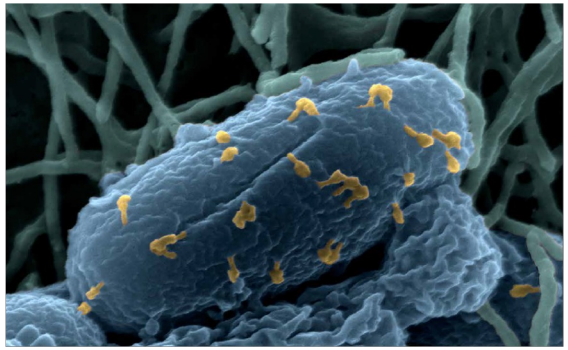
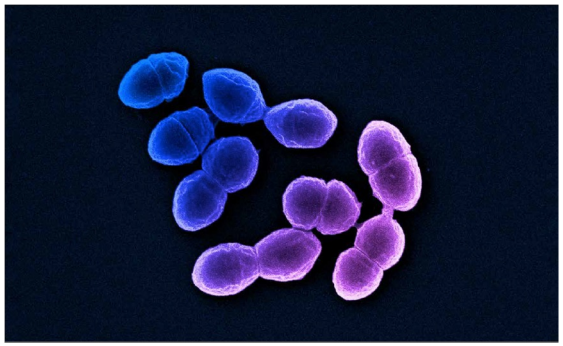
“Amazing microorganisms” photo exhibition and other tools: how to map the real knowledge of civil society and interact with it in terms of microbiological literacy

Giovanna Cristina Varese, Elisa Moscato, Valeria Prigione, Giulia Fornaro, Stefania Stecca, Valeria Tigini, Alessia Guerretta, Federico Feroldi, Nicoletta Marengo, Alice Martinetto, Federico Bonatoand Iolanda Perugini.

cristina.varese@unito.it

ECC | European Culture Collections' Organisation

Photography as a tool to increase knowledge

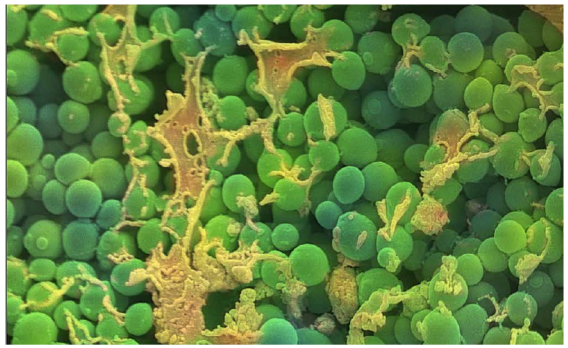
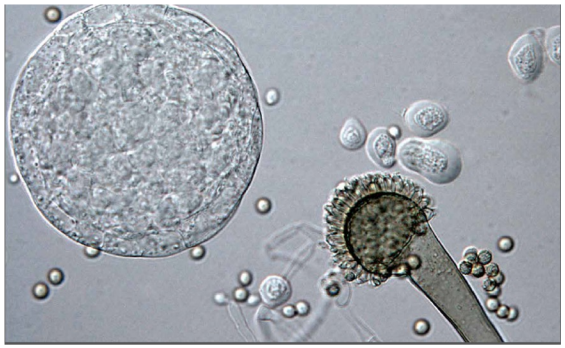
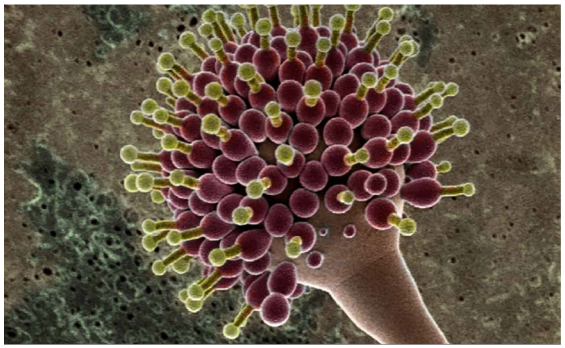




Image after image, visitors discover an extraordinary world that amazes for the combination of visual beauty and microbial genius developed over billions of years of competition for survival.

