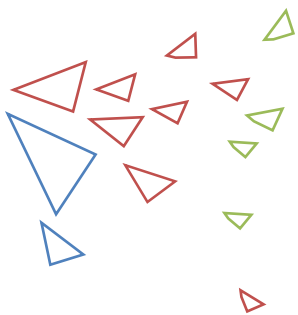


“Biodiversity – Access Platforms” as an innovative approach to accelerate bioprospecting in Latin America

Cristian Desmarchelier, D.Sc.



Bioprospecting



A branch of the bioeconomy focused on the exploration of natural sources for small molecules, macromolecules, biochemical and genetic information that could be developed into commercially valuable products for the agricultural, food, cosmetics and pharmaceutical industries.

Context



Biotech
+
Synthetics



Regulatory framework



Infrastructure



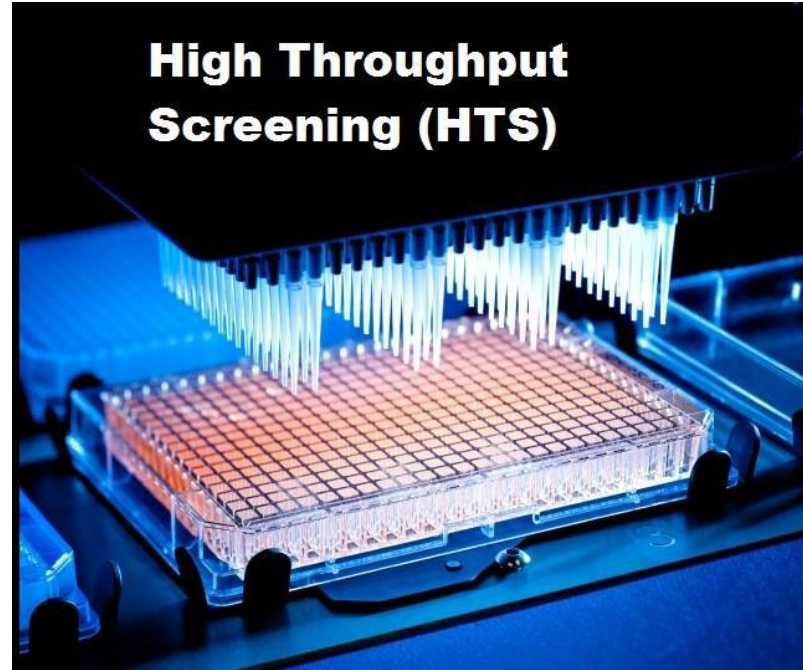
Atomization



Business model

Technology

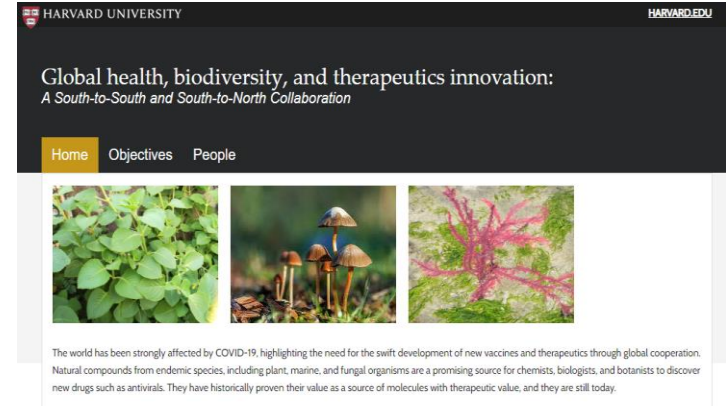
- Pharmacology
- Analytical Chemistry
- Bioinformatics
- Other technologies



Background

Pilot COVID 19:

- 200 samples analysed (plants, fungi, marine)
- 4 hits (2%, higher than 1 / 1000 - 10.000)
- Significant reduction in times
- Significant increase in # of samples (critical mass)

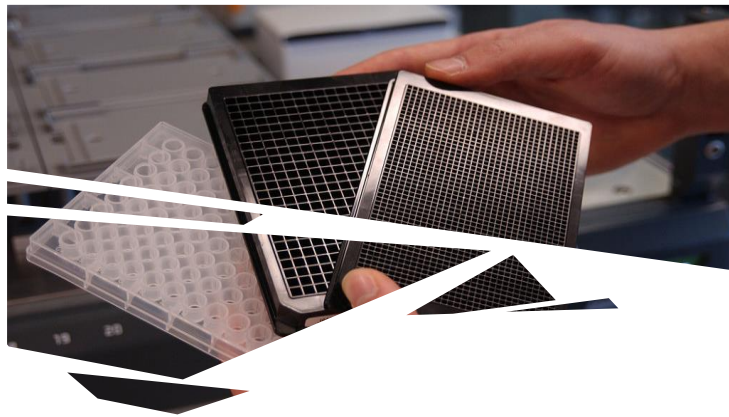


A solution?

