

Project consortium:

16 entities from 10 countries, dedicated to research and development, have created **MeLiDos project**, supported by **EURAMET** (European Association for National Metrology Institutes).

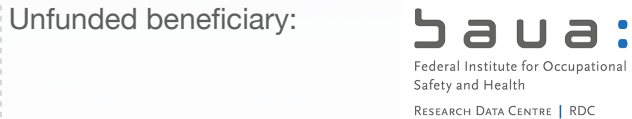
Internal beneficiaries:



External beneficiaries:



Unfunded beneficiary:



Associated partner:



MeLi Dos

Metrology for wearable Light loggers and optical radiation Dosimeters



Groundwork for the
standardisation of
wearable light sensors
designed to study the
biological and
physiological effects of
light

<https://www.melidos.eu/>

METROLOGY
PARTNERSHIP

EURAMET



Co-funded by the
European Union

The project (22NRM05 MeLiDos) has received funding from the European Partnership on Metrology, co-financed from the European Union's Horizon Europe Research and Innovation Programme and by the Participating States.

The Light Beyond Vision: Health and Human Behaviour

Light is the part of the electromagnetic spectrum that can excite the human retina and create the sensation of **sight**, but its absorption also affects our health, psychology and behaviour, influencing the **regulation of circadian rhythms, sleep, cognition, neuro-endocrine balance and mood**.

The Impact of Artificial Light: Health and Modern Chronobiology

Throughout human evolution (day)lighting has been a reliable indicator of the time of day. Electric lighting has changed human habits, encouraging more indoor activities and longer evening hours.

Artificial light is much dimmer and **has a different spectral composition**, especially in the short wavelengths that we see as **blue**. Insufficient light during the day and too much light at night disrupts **circadian rhythms**. This disruption can lead to mood swings, insomnia and an increased risk of serious illnesses such as heart disease, psychiatric disorders and cancer.

The **variability of actual ambient light**, influenced by architecture and lifestyles, makes it **difficult to accurately assess its full impact on human health**.



MeLiDos project:

Metrology for wearable Light bloggers and optical radiation Dosimeters

The project aims to **develop advanced methods** for the accurate **characterisation of portable optical radiation measurement devices**. A metrological approach will be used to produce **guidelines for characterisation and use**.

Better interpretation of indoor light will lead to **integrated lighting**, integrating visual and non-visual effects and providing psychological benefits to people. The project will also tackle the characterisation of solar UV dosimeters, as more **accurate measurement of UV radiation** will be useful for better protection of outdoor workers and recommendations for the general public exposed to solar UV radiation.



Portable
Light Loggers

Objective 1:

- Develop and validate **new characterisation methods** and define a validated set of **quality indices for wearable optical radiation dosimeters**, focusing on areas relevant to daily life (visible and UV).

Objective 2:

- Develop data **analysis methods** to verify and improve the quality of data, and to establish correlation between different data sets to **improve reproducibility** and make **comparisons between different devices more reliable**.

Objective 3:

- Analyse use cases for wearable light loggers based on end-user needs and then make recommendations based on these needs on:
 - i) **(meta) data model** and **data formats**, summary metrics.
 - ii) **practical use of light loggers**, including device placement, compliance and quality control.

Objective 4:

- **Evaluate the performance of new portable devices** capable of measuring spatially resolved photo-biological quantities and **compare** them with spatially averaging devices to determine relevance depending on the application.

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Expected impact

Creation of **guidelines on good lighting practice** for use by researchers, architects, lighting installers, health professionals and consumers. The aim is to be able to calculate and interpret in a simple way whether the visible light received indoors is consistent with the light needed for the correct functioning of **biorhythms and circadian balance**. The solar UV measurements will be used to **propose improvements** in the **protection of outdoor workers**.