The winner of the photo exhibition in Turin - ECCO 2019

Microrganismi straordinari
Amazing microorganisms

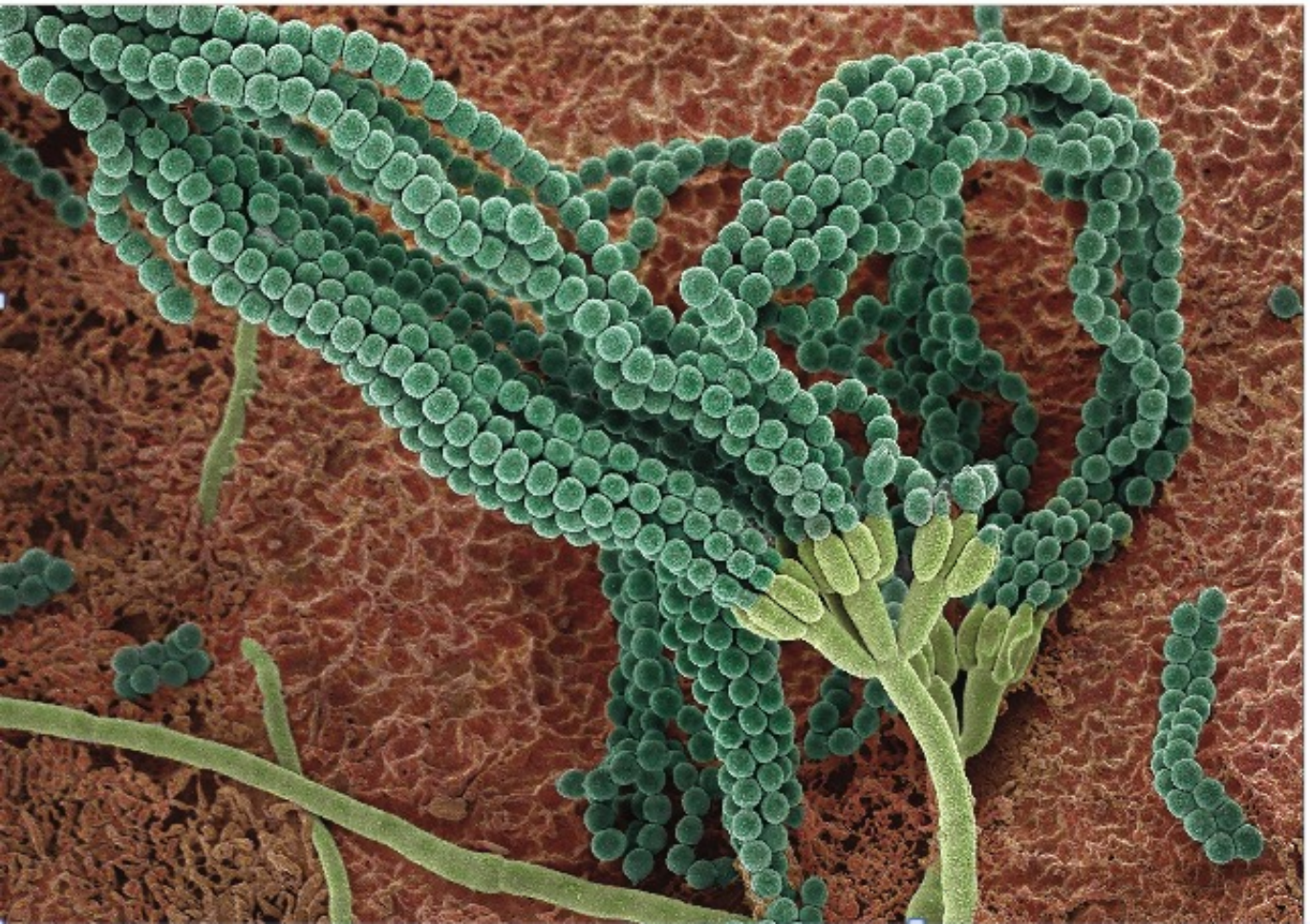
Università degli Studi di Torino

Dipartimento di Scienze della Vita e Biologia dei Sistemi

European Culture Collections' Organisation

Fondazione CRT

Penicillium chrysogenum

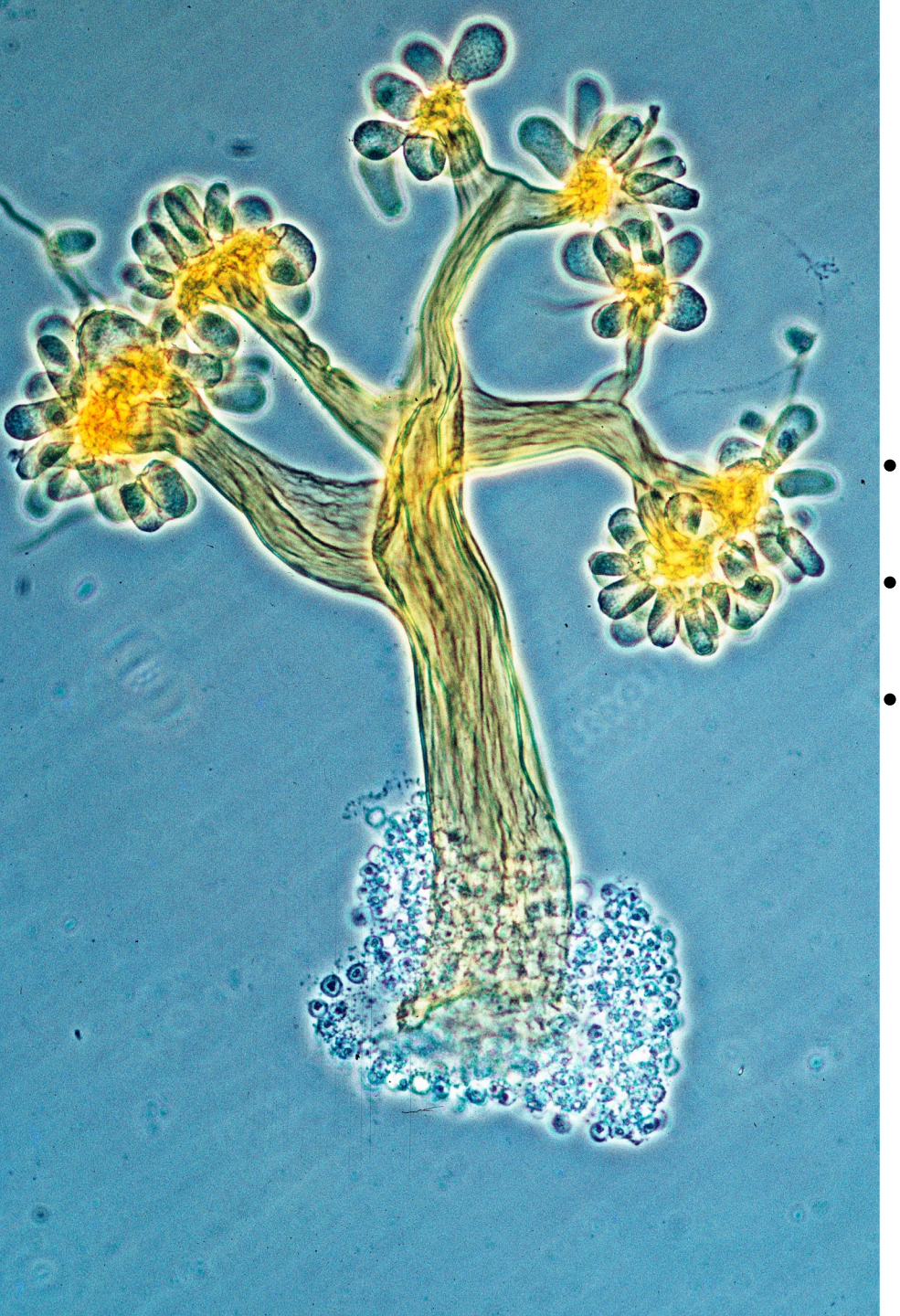


FUNGHI FILAMENTOSI - *FILAMENTOUS FUNGI*

La fama di Penicillium chrysogenum risale al 1928, quando A. Fleming ha scoperto la penicillina, il primo antibiotico della storia. Altre specie del genere Penicillium sono utilizzate per la produzione di formaggi e salumi; alcune causano i marciumi della frutta (arance, mele).

Penicillium chrysogenum has been known since the discovery by A. Fleming in 1928 of penicillin, the first antibiotic. Other species of the genus Penicillium are used to produce cheeses and salami; others are responsible for rot on fruits as some citrus or apple.

