

## Participating Countries

Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Greece, Iceland, Italy, FYR Macedonia, The Netherlands, Poland, Portugal, Romania, Serbia, Spain, United Kingdom

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[www.imaac.eu](http://www.imaac.eu)



COST Action CA16227


IMAAC Investigation and Mathematical Analysis of Avant-garde Disease Control via Mosquito Nano-Tech-Repellents

[www.cost.eu](http://www.cost.eu)

# IMAAC

Investigation and Mathematical Analysis of Avant-garde Disease Control via Mosquito Nano-Tech-Repellents



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COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.



# Investigation and Mathematical Analysis of Avant-garde Disease Control via Mosquito Nano-Tech-Repellents

## Overview

Dangerous mosquito species, such as the *Aedes aegyptis* species, can carry and spread the diseases Dengue, Zika, Chikungunya and yellow fever. Climate change, urbanization, and global travel are just a sample of the variables increasing the range of vector borne disease transmissions geographically northward out of the tropics. Control of disease transmission has been problematic by being either inefficient (i.e. bed-nets, vaccines) or by having negative environmental impacts to the ecosystem and humans (i.e. insecticide poisoning, chemical runoff).

This COST Action uses an **interdisciplinary approach** to investigate a state-of-the-art method of controlling mosquito activity by the application of nanoparticles for a controlled slow-release of repellents and insecticides. These "**nano-insecticides**" can be applied to textile material and dispersed in paints acting to deter the feeding of mosquitos; protecting humans and livestock from bites.

Further investigation is needed to evaluate the feasibility and effectiveness of this nanoparticle approach to mosquito control and further the development of a new generation of insecticide applications.

## Overall Objective

The overall objective of *COST Action CA16227* is to investigate the efficacy of state-of-the-art nano-insecticides imbedded in textiles and paints on mitigating the spread of dangerous vector-borne (mosquito-borne) diseases.

## Participation and Networking

- This multi-disciplinary COST Action brings together international scientists from the fields of ecology, biology, chemistry, mathematics, engineering, and environmental sciences as well as industry partners from agriculture and textile manufacturing.
- COST provides the tools to network with partners from across Europe and International Partner Countries to enable innovation in science and technology.

## Working Groups

- WG1** Mathematical analysis, data analysis, statistics
- WG2** Structured population models and optimal control
- WG3** Biological and epidemiological research on vector borne diseases focusing on avant-garde control measures
- WG4** Avant-garde control measures in combination with textile and paints using industrial applications
- WG5** Pilot field studies and their management
- WG6** Data-collection, communication and dissemination

**Our problem:**  
*diseases transmitted by mosquitos*

**Our objective:**  
*environmentally sustainable mosquito control*

**Our approach:**  
*use nanotechnology to release agents in a well-controlled dosage*

## Societal Benefits of IMAAC

- Development of advanced mosquito-repelling materials
- Reduction of the spread of mosquito-transmitted diseases
- Support of international collaboration between various sciences and industry to develop solutions to vector-borne disease transmission.

## Why participate in COST?

Participating in a COST Action joins people from diverse disciplines and sectors to collaborate in the development of new research ideas and innovation while enhancing career prospects.

COST is an EU-funded programme that enables researchers to set up their interdisciplinary research networks in Europe and throughout the world.

The funding provided opens opportunities for researchers from different disciplines and at any career stage to network with the goal of increasing communication and relationships that go beyond this one Action and lead to further cooperative research endeavors and state-of-the-art product development.

Funds are used toward activities such as:

- Meetings and workshops
- Organizing conferences
- Training schools
- Short term scientific missions
- Information dissemination activities

## Who can join?

COST Actions welcome participation from those working in Universities, research centers, Small and Medium-sized Enterprises (SMEs), and public and private organizations from the 36 COST Member states across Europe and its Cooperating State.

Researchers from Near Neighbour Countries and International Partner Countries can also participate.