

Tecnologie Convergenti per i Sistemi Biomolecolari (TeCSBi)
Converging Technologies for Biomolecular Systems (TeCSBi)

Progetto di ricerca Research project	<p><i>“Biologia sintetica applicata al biomanufacturing di prodotti naturali di pianta di interesse farmaceutico”</i></p> <p><i>“Synthetic biology applied to the biomanufacturing of plant natural products of pharmaceutical interest”</i></p>
Tipo/Type	<p>Borsa cofinanziata da Indena S.p.A. (D.M. n. 630/2024) Scholarship co-funded by Indena S.p.A. (D.M. n. 630/2024)</p>
Borse/Scholarships	1
Abstract	<p>Plant secondary metabolism generates a vast array of structurally unique and functionally diverse bioactive compounds known as plant natural products (PNPs). These compounds play crucial roles in plant development, communication, and defense. Additionally, many PNPs have therapeutic properties and are used as antibiotics, analgesics, antivirals, neurocognitive therapies, and chemotherapeutics. Due to their complex stereochemistry, the production of many PNPs currently involves laborious extraction procedures from commercially grown plants, followed by tailored semisynthetic modifications.</p> <p>Recent advancements in metabolic engineering and synthetic biology have enabled the production of many natural products through the heterologous expression of complex enzymatic pathways in microbial hosts and the yeast <i>Saccharomyces cerevisiae</i> is often the platform of choice, especially for complex molecules. However, the process to introduce heterologous genes and rewiring endogenous metabolism is still not standardized enough, and this negatively affects the readiness-to-market of such metabolites.</p> <p>In this frame, this PhD project aims to establish and develop yeast-based cell factories for producing plant natural products of pharmaceutical interest. To achieve this goal, cutting-edge technologies will be implemented, including synthetic biology and CRISPR-Cas9 genome editing methodologies, metabolic products analyses and mass spectrometry.</p>
Tutor	Da definire/ To be defined
Mesi previsti in azienda/ Expected months at the company	12
Mesi previsti all'estero/Expected months abroad	6
Specific IPR rules: Intellectual property clauses agreed with the Company apply to this scholarship	