Credit: © Westerdijk Fungal Biodiversity Institute, Utrechts, Nederlands

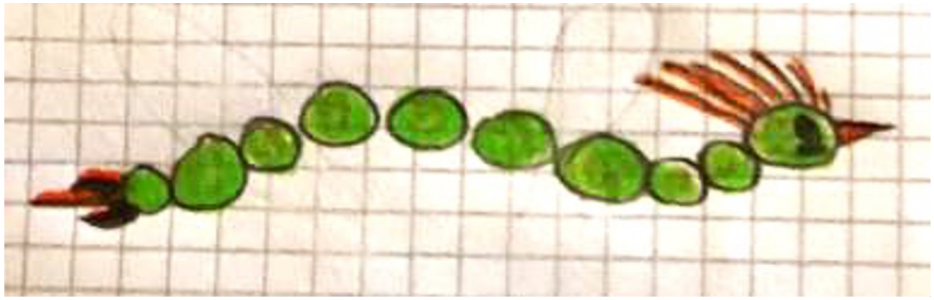


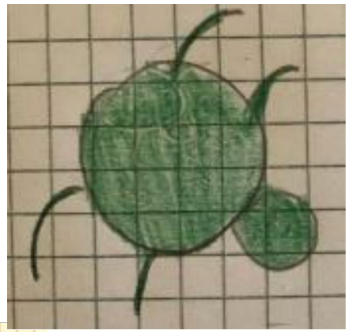
Why a photo exhibition?

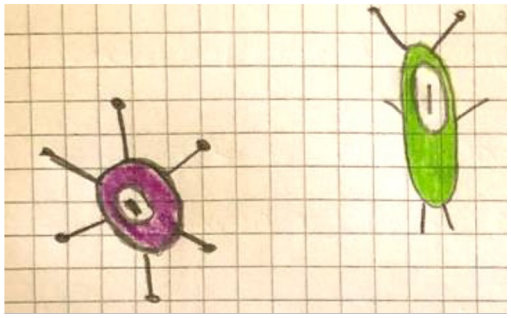
- Microorganisms are beautiful
- Very small (1 µm = 1/1000 of mm)
- Never seen by most of the world population

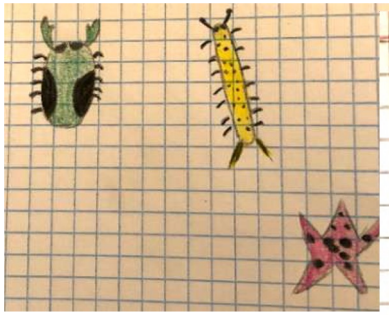
People get scared by what cannot see!

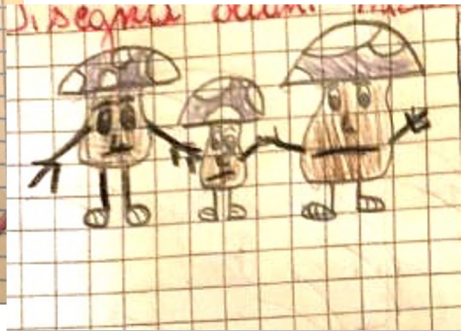
How middle school kids imagine microorganisms

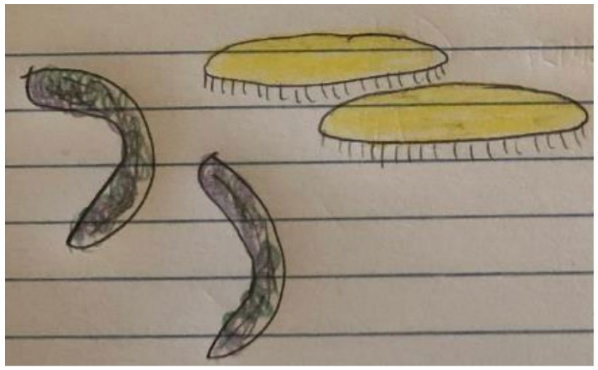












Microorganisms represented with unreal, anthropomorphized traits and associated with negative aspects of our life.

https://jcom.sissa.it/archive/19/07/JCOM_1907_2020_A08

Prejudice and fear against microorganisms increased after SARS-CoV-2

What is essential is invisible to the eye… it is only with the heart *(and the microscope)* that one can see rightly!

Microbial biodiversity is considered a valuable resource for science and industry, with implications for the economy and finance

https://www.nature.com/articles/s41564-020-00857-w?utm_source=xmol&utm_medium=affiliate&utm_content=meta&utm_campaign=DDCN_1_GL01_metadata

The lack of microbiological knowledge in civil society strongly influences daily decisions and actions.

This lack of awareness affects policy makers, the business world and how we all will be able to face the great challenges of society.

The microbiological literacy of civil society is essential to ensure virtuous behavior and to allow innovations to be understood, marketed and adopted.

