

CITIZEN SCIENCE

# MELANOGASTER

Catch The Fly.

International Citizen Science Network on Adaptation Genomics



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

f X i #MelanogasterCTF

Roberto Torres

LCATM, Creative Director

[rtorres@fruitfly.eu](mailto:rtorres@fruitfly.eu)



With the collaboration of:



Partners:

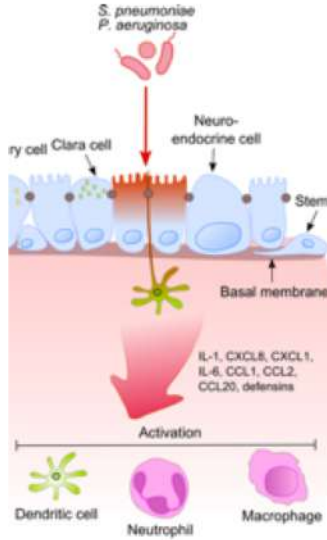


Organisers:



# UNDERSTANDING ADAPTATION

As the basis of the ability of species to survive in changing environments, host-pathogen interactions, resistance to pesticides and drugs.




ARTICLE

[Check for updates](#)

<https://doi.org/10.1038/s41467-022-29518-8> OPEN

Population-scale long-read sequencing uncovers transposable elements associated with gene expression variation and adaptive signatures in *Drosophila*

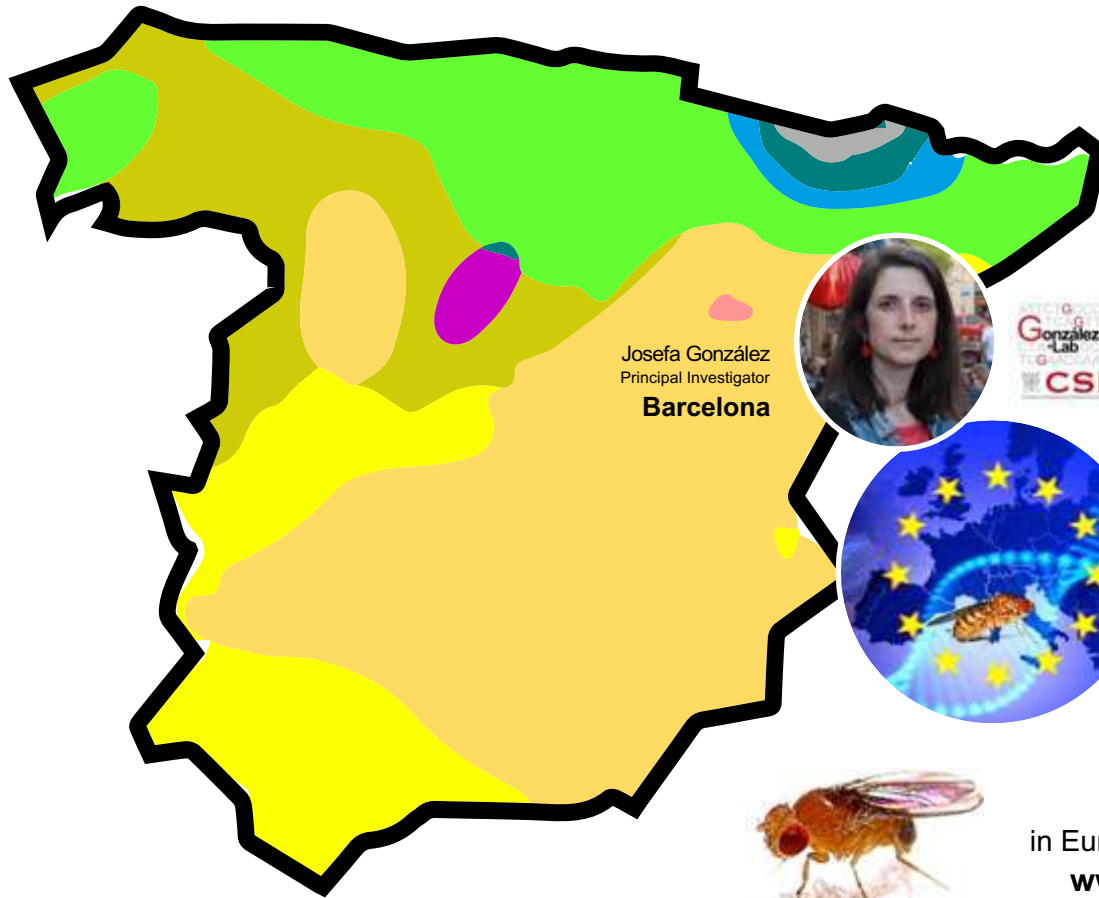
Gabriel E. Rech<sup>1</sup>, Santiago Radio<sup>1</sup>, Sara Guirao-Rico<sup>1</sup>, Laura Aguilera<sup>1</sup>, Vivien Horvath<sup>1</sup>, Llewellyn Green<sup>1</sup>, Hannah Lindstadt<sup>1</sup>, Véronique Jamilloux<sup>2</sup>, Hadi Quesneville<sup>2</sup> & Josefa González<sup>1</sup> <sup>1</sup>✉



*Drosophila melanogaster*

Dr. Josefa González



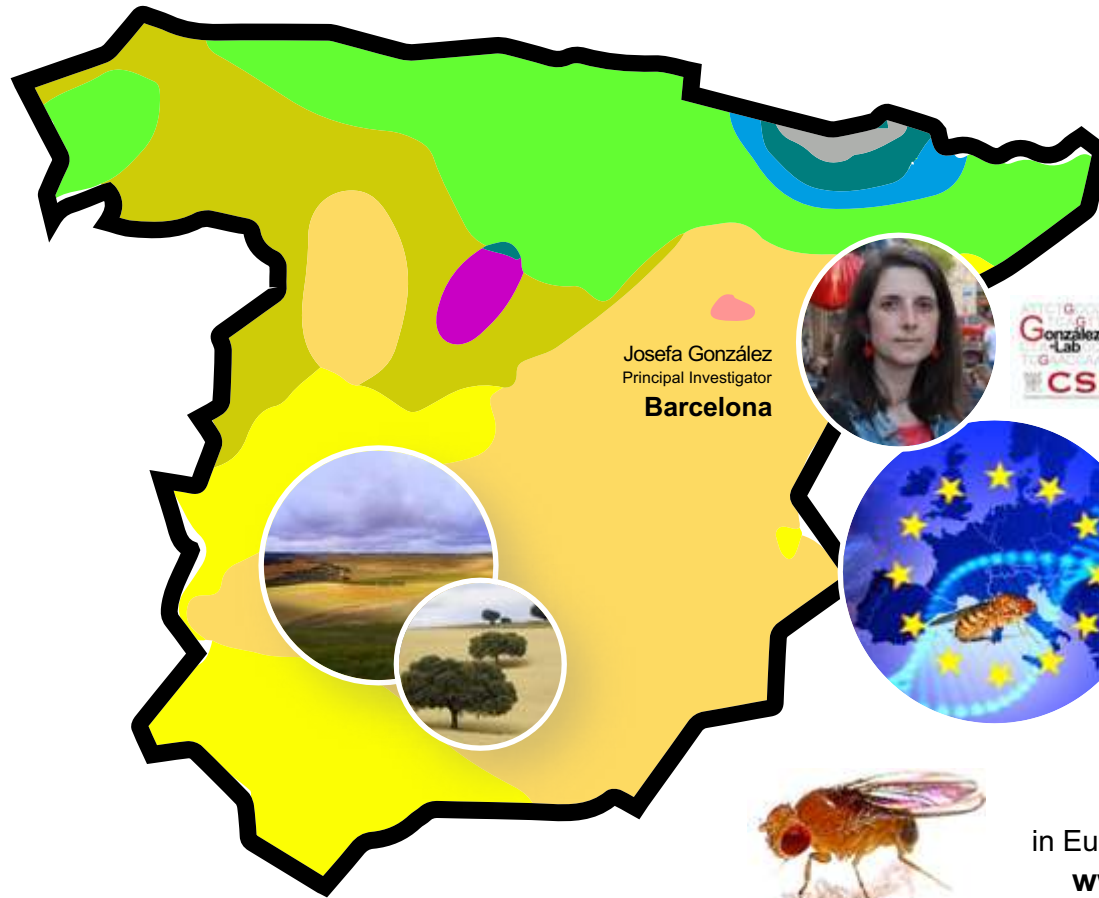


Josefa González  
Principal Investigator  
**Barcelona**

González Evolutionary and Functional Genomics Lab CSIC

**DROSEU**  
EUROPEAN DROSOPHILA  
POPULATION GENOMICS CONSORTIUM

**69 labs**  
**29 countries**  
in Europe and beyond  
[www.droseu.net](http://www.droseu.net)



González Evolutionary and Functional Genomics  
Lab  
CSIC

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Principal Investigator  
**Barcelona**



González Lab  
Evolutionary and Functional Genomics  
**CSIC**

**LCATM**  
Science in Your World

**RURAL SCHOOLS**



**EXPEDITE A SCIENTIFIC PROCESS**



**Scientists**

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CITIZEN SCIENCE  
**MELANOGASTER**  
Catch The Fly!

**Educational materials:**

Presentations and short videos to increase the participants understanding knowledge about the nature of science and the relevance of their contribution to the scientific project. **(Epistemic knowledge)**

Master Class by the Project P.I.







