



European  
Commission

# MICROCOKIT: Microbial Community based Sequence Analysis linked to Anthropogenic Pressures to address the Water Quality

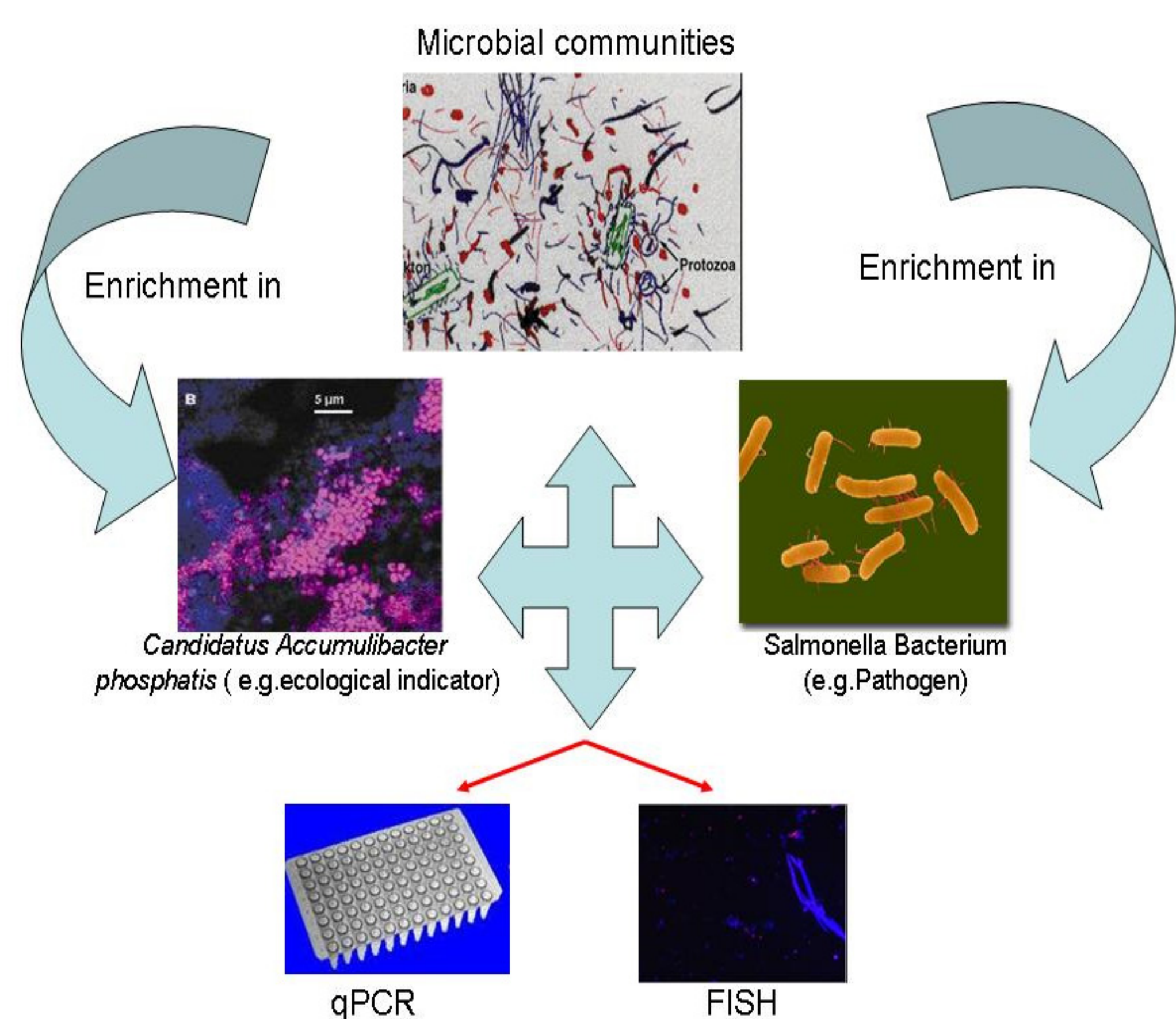
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MicroCoKit is a Marie Curie Industry-Academia Partnerships and Pathways (MC-IAPP) project entitled “Microbial Community based sequencing analysis linked to anthropogenic pressures: MicroCoKit to address the water quality” It is a close cooperation between academic groups with pan-European academic laboratories and leading private enterprises coordinated by CNR-IRSA.

MicroCoKit aims to i) investigate and identify aquatic complex stressor indicators based on microbial communities and ii) foster the transfer of knowledge among the partners with the final goal to bring to market faster, more sensitive and robust tools as bioindicators of water quality.