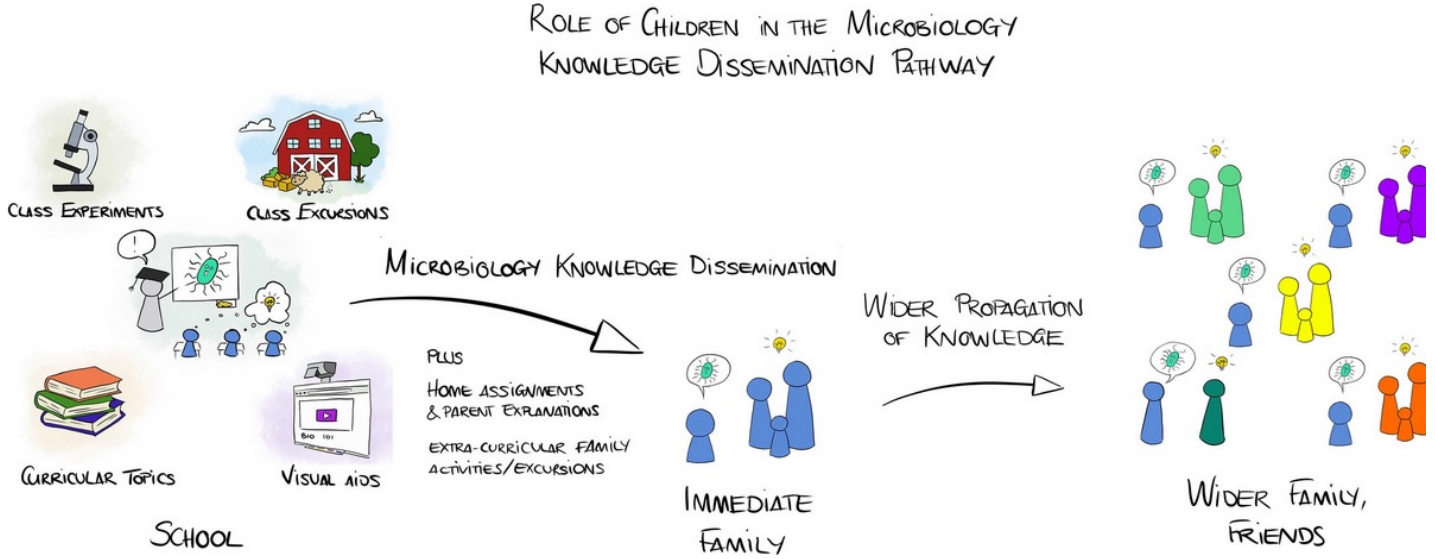


Photo Exhibit as Microbiological literacy tool

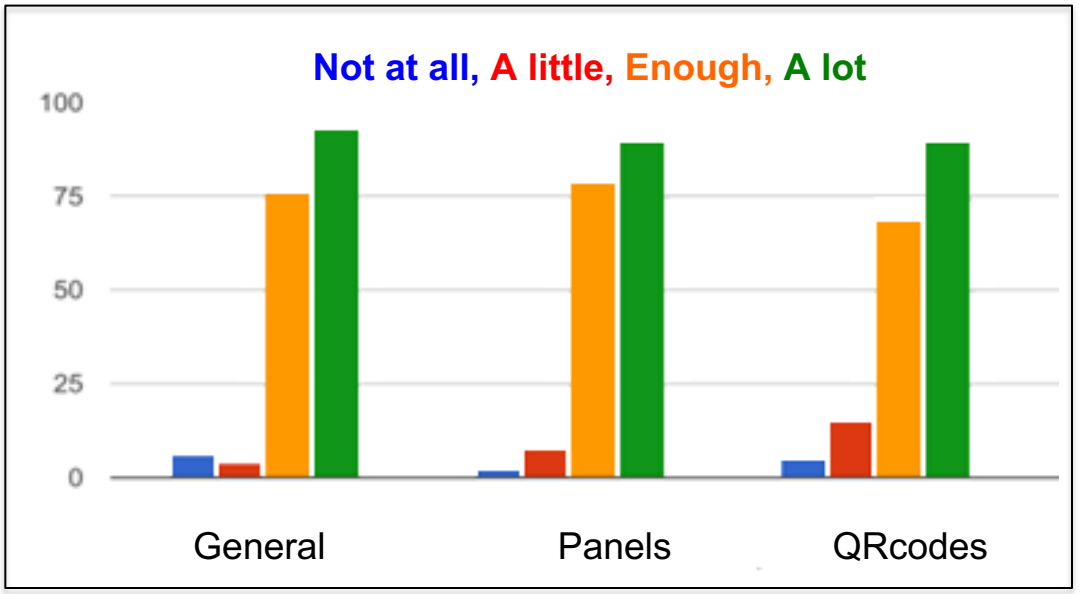
- Involve civil society;
- Overcome prejudice on microorganisms;
- Highlight their role for our planet.

Set up for the 38° ECCO meeting in Torino in 2019.

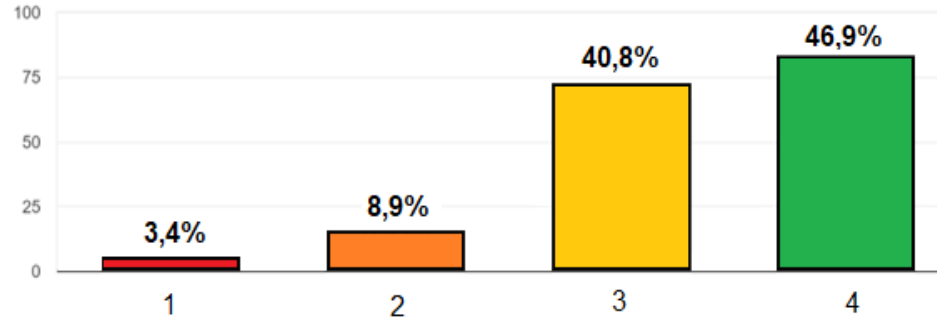
Updated in 2021 with the addition of 30 Qrcodes panels

Qrcodes to increase interactions with the visitors and map their microbiological knowledge.

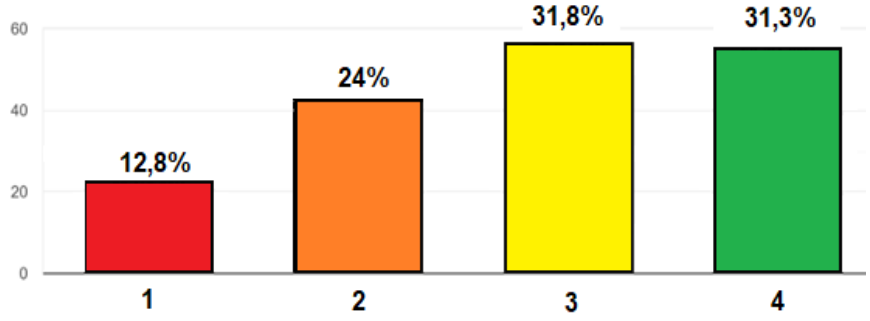
High customer satisfation of the exhibit