**Fieldwork and lab work:**

Collecting and classifying fruit flies, observing variability within a population.  
(Procedural knowledge)



*Drosophila melanogaster*



*Drosophila simulans*



*Drosophila suzukii*



Others

CITIZEN SCIENCE  
**MELANOGASTER**  
 Catch The Fly<sup>®</sup>



Fabian Staubach



Ira kozeretska



Aleksandra Patenkovic

Escuela de Biología  
 UNAH  
 Honduras



Virna López



Carlos Arboledas



Luisa Pallares



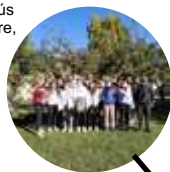
Colegio "Francisco Fernandez de Contreras"  
 Ocaña, Norte de Santander, Colombia



Pascale LESAGE



Colegio Niño Jesús  
 Fundación Educere,  
 Burgos



IES Benjamín James,  
 Osera de Ebro



IES Alonso de Ercilla,  
 Toledo, Ocaña.



IES Eladio Cabañero,  
 Tomelloso



CES Ramón y Cajal,  
 Granada



IES Miguel Crespo,  
 Córdoba



IES José de Mora,  
 Baza



CEIP Ramón y  
 Cajal,  
 Pina de Ebro



Mriya School and the Science Basis School  
 Odesa and Kyiv,  
 Ukraine



IES Antonio  
 J. Cavanilles,  
 Alicante

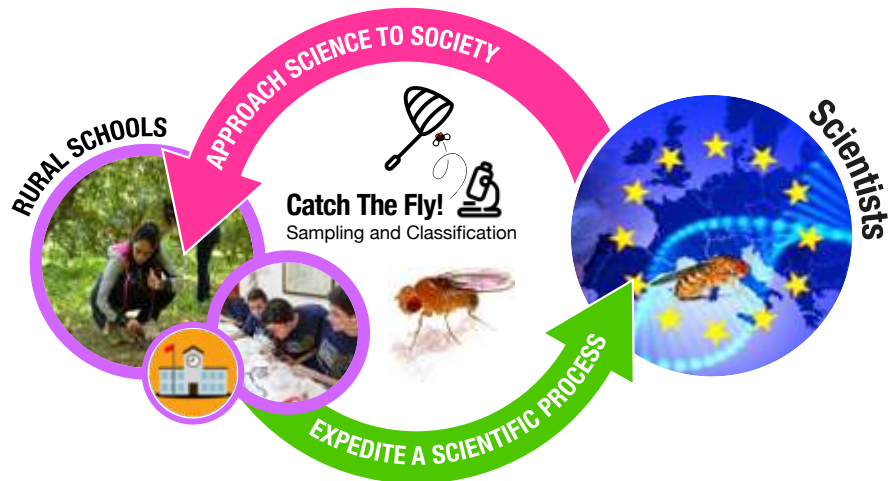


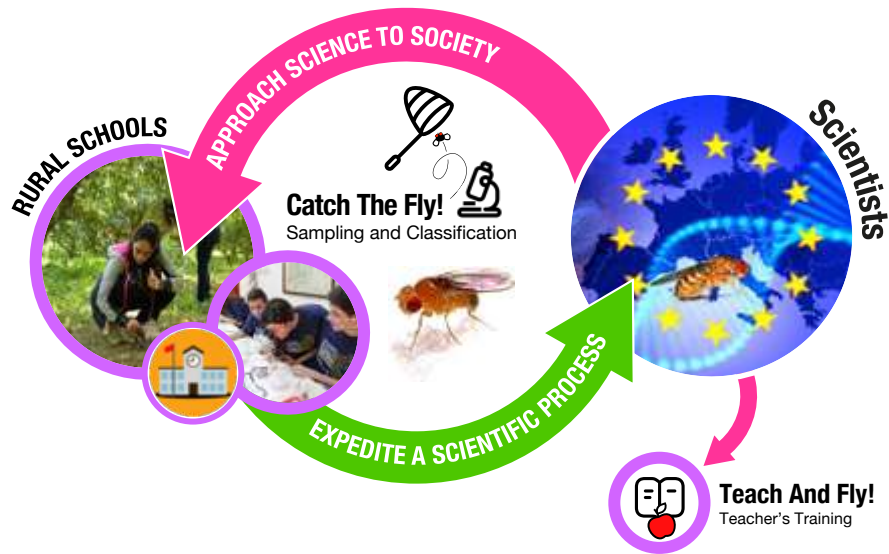
Justus-Von-Liebig-Schule  
 Waldshut-Tiengen, Germany

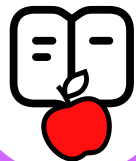


Jovan  
 Šerbanović  
 Primary school  
 Belgrade,  
 Serbia

2024: ~ 20 Schools in Spain, Germany, Ukraine, Serbia, Francia, Colombia and Honduras

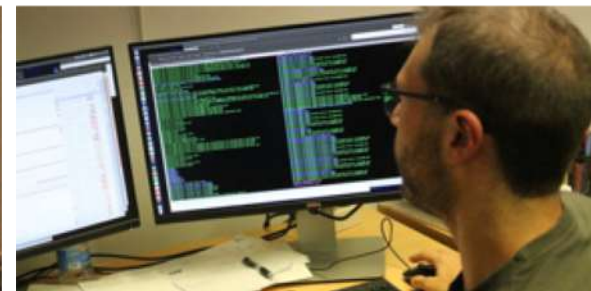


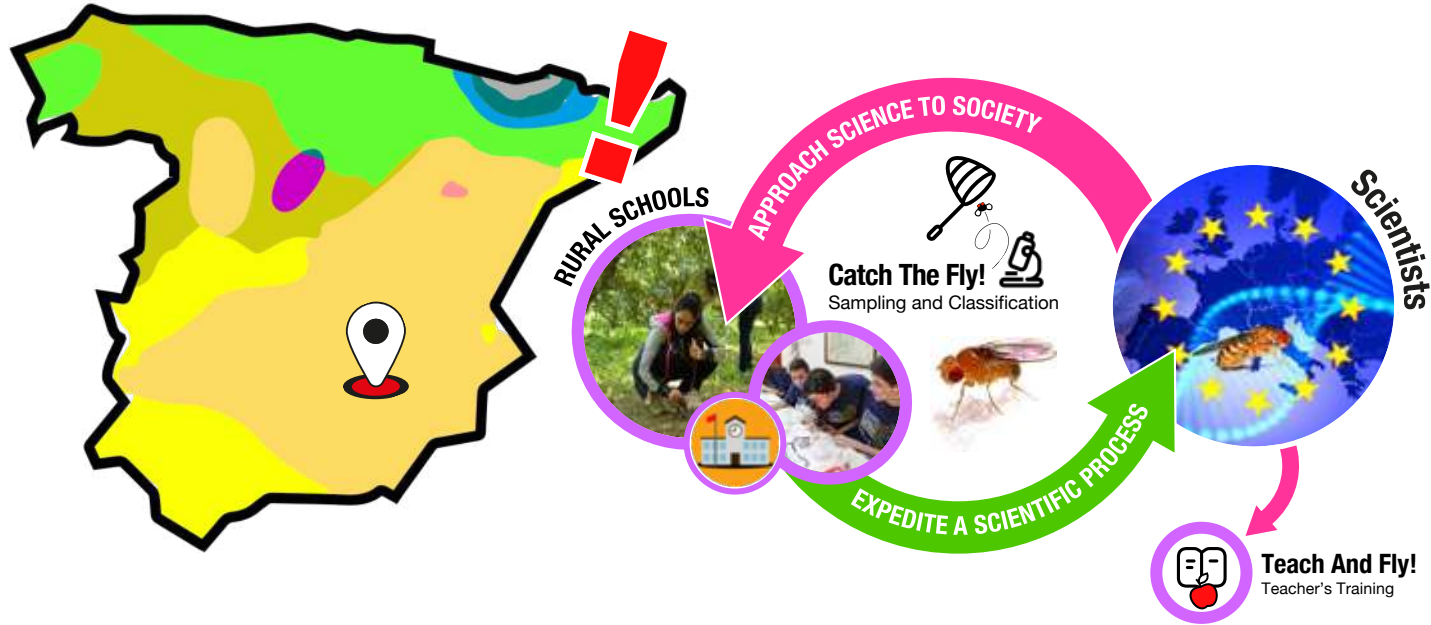


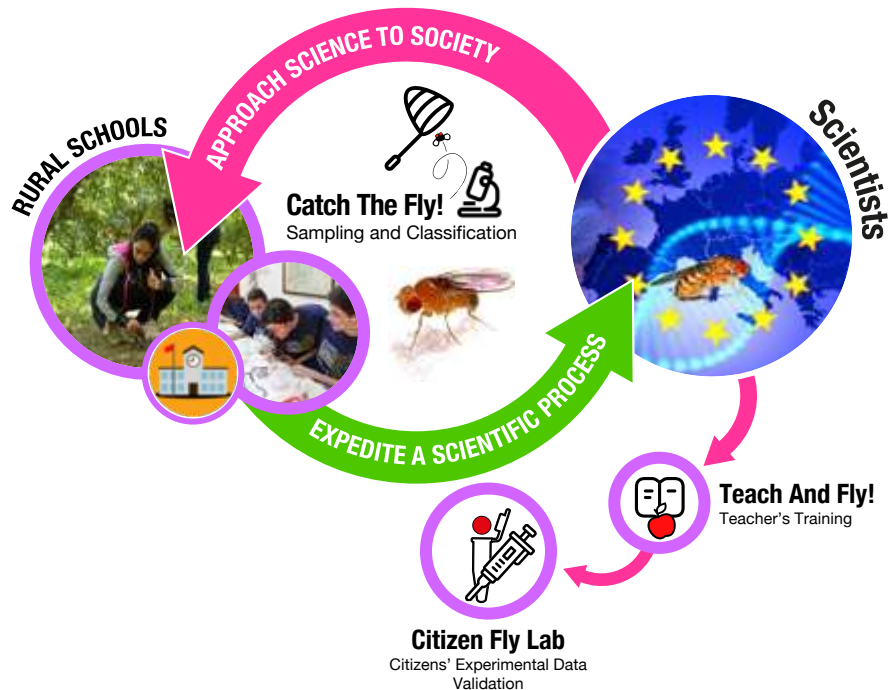


## Teach And Fly!

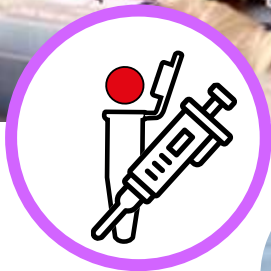
**TEACHER TRAINING.** To update and increase their **Epistemic knowledge**, understanding that the scientific knowledge base is constantly changing through the addition of new evidence.







