

NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY IN BIODIVERSITY AND NATURAL PRODUCTS – INCTBIONAT

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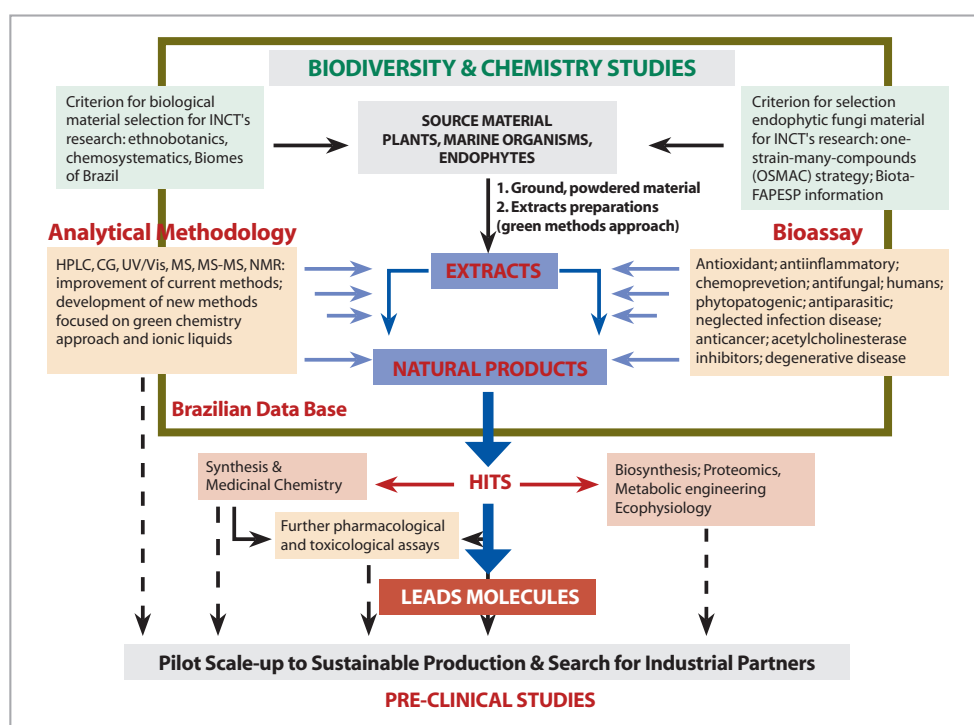


Figure 1. Experimental design of INCTBioNat

The INCT-BioNat is dedicated to the search of bioactive natural products from the fantastic chemical diversity synthesized by Brazilian biological resources. These compounds are important, as they communicate with their ecosystems, the physical environment and the living community, thus resulting in indispensable for the survival of the species in land and sea. Also, secondary metabolites are important supplies for the production of drugs, foods, cosmetics, fragrances, colorants, and agrochemicals, which support the vigorous bioeconomy in developed countries. The success of this initiative depends on most comprehensive collections of materials from different biomes, on the amount of identified natural products in plants, marine organisms and microorganisms, and on the optimization of bioassays and structural derivatization of the prototype compounds.

Taking into account the results we have achieved over nearly 15 years of research on biodiversity supported by BIOTA-FAPESP and CEPID-FAPESP CIBFar, our perspective in this national project is to optimize the searching methods to maximize the natural products-based leads. It is expected the compilation of a huge number of bioactive compounds with new structures for following pharmacological and toxicological assays, and further medicinal chemistry optimization. The state-of-art on natural products chemistry associated with modern analytical methodologies (HPLC-LC / MS, GC / MS, LC / NMR) and chemometric strategies are used by the research groups to map extracts and secondary metabolites from complex mixtures. Furthermore, metabolomic and dereplication tools will be applied for extracts, fractions and pure compounds screening in preliminary and intermediaries' bioassays.

The first database of natural products in Brazil was created on Nuclei of Bioassays, Ecophysiology and Biosynthesis of Natural Products Database (NuBBEDB webpage <http://nubbe.iq.unesp.br/portal/nubbedb.html>) with detailed information on all compounds already isolated by members of the NUBBE, IQAr-UNESP (For more information see Pilon et al., 2017. NuBBEDB: An updated database to uncover chemical and biological information from Brazilian biodiversity, Scientific Reports 7, 7215). The expansion this database is also a goal of this Institute. The organized information on biological, chemical and pharmacological data are vital for the complete understanding of our biodiversity, and so far, to contribute to public policies and to attract the interest of industrial partners.

This collaborative research institute embraces a team of national and international investigators aimed at to the development of scientific and technological research within the principles set out in public notice INCTs CNPq/FAPESP, and BIOTA-FAPESP, as an audacious national program. Facing this challenge and goal to expand the integration of national staff working on natural products chemistry, the INCT BioNat was designed to identify value-added bioproducts and to promote the dissemination of generated knowledge for the high schools and the public.

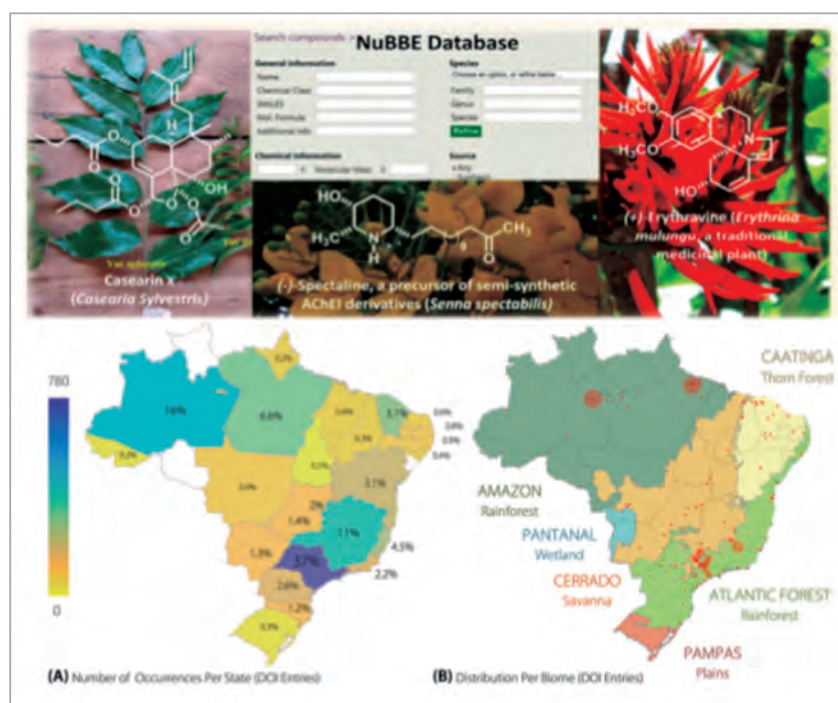


Figure 2. Representation of NuBBEDB and the distribution of compounds in Brazilian territory and its biomes (Pilon et al., 2017)

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