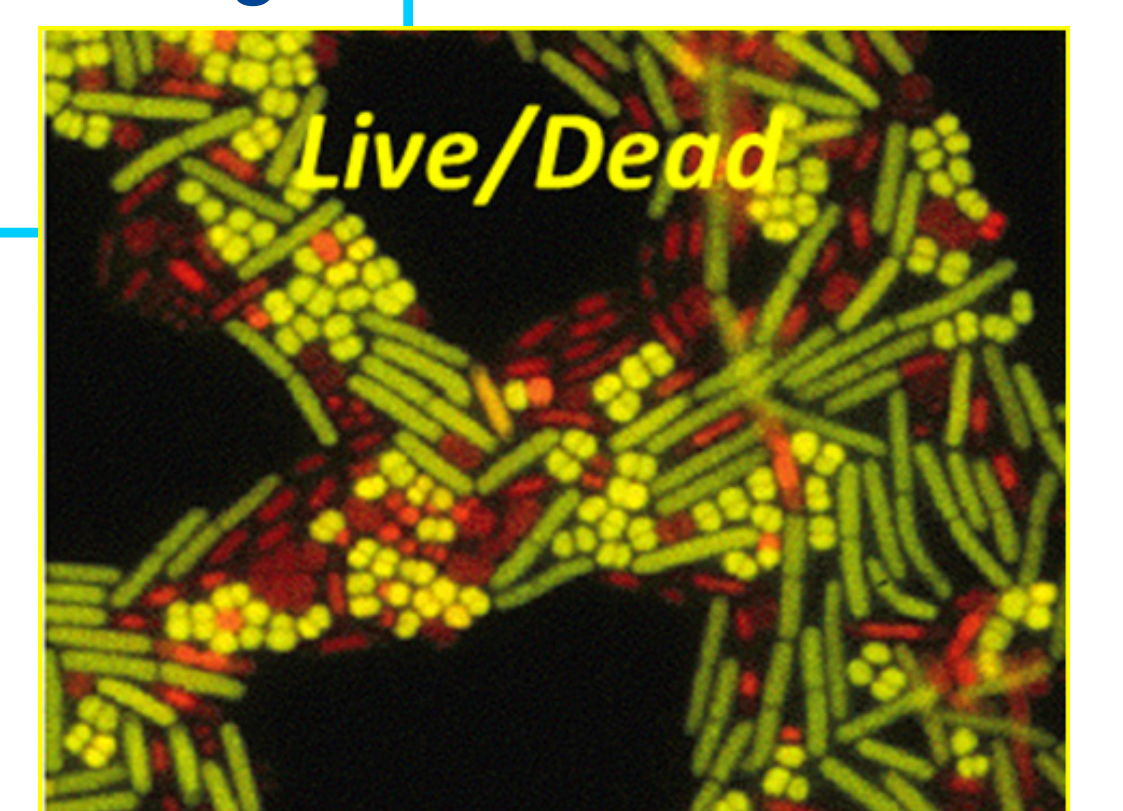
The river Tiber has been chosen as a pilot case study and four areas, including Emilia Romagna, Umbria and Lazio region, have been selected on the basis of various kinds of anthropogenic pressures such as pristine area, agricultural, industrial and urban areas.



The figure shows the final goal of MicroCoKit project which will be to generate kits for the water quality assessment, one based on quantitative real time (qPCR) and the other on Fluorescence in situ Hybridization (FISH).

Two water sample collection per year in two years for:

- Measurement of main physico-chemical parameters
- Sample collection for inorganic elements, DOC, Organic contaminants
- Water collection for community analysis by FISH
- Water filtration for community analysis (DNA/RNA extraction for 16 rDNA sequencing and shotgun)



## CHEMICAL ANALYSIS

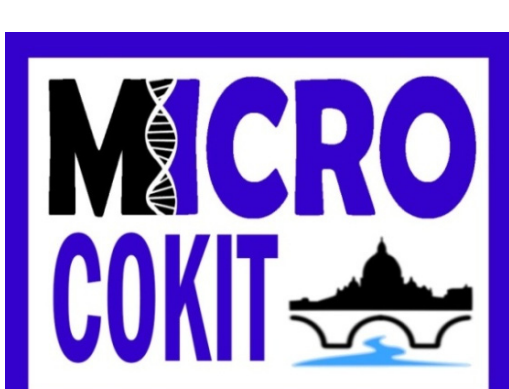
- **Inorganic elements:** NO<sub>2</sub>, NO<sub>3</sub>, Cl, SO<sub>4</sub>, F, Ca, Mg, Na, K, B, Ba, Sb, As, Cd, Cr, Cu, Pb, Hg, Ni, Se, V, Fe, Zn, Mn, Al, Sr, Li, Cs, U, Co
- **Dissolved Organic Carbon**
- **Organic Contaminants:**
  - Polycyclic Aromatic Hydrocarbon (PAHs)
  - Organochlorine, Triazine, Chloroacetamide pesticide, etc.
  - Emerging contaminants: Carbamazepine, Diclofenac, Sulfamethoxazole, Oxazepam, Perfluorinated compounds (PFOA, PFOS, PFBS, PFHxA, PFHpA, PFNA), Psychiatric drugs, etc.

## MICROBIAL COMMUNITY ANALYSIS

- **Metagenomics:** microbial community sequencing
- **DNA/RNA microarray test:** validation and identification of freshwater pathogens and indicators
- **Quantitative Real Time PCR (qPCR)** and primer design to generate a ready-to use plate
- Epifluorescence Microscopy**
  - **Total Microbial Abundance:** DAPI Counts
  - **Cell Viability:** Live/dead

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Project financed by European Union through FP7 (PEOPLE) Industry - Academia Partnerships & Pathways - Marie Curie Actions. (FP7-PEOPLE-2012-IAPP)

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