Banks / Libraries of extracts

- Systematisation
- Critical mass
- Time
- Inclusion
- Traceability
- Risks

“Biodiversity – Access Platforms”



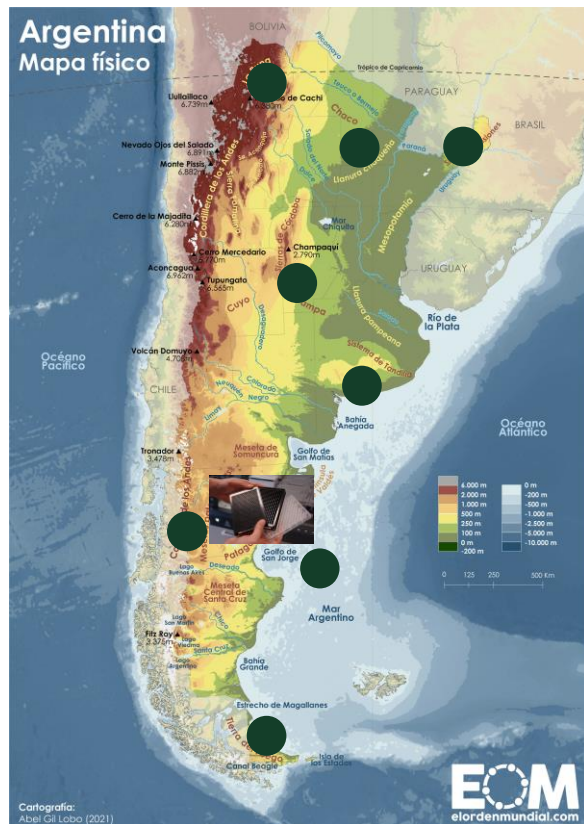
How it started

“National Bioprospecting Programme”

A joint venture between:

- University of Patagonia
- Chamber of Industry
- Ministry of Science & Technology





Objetives:

- 1) Create a **Bank / Library of Extracts** representing the main marine and terrestrial ecosystems for screening in HTS platforms in search for novel active ingredients.
- 2) Create a **Network of Nodes** representing the biodiversity of the country.
- 3) Create an **interactive database** for fast access to information leading to collaborative screening activities.

Initial budget:

Aprox USD 100K from the Federal Government (equipment and operating expenses). Counterpart: Chamber of Industry of Puerto Madryn and University of Patagonia.

Team:

Drs Tamara Rubilar, Marisa Avaro and Augusto Crespi (UNPSJB, CONICET)

National Bioprospecting Programme

Stages



Incubation (2023)

(1 year)

- Lab at Technology Park of Puerto Madryn (Patagonia)
- 1000 samples
- Ongoing HTS Platforms survey

Scale-up (2024 - 8)

(5 years)

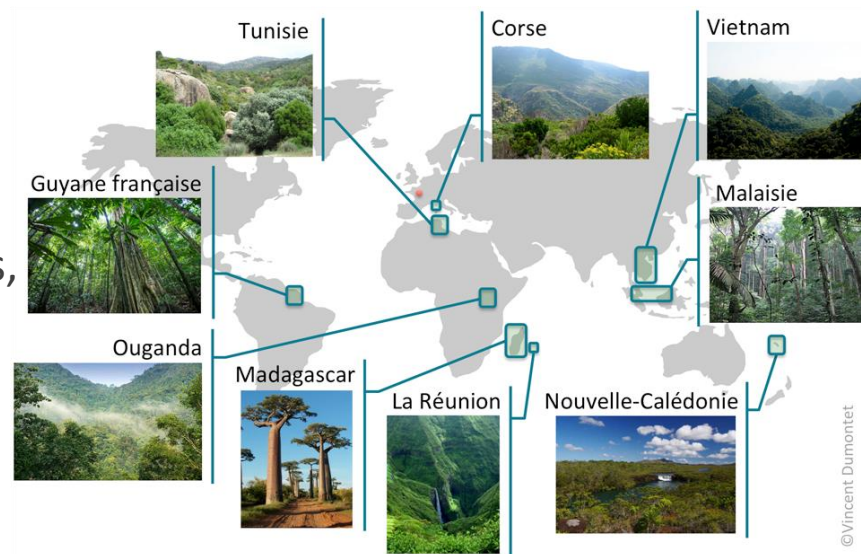
- Terrestrial ecosystems
- Systematized access

Are we alone?

“Extractothèque”



- Institut de Chimie de Produits Naturelles, Université Paris – Saclay
- 14K extracts from 6,5K superior plants
- Oncology platform



Are we alone?

