# High resolution and automated flow cytometry data management

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For the first time in the North Western Maditerranean sea, an automated flow cytometer (CytoSense), was coupled to a $pCO_2$ and pH sensor mounted after a FerryBox system on board of an opportunity vessel The C/F CARTHAGE of the Compagnie Tunisienne de Navigation (CTN). This vessel crosses the Mediterranean sea four times a week between Tunis (Tunisia) and Marseilles (France) and between Tunis and Genoa (Italy).

This installation was possible thanks to the collaboration between the Tunisian National Institute of Marine science and Technologies (INSTM) and the Mediterranean Institute of Oceanography (MIO) within the frame of the Continuous High Resolution Observation of the MEditerranean sea project. A*MIDEX CHROME aims to study the physicochemical and biogeochemical context of surface waters, integrating high-resolution space and time scales (mesoscale and weekly).

To achieve this goal, datasets needed to be managed and well presented for a better use by scientists. FerryBox datasets of temperature, salinity, pH, chlorophyll-a, fluorescence and dissolved oxygen are managed by the INSTM. While CytoSense dataset, managed by the MIO, is composed of pictures taken by an image in flow device for the recognition of cells up to 20 µm (part of the microplankton group) and several parameters linked to functional groups (pico-nano-microplankton, cryptophytes, cyanobacteria) based on cells pulse shapes and specific optical properties.

For one project, data files acquired from the instrument are batch processed, converted and validated though CytoBase Input Processor, which is a standalone software built on R programm by Mathilde Dugenne. Then, outputs are composed of : one data file (for all measurements) and Picture table able to couple between analysis and the taken picture. Data integration into MySQL database is processed automaticlly using Extract Transform and Load tool (ETL). Finally, data retrieval are displayed through dynamic charts on a web-based interface called "CYTOBASE" [https://en-chrome.mio.univ-amu.fr/?page_id=938]. Results of this work provided to CHROME project scientists' an easy tool for data storage, smart query and decision support that would be deployed in the marine field.

However, CYTOBASE is not interoperable yet with International infrastructure like "SeaDataNet". In fact, several pan European infrastructure manage physico-chemical databases (Coriolis, SeaDataNet), but flow cytometry data don't benefit yet from a proper management and quality control according to international standards among UE projects.

This work presents the first data management methodology and the dedicated tools for this kind of dataset with a possibility to link with international infrastructure once a new flow cytometry vocabulary will be defined.