Molecular biology for experimental data validation in class, to identify new transposons (**Procedural knowledge**)



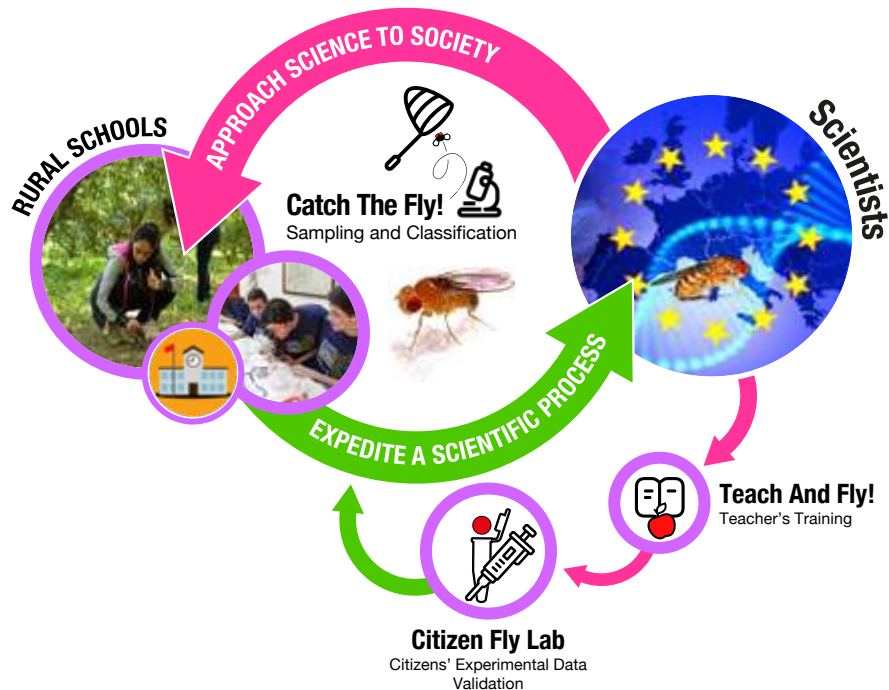
**Publicación:** Experimental Validation of Transposable Element Insertions Using the Polymerase Chain Reaction (PCR)

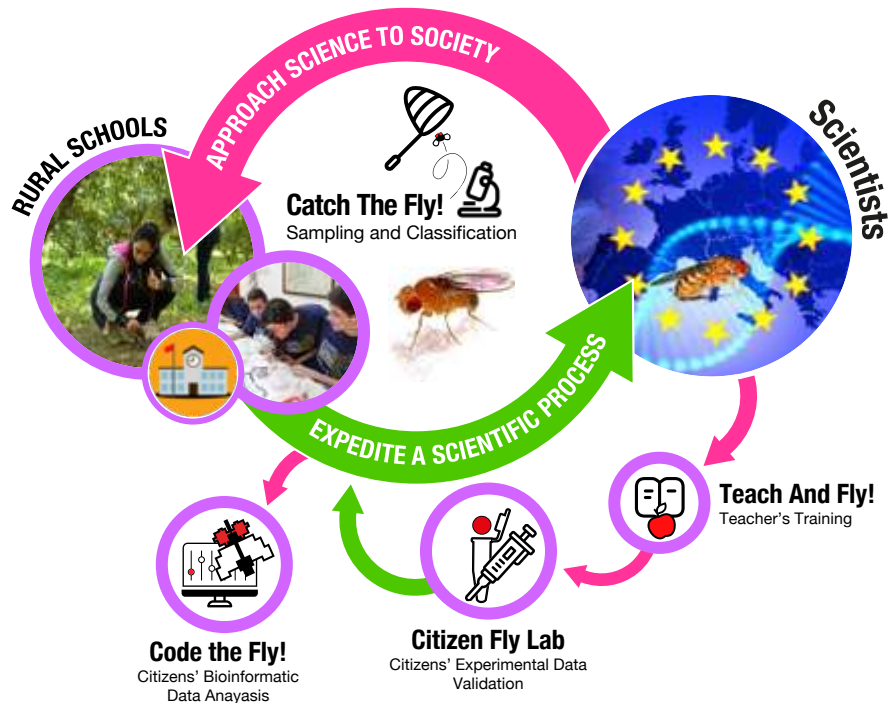
Miriam Merenciano <sup>1</sup>, Marta Coronado Zamora <sup>1</sup>, and Josefa González <sup>1</sup>  
<sup>1</sup> Institute of Evolutionary Biology (CSIC-UPF)

**Dra. Miriam Merenciano**  
Post-Doctoral researcher, Laboratoire de Biométrie et  
Biologie Évolutive (LBBE), Lyon, France  
(González Lab's Former member)



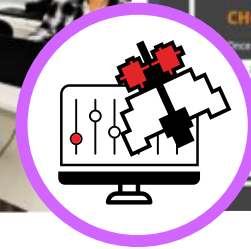
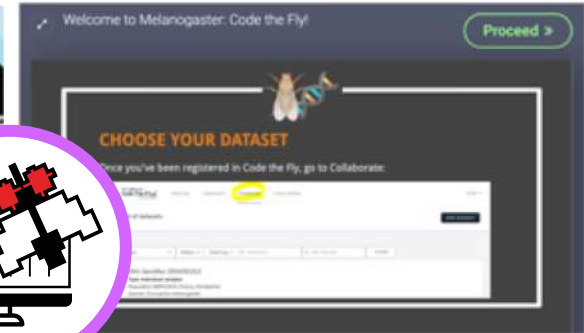








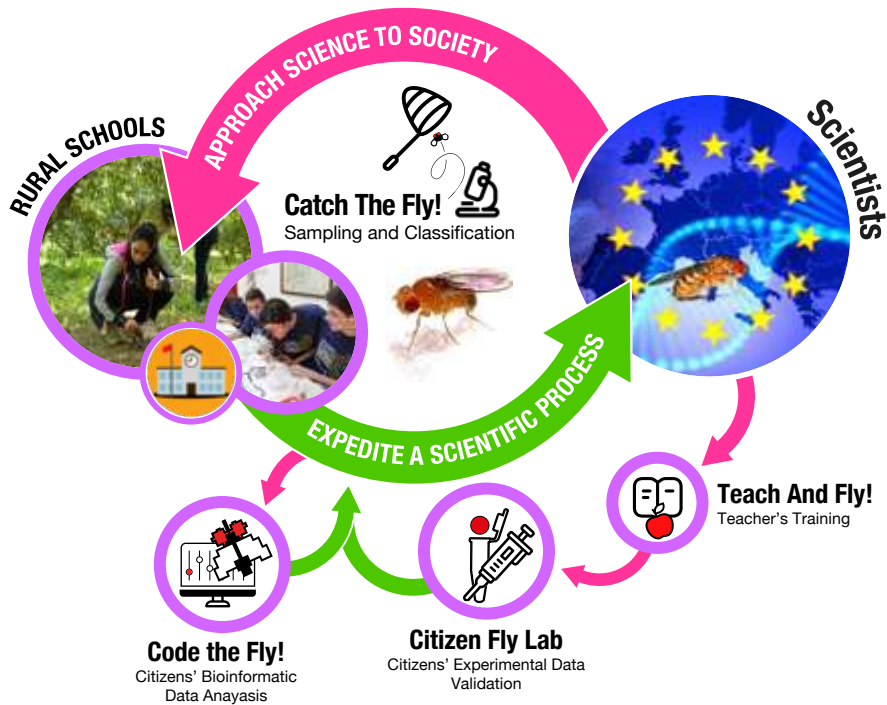
**Data analysis tools:** to observe variability within a population; and contributing to analyze DNA sequences to identify new Transposons; and formulating hypothesis.  
**(Procedural knowledge)**

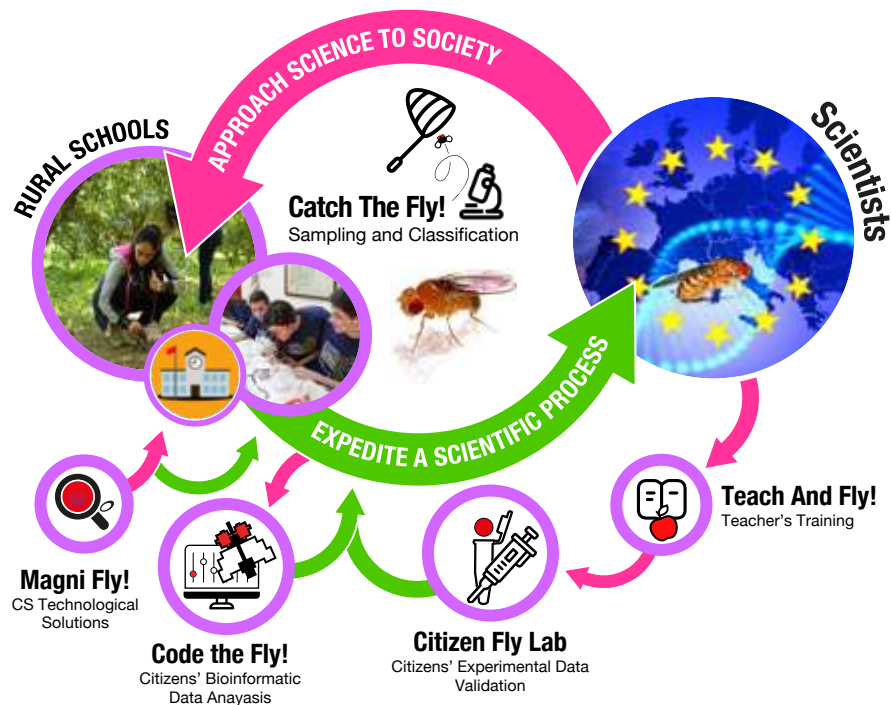


**Dr. Sònia Casillas**

Associate Professor and researcher in the Department of Genetics and Microbiology  
Faculty of Biosciences of the **Autonomous University of Barcelona**