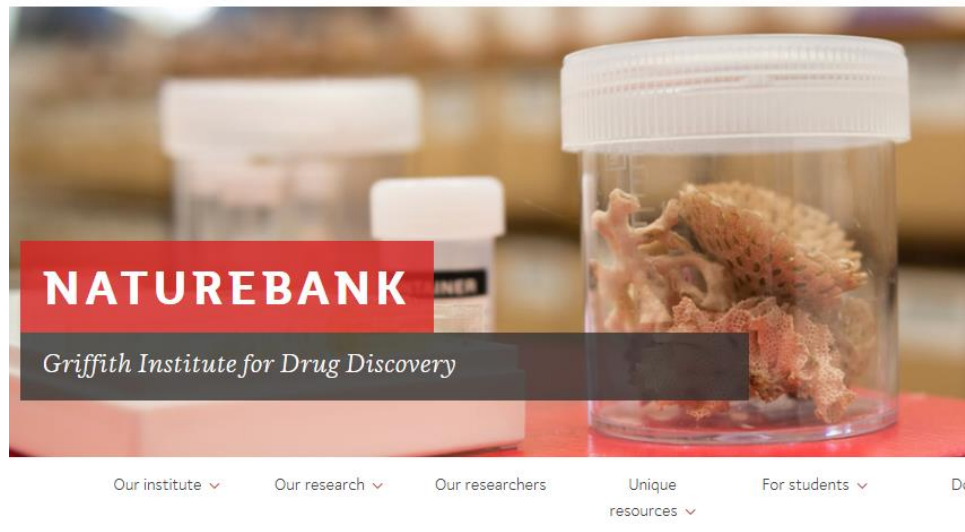
“NatureBank”



- Institute for Drug Discovery, Griffith University – Australia
- 20K extracts + 112K fractions



Home > Griffith Institute for Drug Discovery > Unique resources > NatureBank



Are we alone?

“LNBio”



- Centro Nacional Pesquisa em Energia e Materiais
- 6K extracts
- Platforms: oncology, cardiovascular, metabolic, infectious diseases

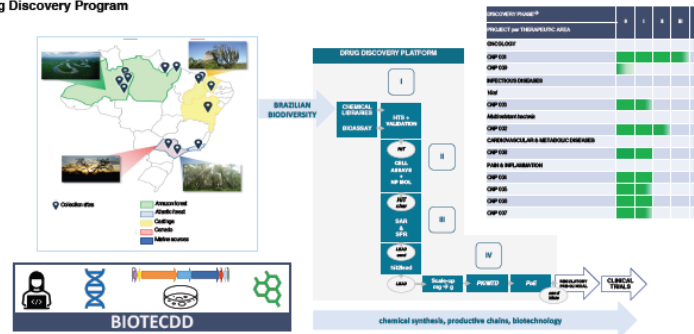


MINISTÉRIO DA
CIÊNCIA, TECNOLOGIA
E INOVAÇÕES



Natural product-based drug discovery at LNBio-CNPEM

Drug Discovery Program



HTS: high throughput screening; NP ISOL: natural product isolation; SAR: structure-activity relationship; SPR: structure-property relationship; hit2lead: structure-based drug design and chemical synthesis
PK: pharmacokinetics; MTD: maximum tolerated dose; PoE: proof-of-efficacy in animal models

How it's going

Feasibility analysis of introducing innovative models for bioprospecting in the Western Amazon Basin

Inter-American Development Bank



Cristian Desmarchelier

How it's going

Some facts:

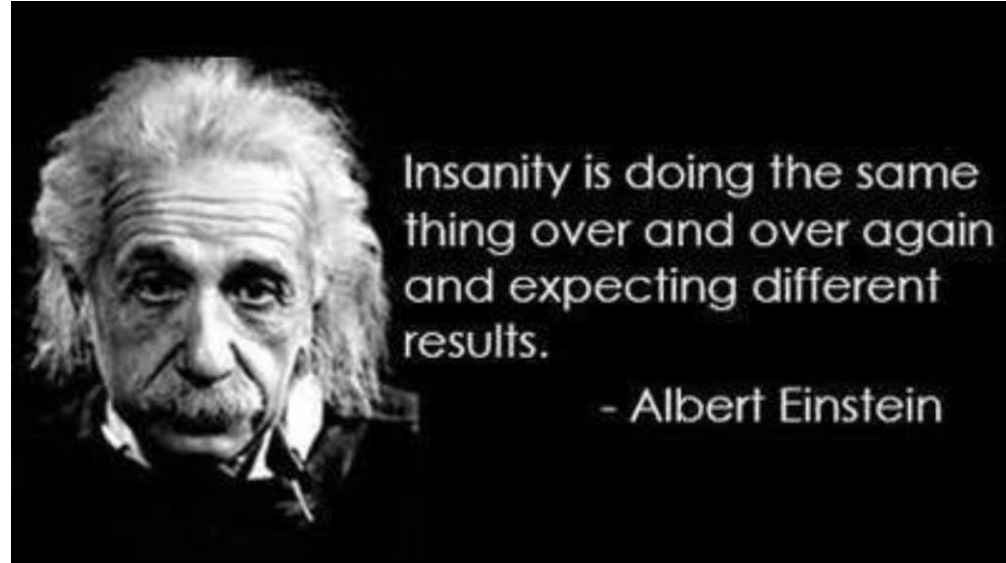
- The Western Amazon is the richest part of the basin.
- Unlike the Eastern (Brazilian) Amazon, a largely intact ecosystem.





So far...

- “Horizontal” approach re value chain
- “Open” approach re specimen selection (critical mass)
- Critical mass and traceability now central in the new model
- Five experiments in five countries
- New approach to an old problem: access



Support & Funding



Ministerio de Ciencia,
Tecnología e Innovación
Argentina



IDB

Inter-American
Development Bank