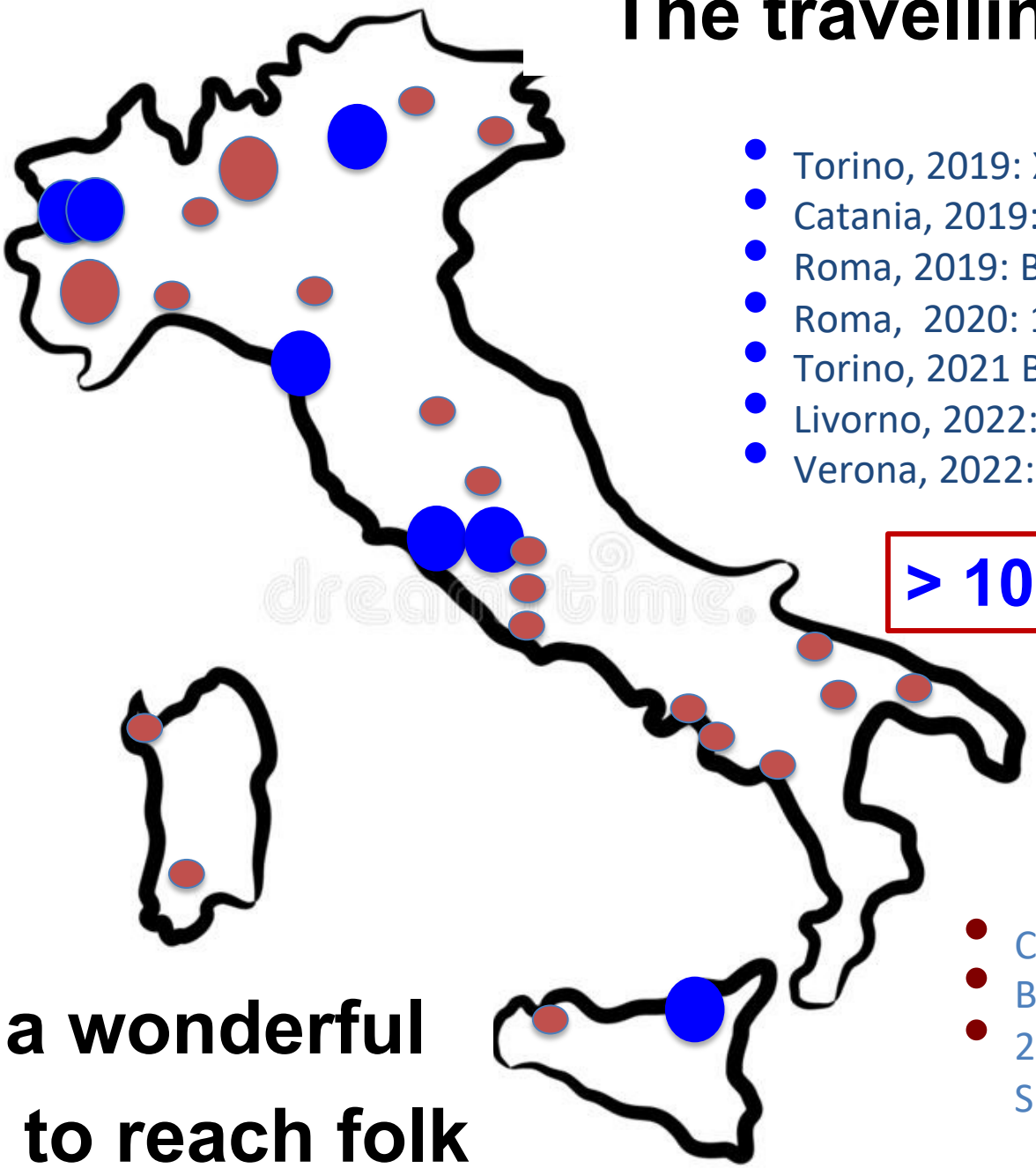
Did you learn new info?



Was you vision about microorganisms partially changed?



The travelling exhibit…



- Torino, 2019: XXXVIII ECCO
- Catania, 2019: 5th Microbial Diversity
- Roma, 2019: Botanical garden
- Roma, 2020: 15th ECFG
- Torino, 2021 Botanical garden
- Livorno, 2022: CIBM
- Verona, 2022: Veronetta Festival

> 10.000 visitors

- Cuneo, 2022: U-night
- Bergamo: work in progress
- 24 cities of the project SUS-MIRRI.IT

… a wonderful tool to reach folk

Did Qrcode map lay society knowledge?

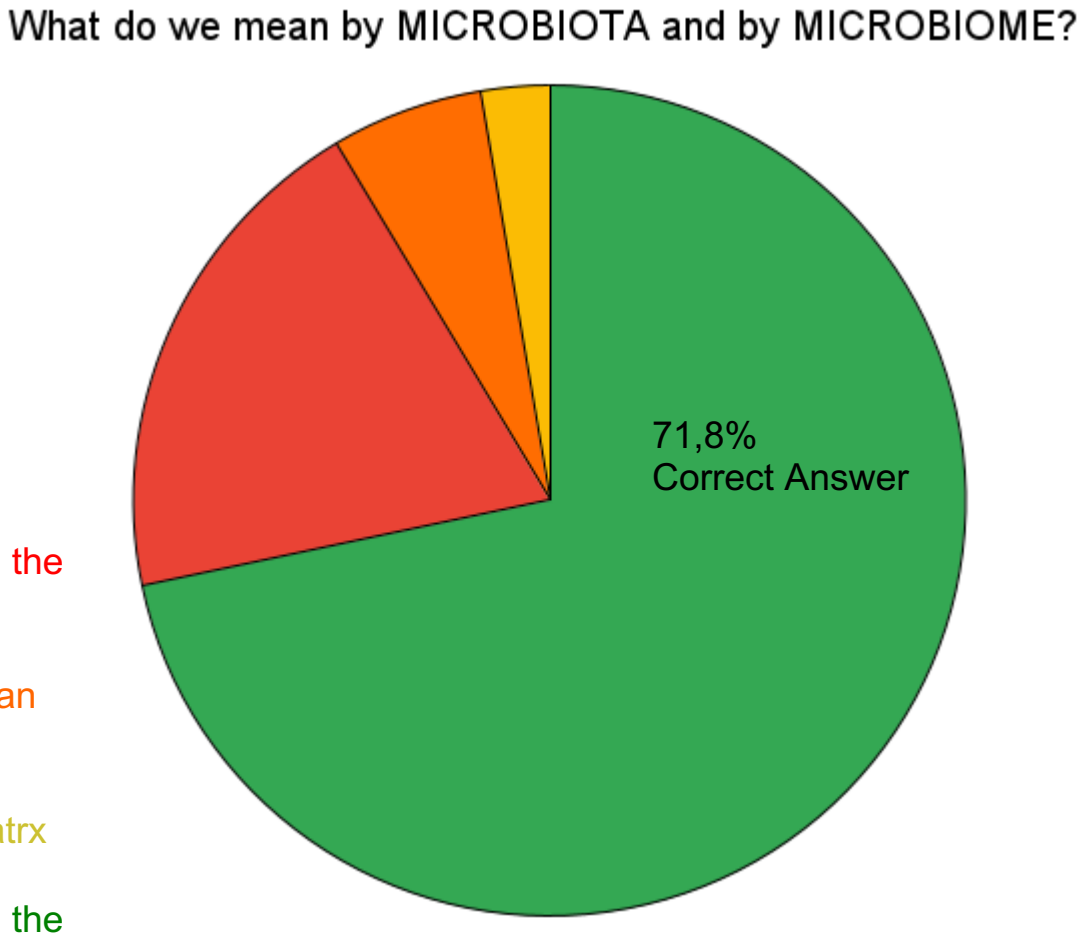
Too many correct answers!

Microbiota or Microbioma?

Scansiona il QR code e scoprilo con noi!

Seguici su instagram!
MICOTECA_TORINO

Seguire le indicazioni per proseguire il percorso



Proposed answers:

- The MICROBIOMA is the microbial population that colonizes a matrix, while the MICROBIOTA is its genetic patrimony
- They are synonymous and indicate the microbial population that colonizes human body
- They are synonymous and indicate the microbial population that colonizes a matrx
- The MICROBIOTA is the microbial population that colonizes a matrix, while the MICROBIOMA is its genetic patrimony

Probiotic or Prebiotic?

