**3. OBJETIVES, METHODOLOGY AND WORK PLAN**

**3.1 General and specific objectives**

The main objective CHEMBIOPOL is to develop and apply advanced analytical and chemometric techniques for the analysis of mixtures of environmental pollutants and their TPs in water and biota, as well as for the evaluation of their effects and risks through the characterization of the metabolome of birds and fish. To achieve this overarching goal, the proposal outlines the following specific objectives:

1. Design and implementation of new monitoring and biomonitoring strategies combining the use of ceramic passive samplers for the integrated analysis of water contaminants and the sampling of biota (fish, birds) to determine exposure to contaminants. Coordinated by IP1.

2. Develop and apply HRMS analytical methods with both GC and LC for the comprehensive analysis of pollutants and their TPs in environmental samples and the metabolome of biota. Coordinated by IP1 and IP2.

3. Implementation and uncertainty assessment of new chemometric tools for the analysis of complex large GC-and LC-HRMS data sets generated using different acquisition modes (e.g. all ion fragmentation) and for the analysis of main water contaminants and source apportionment of environmental monitoring big data sets. Coordinated by IP2.

4. Develop new environmental risk assessment procedures integrating exposure, molecular (metabolomics) and apical adverse effects of chemical pollutants in birds and fish from real field populations. Coordinated jointly by IP1 and IP2.

5. Disseminate the results of the project and supervise the work of the researchers contributing to the project (including PhD students). Coordinated jointly by IP1 and IP2.

Overall, this proposal aims to generate new analytical tools and data analysis methodologies to better understand the presence, transformation, and impact of environmental pollutants on biota and provide new approaches for their environmental risk assessment.