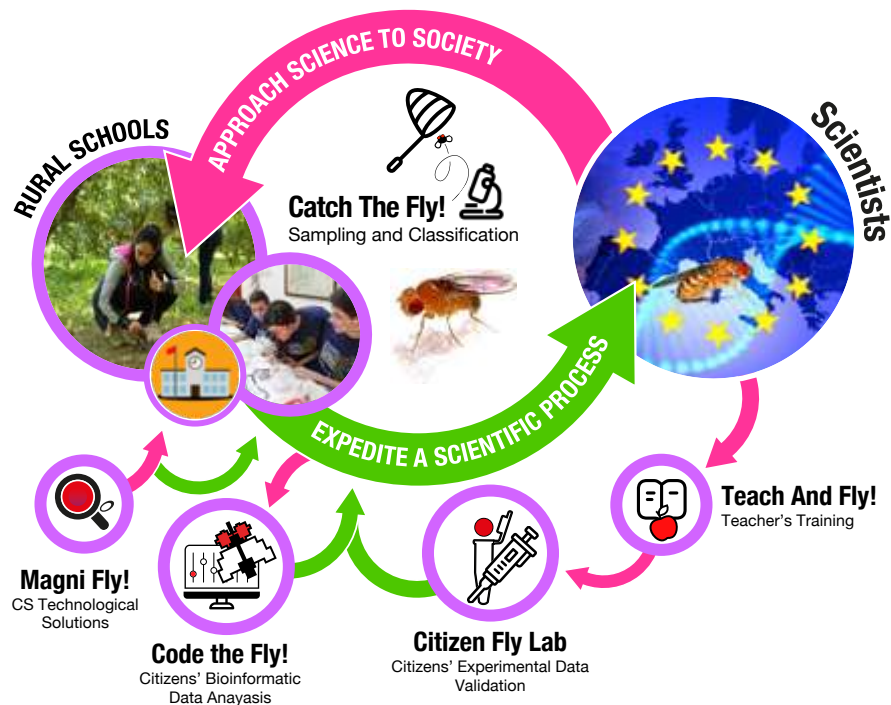


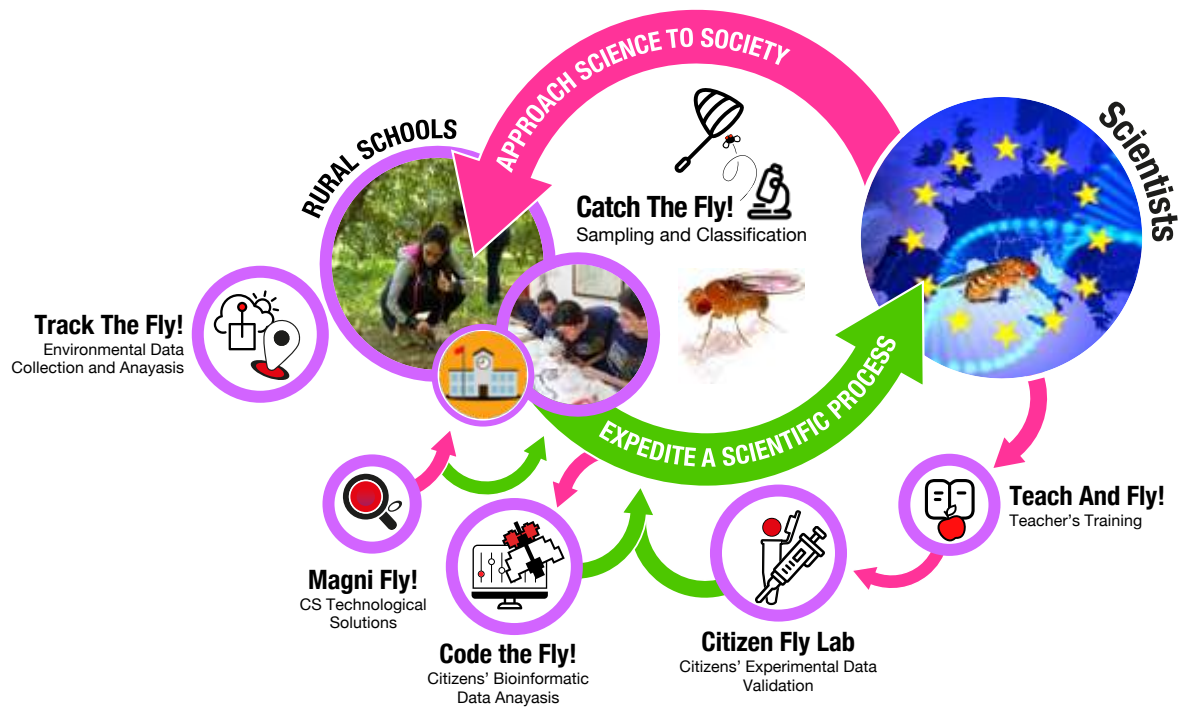


## Magni Fly! CS Technological Solutions



**Irene González**  
PhD Student Sida IrsiCaixa  
(González Lab's Former member)









**Monitoring of environmental variables, and correlations with the impact of climate change in local biodiversity.**



**Irene González**  
PhD Student Sida IrsiCaixa

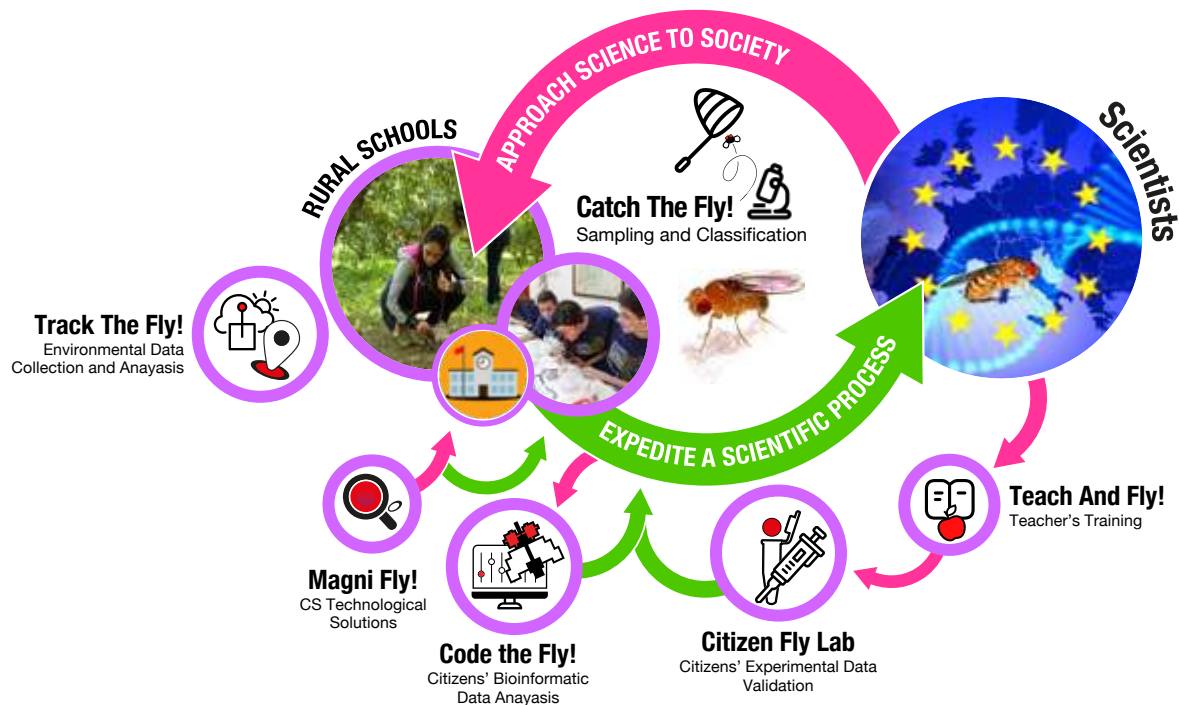


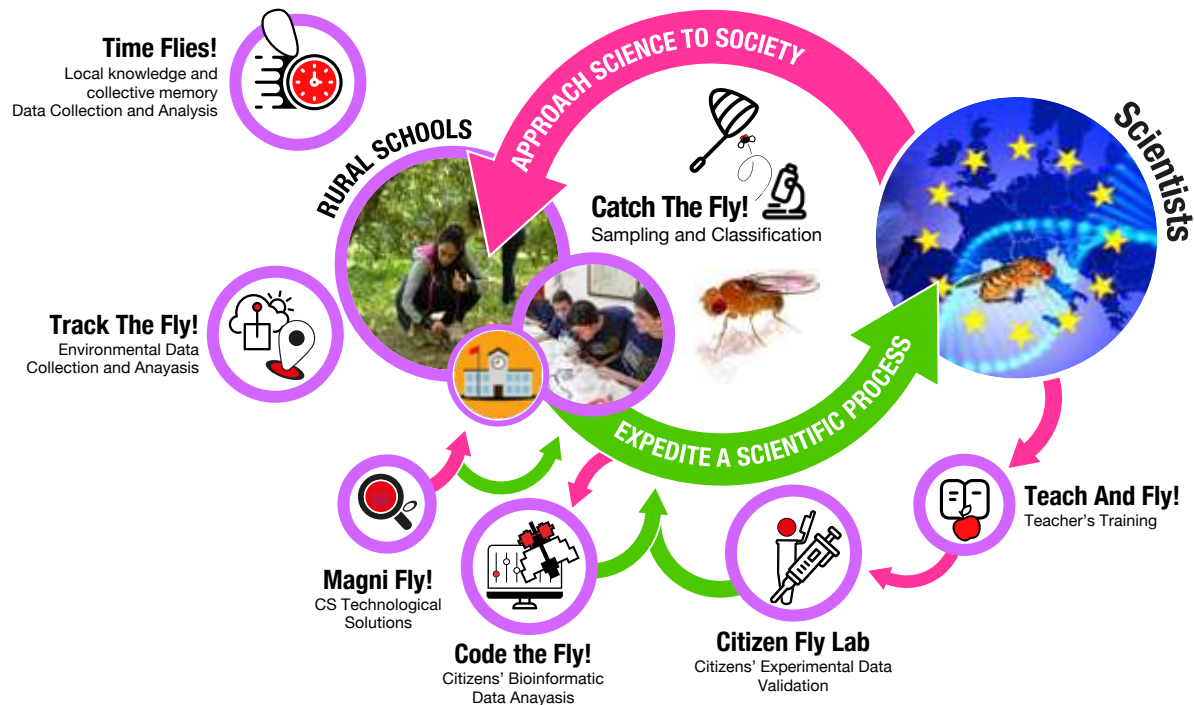
**Dr. Marta Coronado**  
Postdoctoral researcher  
Evolutionary and Functional Genomics Lab (CSIC)



**Federico Dallo,**  
Marie Skłodowska-Curie  