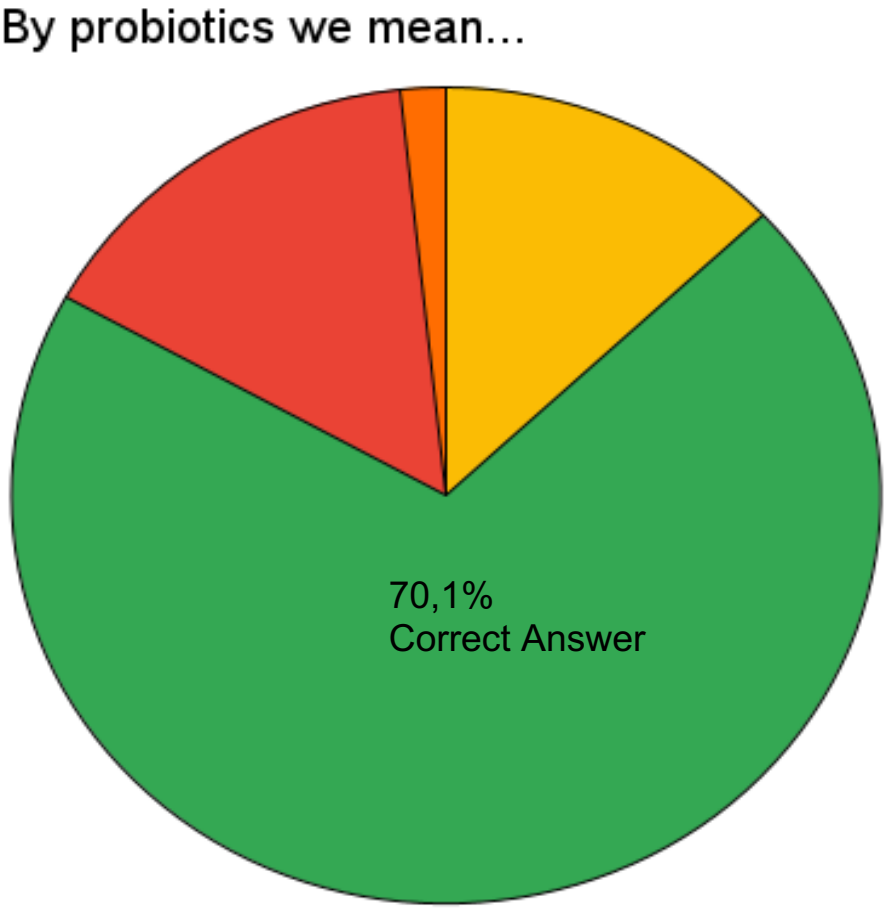
Scansiona il QR code e scoprilo con noi!

Seguici su instagram!
MICOTECA_TORINO

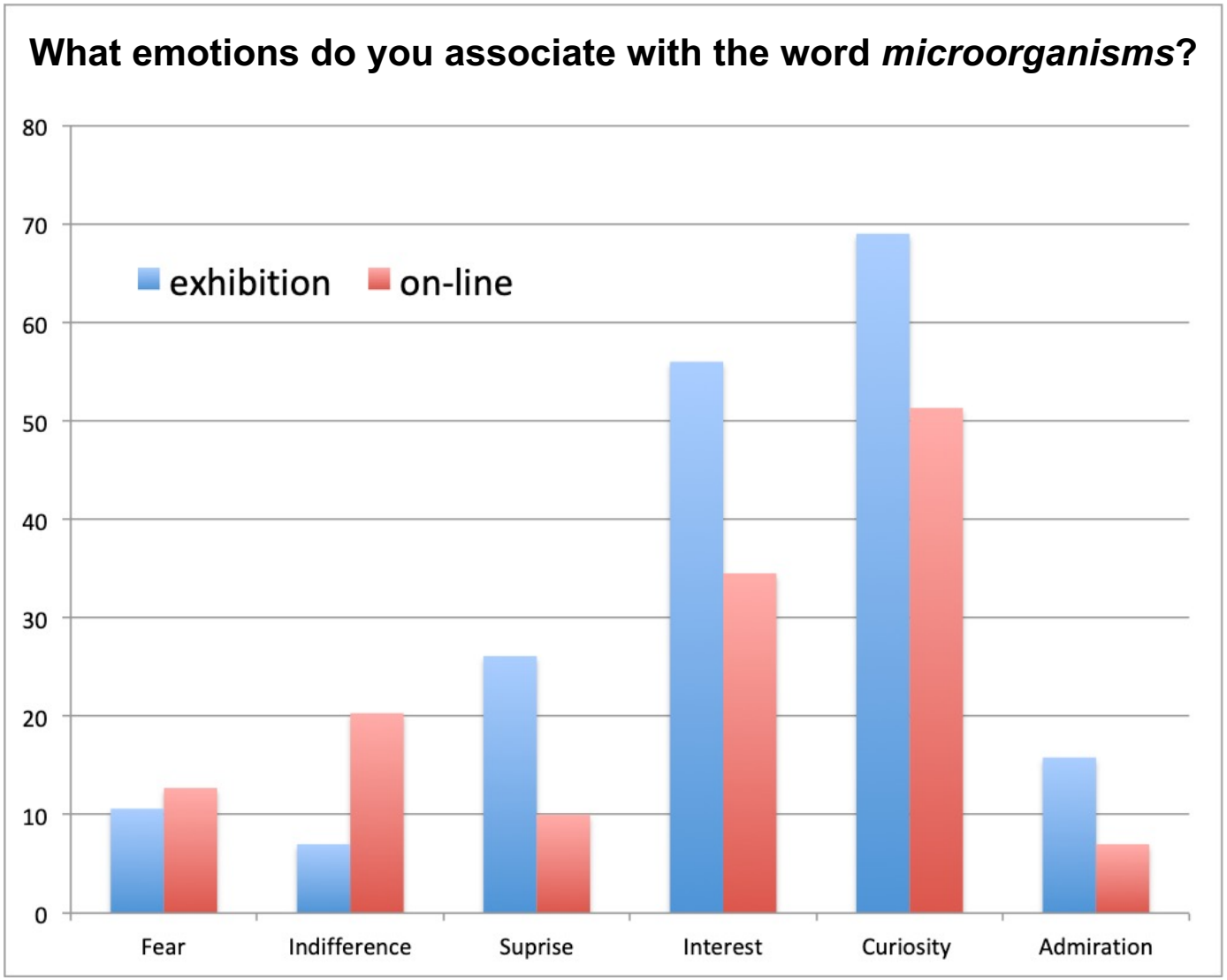
Seguire le indicazioni per proseguire il percorso

Proposed answers:

- Food that promotes the growth of beneficial intestinal microorganisms
- Medicines
- Organisms capable of treating human diseases
- Food containing living microorganisms useful for human health

