ultimate death of microbes

HOW BIOVITAE ACTS ON VIRUSES

The action on viruses is exerted through damage to the viral structure caused by absorption of **Biovitae frequencies** by proteins, lipids, and nucleic acids, causing photochemical

modifications. This action can generate reactive oxygen species (ROS) that damage viral genetic material (RNA/DNA) and structural proteins.

Biovitae's approach goes beyond simple sanitization: it represents a new paradigm in managing the microbiological safety of environments.

The technology promotes a dynamic balance of the microbial ecosystem, inspired by the self-regulatory mechanisms that allow different populations to coexist in a sustainable way.

This balance is critical to maintaining a healthy and resilient environment where the continued control of pathogenic microorganisms promotes, in competition, the proliferation of beneficial ones.

THE REAL REVOLUTION OF BIOVITAE LIES IN ITS ABILITY TO SANITIZE CONTINUOUSLY AND SAFELY, EVEN IN THE PRESENCE OF PEOPLE WITHOUT INTERFERING WITH DAILY ACTIVITIES.

A major difference from traditional sanitization systems that require interruption of activities and/or vacant environments.

Biovitae, the LED with the sun inside

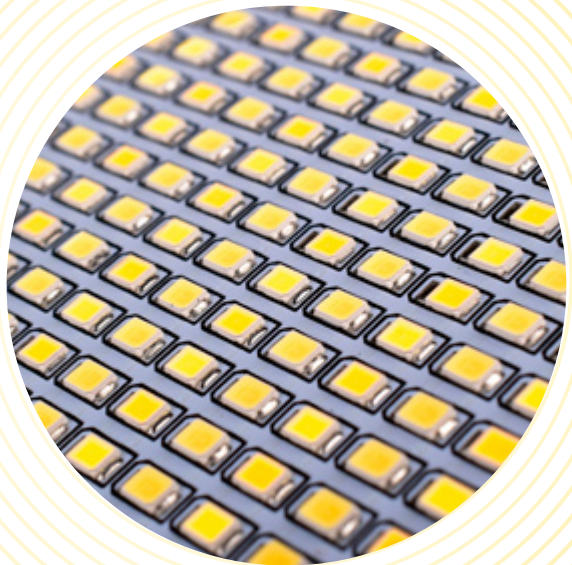
**It uses the natural power
of light for sanitization**

**Operates continuously, even
in the presence of people**

**Respects the balance of the
bacterial ecosystem**

Is a sustainable technology

**It is in line with the One
Health approach**



Indoor environments

Indoor air can be up to **five times more polluted** than outdoor air. About **90% of the world's population** breathes polluted indoor air on a daily basis, and **50% of people develop diseases** related to indoor pollution. Indoor biological pollution can transmit insidious **infectious diseases**.

BIOVITAE GUARANTEES

- **Microbiologically safe** Indoor environments
- **Reduced risk of infection and allergies** caused by viruses, bacteria, fungi, spores
- **Improved light quality** of the environments



INSTALLATION AT
**UNIVERSITÀ
CAMPUS BIOMEDICO
IN ROME, ITALY**

Healthcare

In case of hospitalization, the chance of contracting a **healthcare-associated infection (HAI)** is 5%. Every year **136 million cases** of infections associated with antibiotic resistance are recorded worldwide. It is estimated that in 2019, **5 million deaths** were associated with AMR.

BIOVITAE GUARANTEES

- **Continuous sanitization** of the environments
- Reduced risk of **Healthcare-associated infections**
- Optimization of **healthcare costs**
- **Protection** for patients and healthcare professionals



INSTALLATION AT
**POLIAMBULATORIO
CORTE DEI CONTI
IN ROME, ITALY**

Food Industry

Each year, food contamination causes **600 million illnesses** and **420,000 deaths** worldwide. In addition, **76% of food recalls** are related to microbial contamination.

BIOVITAE GARANTISCE

- Prevention of **microbial contamination**
- **Surface and air protection** in production environments
- **Increased food security**
- **Waste** Reduction



INSTALLATION AT
**LA GRANDA FACTORY
IN GENOLA, ITALY**

Biovitae over time has activated numerous collaborations and partnerships with key policy makers in the fight against antimicrobial resistance to make a contribution to the One Health approach promoted by WHO



BIOVITAE®

LIFE IS LIGHT

