

## Propuesta TFM



### El Máster Universitario en: Estudios Avanzados en Botánica

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Título	Multi-omics to explore chemodiversity
Resumen	<p>The vast array of chemical compounds produced by plants and fungi, is a key factor shaping ecological interactions, evolutionary adaptations, and potential applications in biotechnology and medicine. However, traditional single-omics approaches (such as genomics or metabolomics alone) provide only a partial view of the molecular complexity underlying chemodiversity. Integrating multiple omics layers, such as genomics, transcriptomics, and metabolomics, offers a holistic perspective, enabling the discovery of biosynthetic pathways, regulatory mechanisms, and molecule–gene associations driving chemical diversity across species and environments.</p> <p><b>Objectives</b></p> <ol style="list-style-type: none"><li>1. Integrate multi-omics datasets (genomic, transcriptomic, and metabolomic) to build comprehensive models linking gene to a molecule.</li><li>2. Identify key biosynthetic pathways and regulatory networks responsible for the production and diversification of specialized secondary metabolites.</li><li>3. Characterize environmental and evolutionary influences that shape chemodiversity across species or ecological niches.</li><li>4. Develop computational frameworks and analytical tools for cross-omics data integration and interpretation.</li><li>5. Apply multi-omics insights to discover novel bioactive compounds and inform biotechnological or pharmaceutical innovation.</li></ol> <p><b>Competence</b></p> <p>Pharmaceutical and Natural Products Industry. Agriculture and Food Science. Biotechnology, Data solutions and Bioinformatics services.</p>