



Biomedicine and Molecular Biosciences (BMBS)

Participating countries

AT,CH, DE, DK, EL, ES, FR, IT,PL, PT, UK

COST Action no.BM1102

Ciliates as model systems to study genome evolution, mechanisms of non-Mendelian inheritance, and their roles in environmental adaptation

2009 | 2013

Objectives:

The main objective of this Action is to establish a network of molecular biologists working on Ciliates in order to strengthen and consolidate European research in this area aiming at deciphering the molecular mechanisms underlying epigenetics and non-Mendelian inheritance and environmental adaptation.

Main Achievements

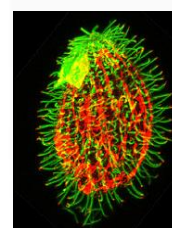
■ **Capacity building due to networking:**

1. -the creation of contacts among the different research groups that will increase the transfer of knowledge and technologies, and the improvement of the research basis established in the different groups of the European network.
2. - the joining of other members in the network, in particular the groups that are not directly involved in epigenetics and open new perspectives of interactions.
3. - the organization of a training school to attract early stage researchers on this topic, and to improve the transfer of knowledge.

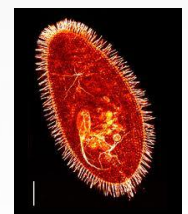
Contact details

Chair of the Action
Name and Surname,
Position,
Institution, country
email address

Science Officer
Science Officer Biomedicine and
Molecular Biosciences
COST Office
Dr Magdalena Radwanska
magdalena.radwanska@cost.eu



Tetrahymena



Paramecium



Euplotes



Oxytricha

Ciliates species



COST is supported by the EU RTD Framework Programme



ESF provides the COST Office through a European Commission contract



Working Group activities

Working Group 1 : Study of the developmentally regulated genome rearrangements showing epigenetic mechanisms and characters with non-Mendelian inheritance

- Identification and characterization of genes/proteins involved in epigenetic programming of developmentally regulated genome rearrangements and in macronuclear chromosome copy number control.
- Establishment of viable genetic mutant models that alter genome rearrangements and/or their non-Mendelian inheritance.
- Characterization of long and short RNA molecules.

Working Group 2 :Genetic variation of adaptive significance.

- By comparing the genome of cold adapted and mesophilic ciliates it will be possible to identify new evolved genes and proteins and to understand their evolutionary history. This analysis is expected to unravel the molecular mechanisms responsible for long-term cold adaptation.
- To unravel the molecular mechanisms responsible for a short-term thermal adaptation, the differential gene transcription in response to thermal stress will be analysed at whole transcriptomic level in cells of psychrophilic and mesophilic species incubated at different temperatures.

Working Group 3 :Linkage of non-Mendelian inheritance to environmental adaptation.

- Selection and identification of epigenetically inherited alternative genome rearrangements with adaptive potential
- Environmental stress and modification of epigenetic programs

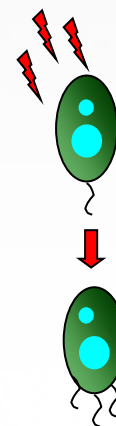
Industry participation

Name of the company

Genoscope

CEA/Institut de Génomique/Genoscope
 2, rue Gaston Crémieux
 CP5706
 91 057 Evry Cedex
 France
 Email
 address:labbas@genoscope.cns.fr
 Website :
<http://www.genoscope.cns.fr/>

Long and/or short term stress/permanent environmental pressure



Modifications in the programmed DNA elimination inherited in non-Mendelian manner

New gene functions/new proteins



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