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Exploiting microbial sources to deliver novel bioactive natural products

Microbial Natural Products (NPs) have been one of the most prolific sources of new leads for the discovery of novel drugs to respond to unmet needs in infectious diseases, cancer and other therapeutical areas, with a large number of molecules and analogs still today in clinical practice. NPs present a unique chemical space and architectural complexity and their potency and selectivity is the result of an extended evolutionary selection to create biologically active molecules with the required properties to interact and potentially inhibit bacterial targets. NPs continue to play a key role in the discovery of new molecules to fill the chemotherapeutic arsenal and in the last years much attention has been given to marine sources and other less explored ecological niches such as lichens and plant associations which have proven to be an untapped rich source of new microbial diversity and novel NPs. Microbial genome mining and cutting edge analytical tools have become essential tools in any modern NPs drug discovery paradigm. These new platforms are allowing focus on NPs research on highly qualified microbial isolates, to assess their biosynthetic potential and address the discovery of new secondary metabolites using both culture-based approaches as well as heterologous-based expression systems to unlock new cryptic biosynthetic pathways. MEDINA is a research center focused on the discovery of novel bioactive NPs with one of the richest and most diverse NPs collections that are at the origin of our collaborative drug discovery research programs. To enrich our NPs libraries, new and diverse strains from untapped environments are continuously added to the existing microbial collection after culture-based approaches developed to succeed in maximizing the chemical diversity of our libraries. Our research in microbial natural products is focused on the identification of novel compounds with biological activity as potential new leads to respond to unmet needs in infectious and neglected parasitic diseases, cancer and neurodegeneration. As a result of these screening programs integrating the different approaches to support the discovery and development of novel NPs as potential new leads for drug development, we have identified different novel families of molecules with interesting new chemistry and biological activities that will be discussed in the context of current discovery efforts.

Biography

Olga Genilloud is a Scientific Director at Fundacion MEDINA, Spain and has research experience in bioactive natural products.

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