Postdoctoral Researcher, University of California, Berkeley







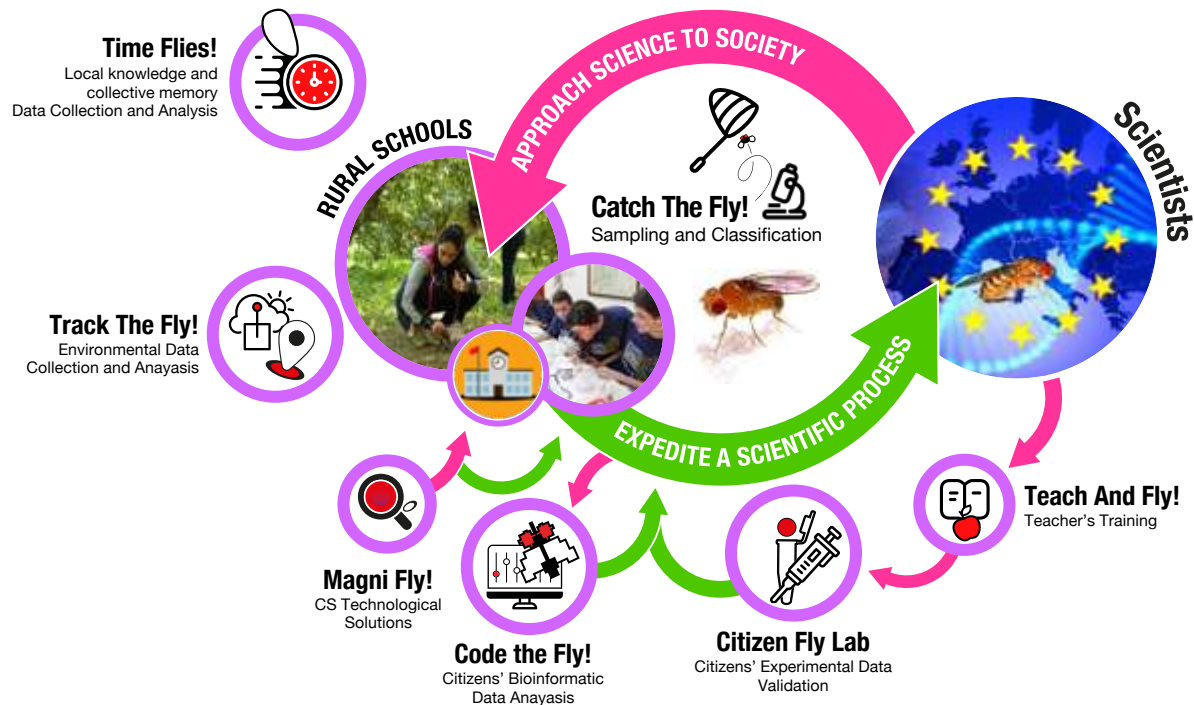


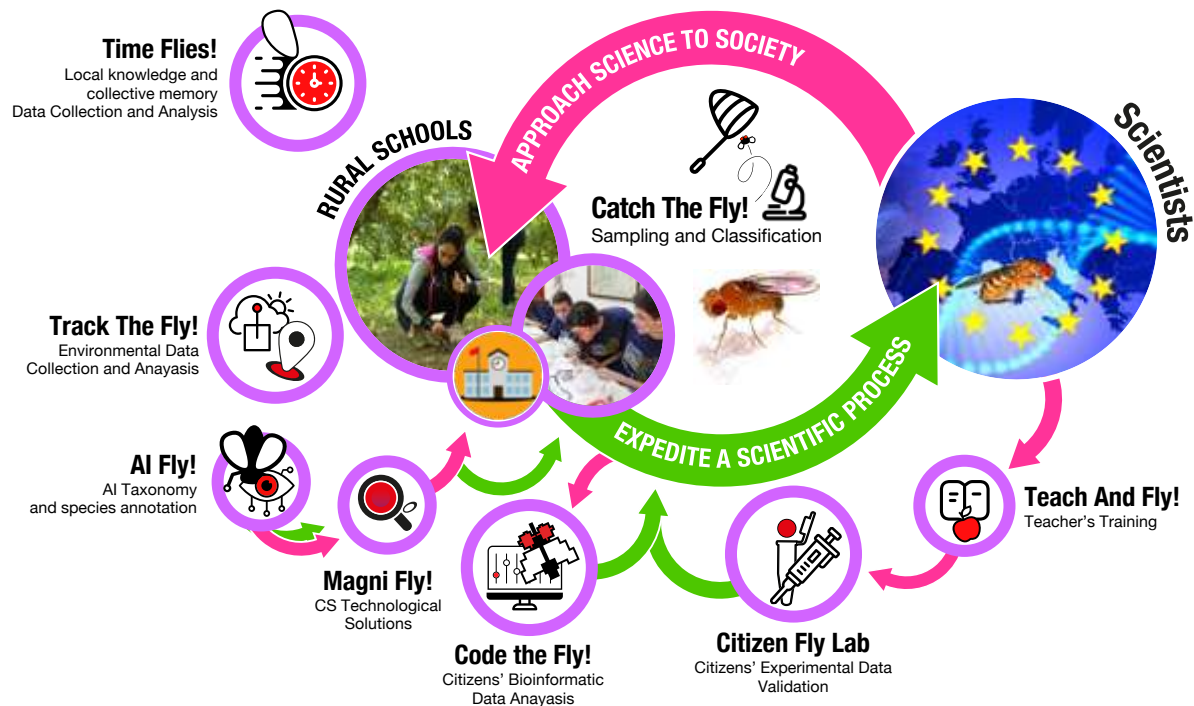
## Time Flies!

Local knowledge and collective memory Data Collection and Analysis



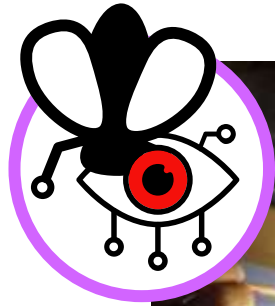
- *Changes in the environment of crop fields in recent years.*
- *The presence of nearby construction and increased vehicle traffic*
- *If farmers have chosen to modify the species they grow*
- *Irrigation practices to adapt to water availability*
- *Any changes in crop phenology and how this may affect production*