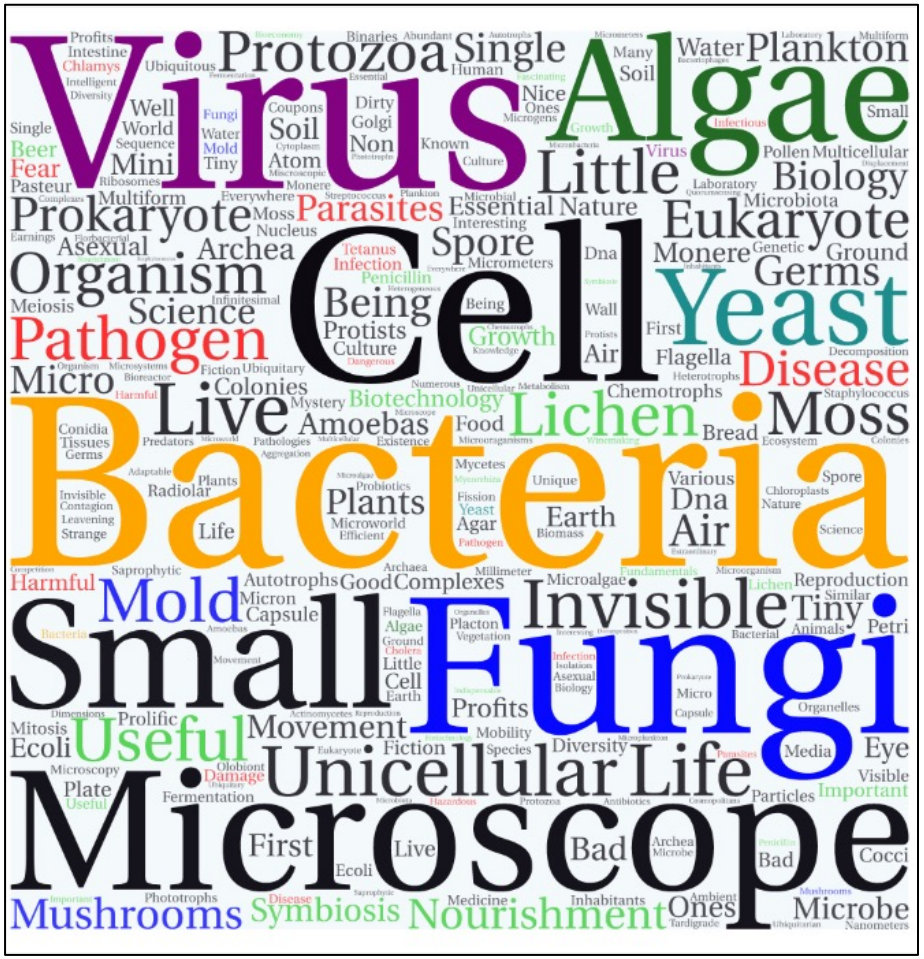


On-line *vs* exhibit survey



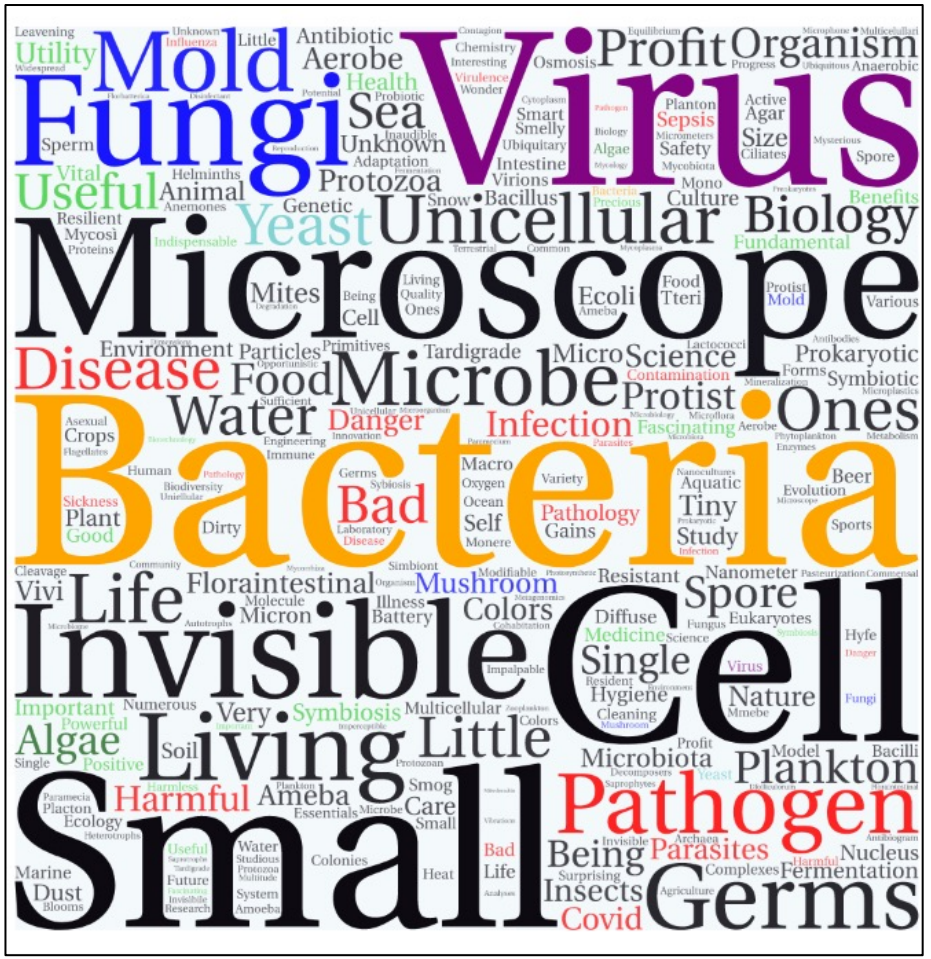
The exhibition positively influenced visitors

The most used words linked to *microorganisms*



Exhibition survey:

- higher awareness of Algae, Yeast and Symbioses
- more positive words (light green)



On-line survey:

- Algae and Yeast neglected
- more negative words (red)

Lesson learned and future perspectives

The exhibition is a useful tool for microbiological literacy and QR codes are highly appreciated by visitors, but improper to assess the microbiological background of folk.

- **the travelling exhibit will continue** and the local organizers can engage people with different strategies.
- **the school is a privileged customer**: training teachers has a huge cascading effect on students.

To respond to a specific request from teachers, UNITO is creating a virtual tour:

- info of the exhibit will be permanently available on-line;
- translate the tour in different languages;
- we are creating a working group to develop other tools (escape rooms, game…);
- focus and specific topics according to the request of the different schools;
- update the info.

scan the QRcode and start your virtual tour

How to assess the real microbiological background of people

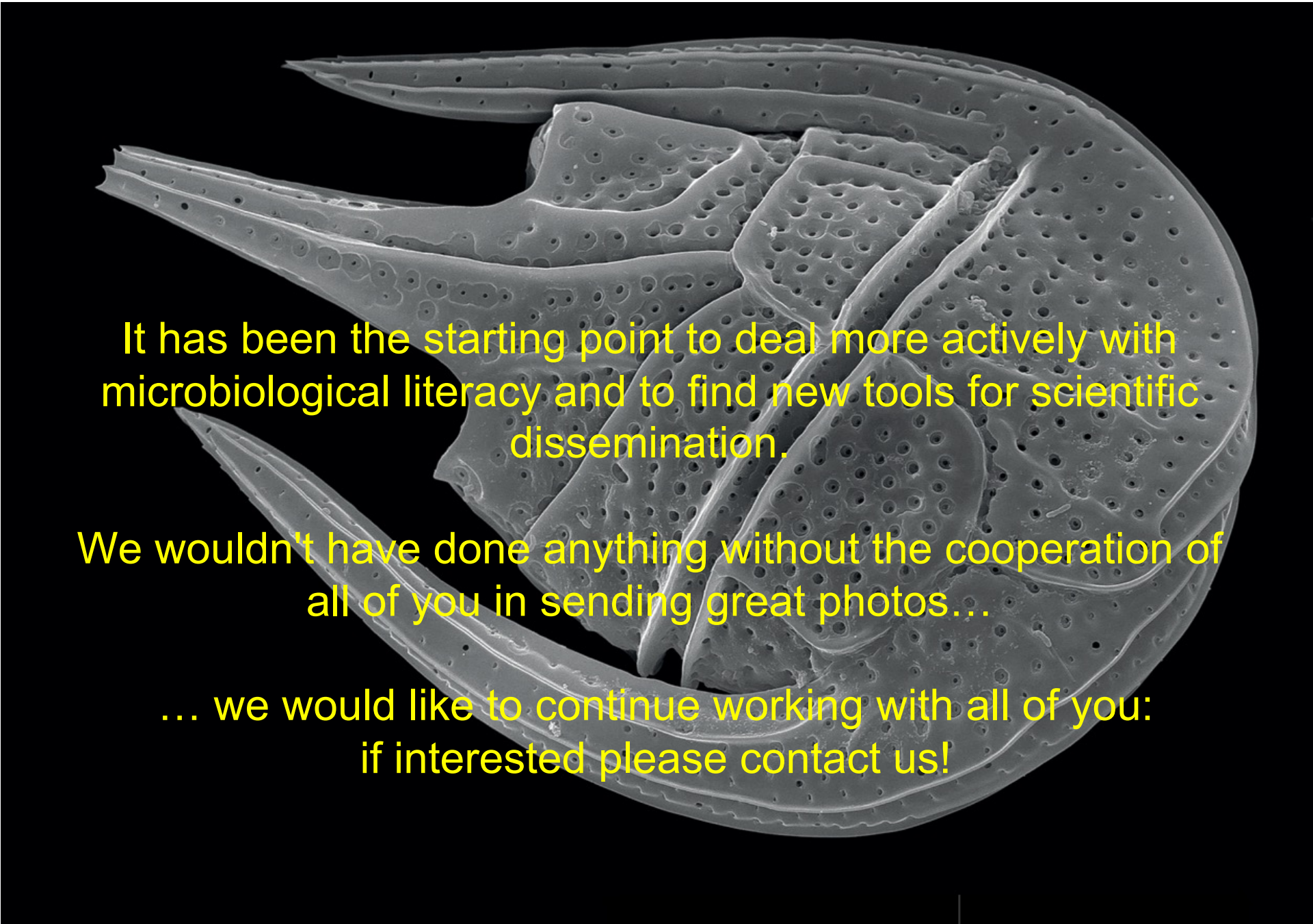
- Qrcodes in the exhibit have some drawbacks;
- Surveys on-line seem to be a good option to quickly engage a very large and diversified audience;

NEW ON-LINE SURVEYS FOR PEOPLE

Create a working group with different skills (microbiologists, teachers, psychologists) to develop 1 or more customized questionnaires for different stakeholders;

Process data to identify cultural gaps and then develop the most suitable strategies to fill the gaps.

The ECCO photo exhibit



It has been the starting point to deal more actively with microbiological literacy and to find new tools for scientific dissemination.

We wouldn't have done anything without the cooperation of all of you in sending great photos…

… we would like to continue working with all of you:
if interested please contact us!

THANK YOU

Photo credits

- *Agro-Food Microbial Culture Collection (ITEM), Institute of Sciences of Food Production of the National Research Council (ISPA CNR), Bari, Italy*
- *Banco Español del Algas (BEA), University of LasPalmas, Spain*
- *Centre for Agriculture and Bioscience International (CABI), Wallingford, UK*
- *Colección Española de Cultivos Tipo (CECT),*
- *University of Valencia, Spain Dept. of Agronomy, University of Sassari, Italy*
- *Dept. of Biotechnologies, University of Verona, Italy*
- *Dept. of Environmental Biology, University of La Sapienza, Roma, Italy*
- *Dept. of Life, Health and Environmental Sciences, University of L'Aquila, Italy Dept. of Life Sciences and Systems Biology (DBIOS), University of Torino, Italy*
- *Helmholtz Centre for Infection Research, Braunschweig, Germany*
- *Institut Pasteur, Paris, France*
- *Institute of Ecology and Genetics of Microorganisms (IEGM), Perm, Russia*
- *Institute for Biological Resources and Marine Biotechnology of the National Research Council (IRBIM CNR), Messina, Italy*
- *Institute for Sustainable Plant Protection of the National Research Council (IPSP CNR), Torino, Italy*
- *Leibniz Institute DSMZ-German Collection of Microorganisms and Cell Cultures*
- *Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Rome, Italy*
- *Mycotheca Universitatis Taurinensis (MUT), University of Torino, Italy*
- *National Collection of Yeast Cultures (NCYC), Norwich, UK*
- *Roscoff Culture Collection, Biological Station of Roscoff, France*
- *SAG Culture Collection of Algae, University of Göttingen, Germany*
- *School of Agriculture, Forest, Food and Environmental Sciences, University of Basilicata, Potenza, Italy*
- *Westerdijk Fungal Biodiversity Institute, Utrechts, Nederlands*