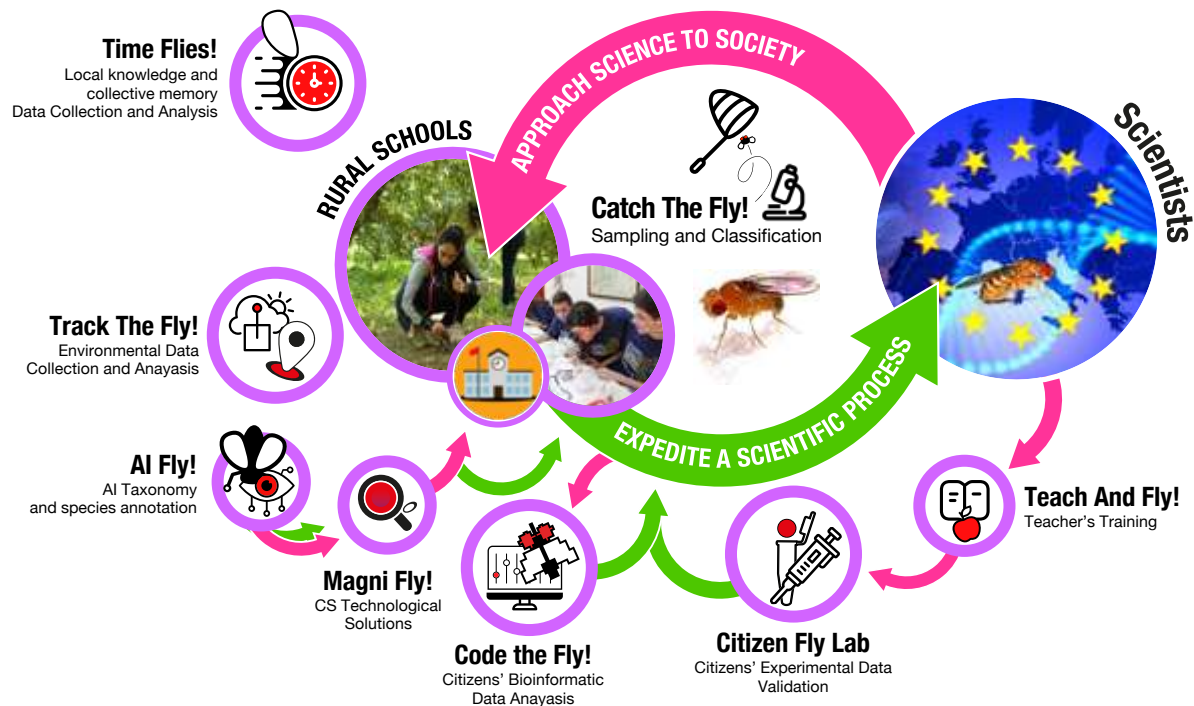


# AI Fly!

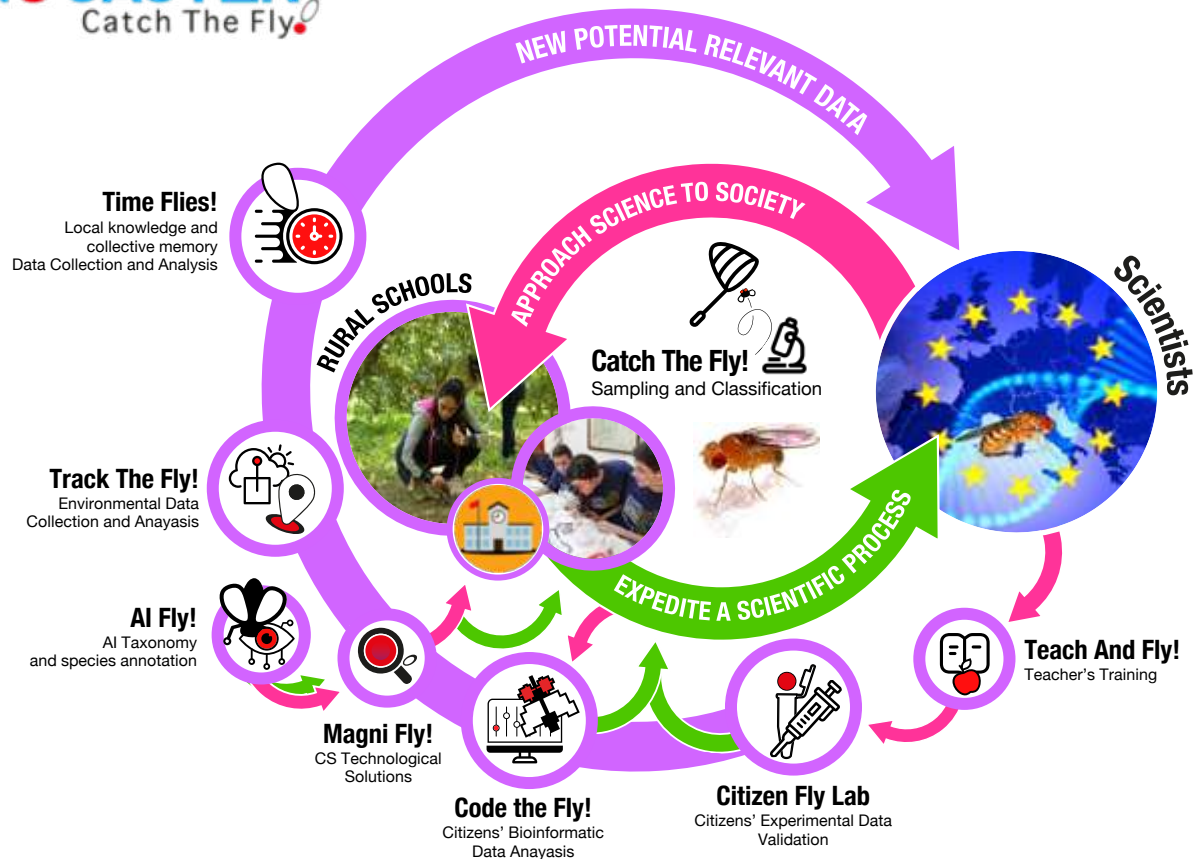
CS for AI Taxonomy  
and species annotation

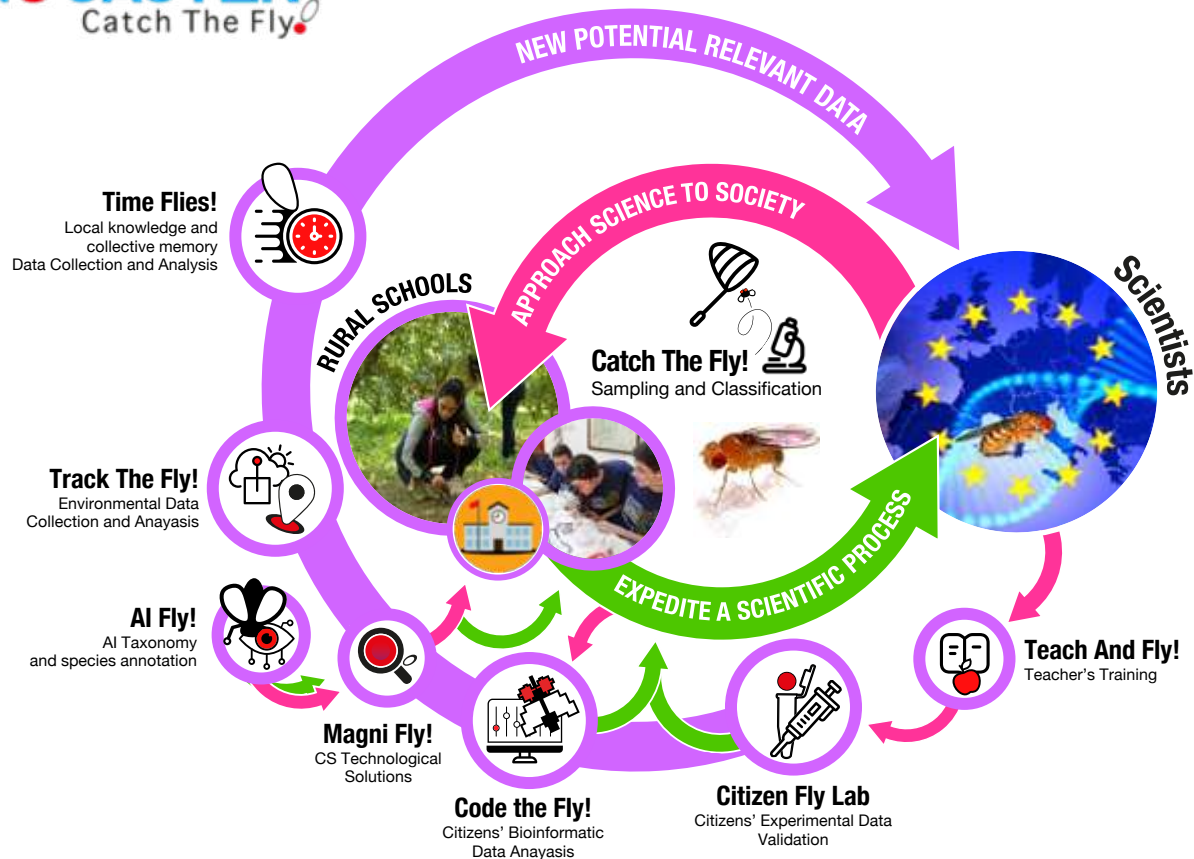


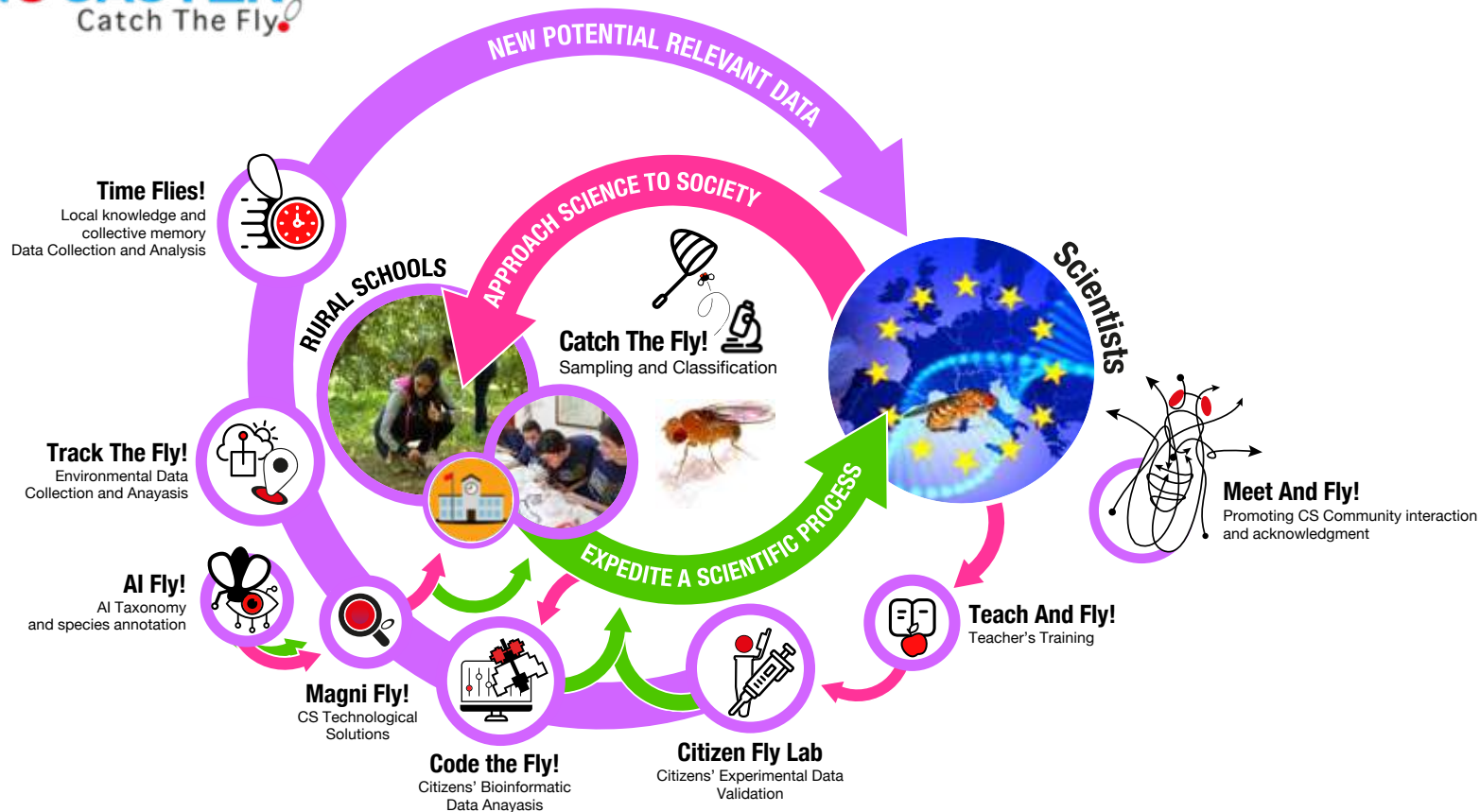
Using Image-based AI for Insect  
Monitoring & Conservation









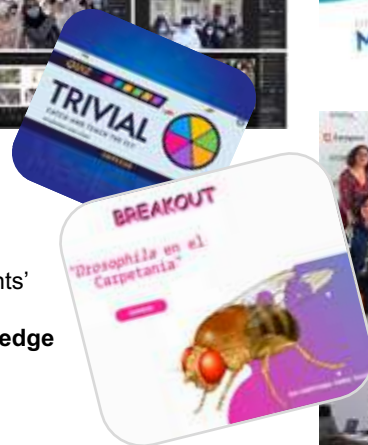




## Promoting CS Community interaction and acknowledgment

Communicating with participants, acknowledging participants' contributions, to maintain their interest, and creating social interactions. This contributes to promote **Epistemic knowledge** sharing data, knowledge and results.

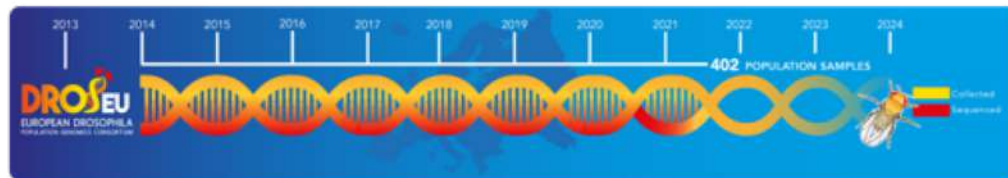
**Gamification:** Implement gamification of content and/or gamification of participation.





### ***Drosophila* Evolution over Space and Time (DEST) - A New Population Genomics Resource**

Martin Kapun<sup>1,2,\*</sup>, Joaquin C. B. Nunez<sup>3,\*</sup>, María Bogaerts-Márquez<sup>4,\*</sup>, Jesús Murga-Moreno<sup>5,6,\*</sup>, Margot Paris<sup>7,\*</sup>, Joseph Outten<sup>3</sup>, Marta Coronado-Zamora<sup>4,6</sup>, Courtney Tern<sup>3</sup>, Omar Rota-Stabelli<sup>8,6</sup>, Maria P. García Guerreiro<sup>5,6</sup>, Sònia Casillas<sup>5,6,8</sup>, Dorcas J. Orenge<sup>9,10,8</sup>, Eva Puerma<sup>9,10,8</sup>, Maaria Kankare<sup>11,8</sup>, Lino Ometto<sup>12,8</sup>, Volker Loeschcke<sup>13,8</sup>, Banu S. Onder<sup>14,8</sup>, Jessica K. Abbott<sup>15,6</sup>, Stephen W. Schaeffer<sup>16,8</sup>, Subhash Rajpurohit<sup>17,18,8</sup>, Emily L. Behrman<sup>17,19,8</sup>, Mads F. Schou<sup>13,15,8</sup>, Thomas J.S. Merritt<sup>20,8</sup>, Brian P. Lazzaro<sup>21,8</sup>, Amanda Glaser-Schmitt<sup>22,8</sup>, Eliza Argyridou<sup>22,8</sup>, Fabian Staubach<sup>23,8</sup>, Yun Wang<sup>23,8</sup>, Eran Tauber<sup>24,8</sup>, Svitlana V. Serga<sup>25,26,8</sup>, Daniel K. Fabian<sup>27,8</sup>, Kelly A. Dyer<sup>28,8</sup>, Christopher W. Wheat<sup>29,8</sup>, John Parsch<sup>22,8</sup>, Sonja Grath<sup>22,8</sup>, Marija Savic Veselinovic<sup>30,8</sup>, Marina Stamenkovic-Radak<sup>30,8</sup>, Mihailo Jelic<sup>30,8</sup>, Antonio J. Buendia-Ruiz<sup>31,8</sup>, M. Josefa Gómez-Julián<sup>31,8</sup>, M. Luisa Espinosa-Jimenez<sup>31,8</sup>, Francisco D. Gallardo-Jiménez<sup>32,8</sup>, Aleksandra Patenkovic<sup>33,8</sup>, Katarina Eric<sup>33,8</sup>, Marija Tanaskovic<sup>33,8</sup>, Anna Ullastres<sup>4,8</sup>, Lain Guio<sup>4,8</sup>, Miriam Merenciano<sup>4,8</sup>, Sara Guirao-Rico<sup>4,8</sup>, Vivien Horváth<sup>4,8</sup>, Darren J. Obbard<sup>34,8</sup>, Elena Pasyukova<sup>35,8</sup>, Vladimír E. Alatorsev<sup>35,8</sup>, Cristina P. Vieira<sup>36,37,8</sup>, Jorge Vieira<sup>36,37,8</sup>, J. Roberto Torres<sup>38,8</sup>, Iryna Kozeretska<sup>25,26,8</sup>, Oleksandr M. Maistrenko<sup>26,39,8</sup>, Catherine Montchamp-Moreau<sup>40,8</sup>, Dmitry V. Mukha<sup>41,8</sup>, Heather E. Machado<sup>42,43,8</sup>, Antonio Barbadilla<sup>5,6,8</sup>, Dmitri Petrov<sup>42,8</sup>, Paul Schmidt<sup>16,8</sup>, Josefa Gonzalez<sup>4,8</sup>, Thomas Flatt<sup>7,8</sup>, Alan O. Bergland<sup>3,8</sup>.



## Promoting scientific literacy in Evolution through citizen science

Brandt, Miriam<sup>11</sup>, Groom, Quentin<sup>12</sup>, Magro, Alexandra<sup>13,4</sup>, Misevic, Dusan<sup>15</sup>, Narraway, Claire L.<sup>16</sup>, Beniermann, Anna<sup>7</sup>, Børsen, Tom<sup>8</sup>, Bruckermann, Till<sup>9</sup>, **González, Josefa<sup>10</sup>**, Meeus, Sofie<sup>2</sup>, Roy, Helen E.<sup>11</sup>, Sá-Pinto, Xana<sup>12</sup>, **Torres Miranda, Roberto<sup>13</sup>**, Jenkins, Tania





Brussels, December 7th, 2022

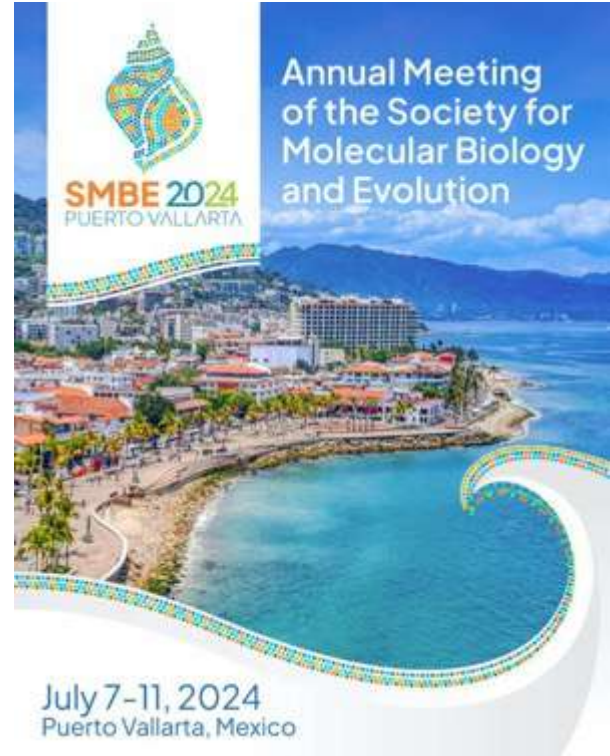


## Young people engage for the planet

IES Eladio Cabañero, Tomelloso (Spain) and Mriya School, Odessa (Ukraine)

# SCIENCE OUTREACH AND CITIZEN SCIENCE CSIC PRIZE

Premio en Ciencia Ciudadana  
2024 del CSIC





# CITIZEN SCIENCE ENGAGEMENT PRIZE



136 solicitudes de 54 países



**FALLING  
WALLS  
SCIENCE  
SUMMIT  
2024**

7-9 NOVEMBER  
BERLIN & DIGITAL



## Young people engage for the planet

IES Eladio Cabañero, Tomelloso (Spain) and Mriya School, Odessa (Ukraine)



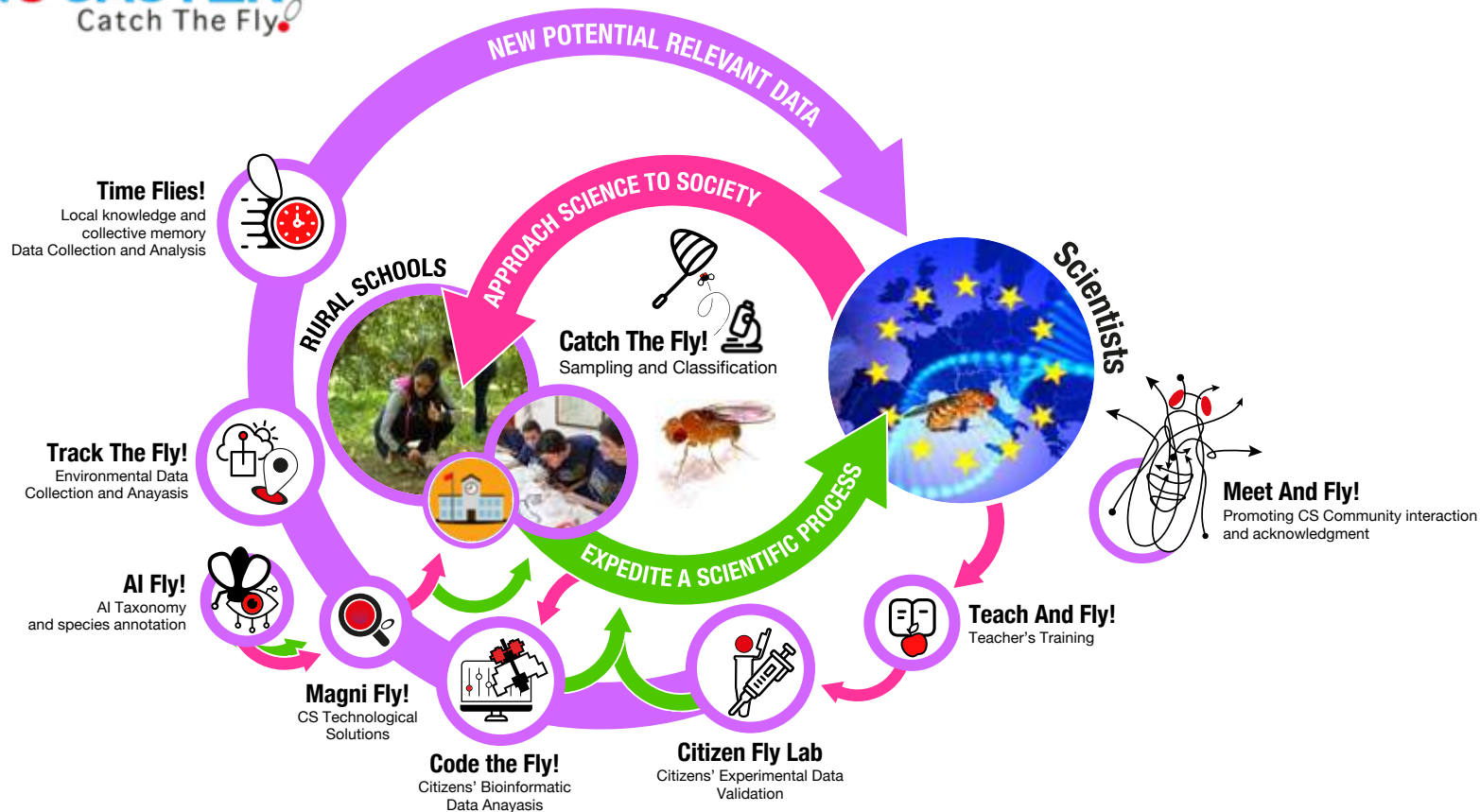
*Invitados y aspirantes  
Premio ERC participación pública  
en la investigación 2024*



Brussels, December 7th, 2022

Brussels, October 24th, 2024





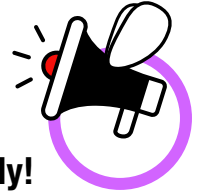




Prize podcast for scientific popularization of the University of Granada



Construction of entomological aspirators with recycled material



**Show The Fly!**  
Citizen Outreach and  
Dissemination



Seeking funding to implement their molecular biology lab #CitizenFlyLab



**CASTILLA LA MANCHA BEST PROJECT PRIZE  
IES ELADIO CABAÑERO (TOMELLOSO)**



## Show The Fly! Citizen Outreach and Dissemination



Darren J Obbard  
University of Edinburgh



Local outreach events organized by the schools, **"Tomelloso Virus" Presentation**

Dissemination of science and Drosophila as a model organism by schools



Carmen Arboledas  
High School Teacher  
CES Ramón y Cajal, Granada



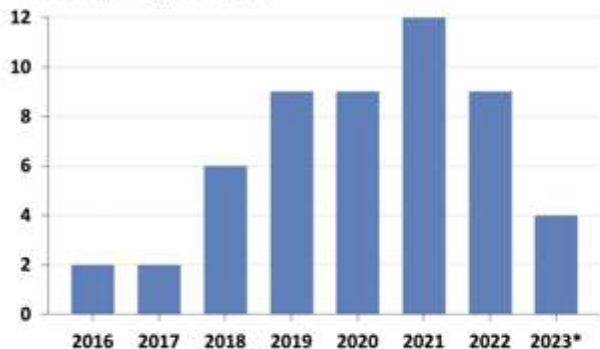
Outreach activities in Barcelona research center's Open Day, carried out by students.

DrosEu Meeting 2020

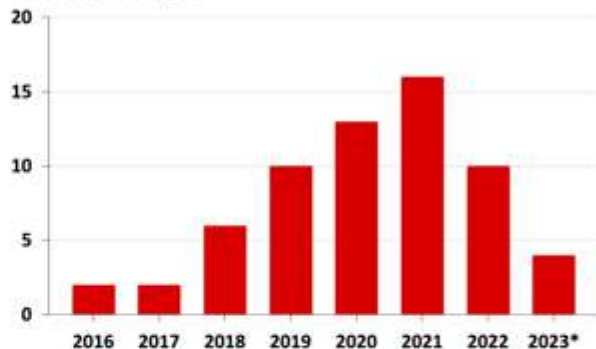


**18 Schools 63** Fieldwork trips and classification days

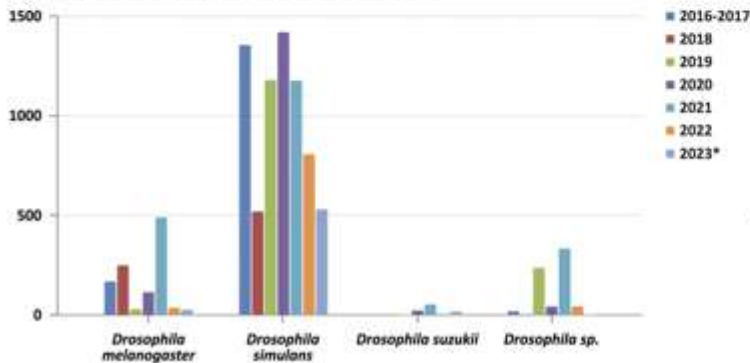
**Participating schools:**



**Fieldwork trips:**



**Samples per species of *Drosophila*:**



**~ 1,020 Participants**

With an average of 17 participating students per school and campaign



**~ 5,970 hrs**

invested in the project  
 by the community #MelanogasterCTF.

Average of 5.5 hours of work per student and 20 hours per teacher.

Approximately 47 hours per participating school.

***Drosophila* samples**

**8,879** flies collected and classified

\*The samples collected in 2023 are being processed, the figure will be updated in the coming months

NEW POTENTIAL RELEVANT DATA

APPROACH SCIENCE TO SOCIETY

EXPEDITE A SCIENTIFIC PROCESS

**Time Flies!**  
Local knowledge and  
collective memory  
Data Collection and Analysis

**Show The Fly!**  
Citizen Outreach and Dissemination

**Track The Fly!**  
Environmental Data  
Collection and Analysis

**AI Fly!**  
AI Taxonomy  
and species annotation

RURAL SCHOOLS

**Catch The Fly!**  
Sampling and Classification

Scientists

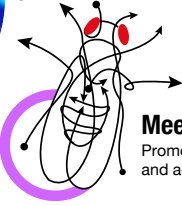
**Meet And Fly!**  
Promoting CS Community interaction  
and acknowledgment

**Teach And Fly!**  
Teacher's Training

**Magni Fly!**  
CS Technological  
Solutions

**Code the Fly!**  
Citizens' Bioinformatic  
Data Analysis

**Citizen Fly Lab**  
Citizens' Experimental Data  
Validation



CITIZEN SCIENCE

# MELANO GASTER

Catch The Fly!



- Citizens are contributing to an active research project that is advancing knowledge on adaptation genomics
- Scientists are communicating the research process and the value of basic research



**ROBERTO TORRES**



**DO NOT PATRONIZE YOUR  
AUDIENCE**



**PEER-TO-PEER  
COMMUNICATION IS  
POWERFUL**



Thanks! / ¡Gracias!



Josefa González, PhD  
Scientific direction



Roberto Torres  
Communications Director



María Bogaerts  
Scientific support



Miriam Mencliano, PhD  
Scientific support



Irene González  
Technological development



Marta Coronado  
Scientific suport



Sònia Casillas  
Code the Fly Director

CITIZEN SCIENCE  
**MELANOGASTER**  
Catch The Fly.

f x t #MelanogasterCTF

Roberto Torres  
LCATM, Creative Director  
rtorres@fruitfly.eu  
www.melanogaster.eu

With the collaboration of:



Partners:



Organizers:

