



**BIOEXPLORATION – NOVEL
METHODOLOGY FOR THE
IDENTIFICATION OF VALUABLE
NATURAL PRODUCTS DERIVED FROM
MEDITERRANEAN FLORA**

Bio-Xplore





Programme
funded by the
EUROPEAN UNION



ENPI
CBCMED
CROSS-BORDER COOPERATION
IN THE MEDITERRANEAN

FACTS ABOUT THE PROJECT

- Project Funded by the ENPI-CBCMED program
- The team:

PARTNERS

Hadassah Academic College Jerusalem

Biodiversity and Environmental Research Center

Leitat Technological Center

Hellenic Regional Development Center

Israel (Applicant)

Palestinian Authority

Spain

Greece

ASSOCIATE PARTNERS

Forest Technology Center of Catalonia

Rutgers University

North Carolina State University

Spain

USA

USA



BACKGROUND



○ GIBEX: Global Institute for Bioexploration

Global research and development network that promotes ethical, natural product-based pharmacological bioexploration to benefit human health and the environment in developing countries.



- Discovery
- Development
- Training
- Conservation

- Sustainability
- Partnership
- Exploration



A single green plant produces more compounds than all man-built chemical plants.

- Optimized for biological function
- Designed to work together

The proportion of NCE drugs developed each year based on natural products remained relatively constant over the last 25 years even while the interest in these sources decreased

Conclusion: Nature is still a useful source for drug discovery



THE OBJECTIVES

GIBEX's Foundation: 'REVERSING THE FLOW':

- Reversing the resource drain: GIBEX brings pharmacological screens to nature, not nature to screens
- Reversing the R&D drain: GIBEX builds R&D capabilities in the source countries. GIBEX approach can be adapted to both developing and developed countries



GIBEX BENEFITS

- As Educational Tool
- Connects biodiversity, conservation and human health
- Expanding knowledge base
- Building trust between local communities and scientists
- Hits are also valuable = cataloguing biodiversity



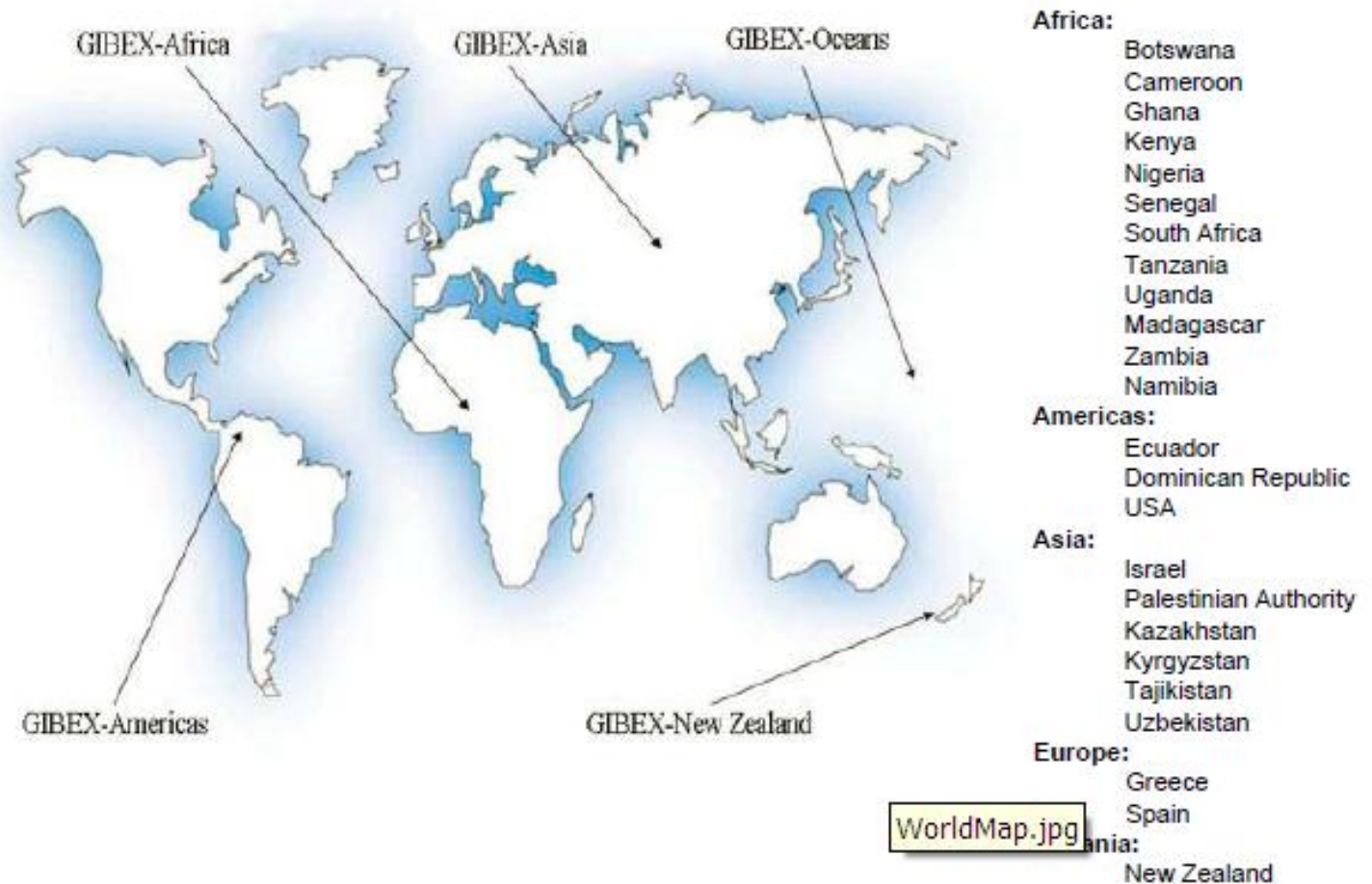


GIBEX: MARKET FOR THE PRODUCTS

	Category	Description	Example	Regulations
	Drug (NCE)	Single compounds intended to cure or prevent disease	Taxol, Aspirin, Artemisinin	IND/NDA FDA approval.
	Botanical Drugs	Extracts intended to cure or prevent disease	Veregen Many in clinical trials	IND/NDA FDA approval.
Multi-component Botanicals	Dietary supplements (Nutraceuticals)	Extracts intended to supplement diet. Possible health claims.	Garlic extract Echinacea Ginseng	Pre market FDA notification or history of use.
	GRAS ingredients (Food additives)	Extracts which affect food characteristics. Possible health claims.	Phytosterols Stevia	Pre 1958 common use. Pre market FDA approval. Self affirmation by experts.
	Medical foods	Food for specific dietary management of a disease under physician supervision.	Limbrel /Primus Inc.	Generally Recognized As Safe (GRAS) by US FDA.
	Functional Food	Food with health benefits beyond nutrition	Oatmeal Cranberry juice	None; safety established by manufacturer. FDA-approval for health claims.
	Cosmeceuticals	Extracts which supplement cosmetic products. No claims.	Aloe extracts	None; safety established by manufacturer.



GIBEX's Members





GIBEX MANUAL – AN EFFECTIVE TOOL FOR TECHNOLOGY TRANSFER

1. Glucosidase and glucosidase inhibitors
2. Amylases and amylase inhibitors
3. Proteases and protease inhibitors
4. Anti-bacterial (2 screens)
5. Anti-protozoan (3 screens)
6. Anti-fungal (2 screens)
7. Anti-nematodal
8. Anti-flat worms
9. Tyrosinase inhibitors
10. UV blockers
11. Total alkaloids
12. Total anthocyanins / polyphenols
13. Antioxidants
14. Brine shrimp lethality assay
15. Planaria regeneration assay
16. DNA repair assay

Currently Available 23 Screen To Nature (STN) Technologies

STN are :

-Fast screens

-Easy to do

-Can be brought to Nature

-Need low cost materials /equipment

Several diseases have been

targeted: Bacterial infections ; Protozoan infections; Fungal Infections; Helminthic infections; Diabetes and Metabolic disorders; Cancer; Inflammatory diseases; Autoimmune diseases; Age-related diseases ;Nutritional deficiencies



BIO-XPLORE IN THE GIBEX NETWORK

A great opportunity to work and explore together!

BioExplore will bring the Gibex technologies to developed areas for the first time





BIO-XPLORE MISSION

- Utilize financial and human resources to discover, develop and commercialize health and wellness products derived from Mediterranean plants
- Promote human health based on scientific knowledge
- Impact academic education
- Stimulate regional economic development & cooperation
- Create an active collaboration among partners





BIO-XPLORE VISION

- Contribute to the regional economic development and social well being
- Make BioXplore Partnership the conduit for bringing people together from different cultures, religions and regions
- Use science to communicate and create trust





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OUR MAIN OBJECTIVES

- Establish a strong and integrative working team based on mutual trust and complementary skills and resources
- Train people in all partners areas in the screening and discovery of plant derived bioactives
- Develop new screening assays according to the directions of the Global Institute of Bio Exploration (GIBEX)
- Identify plants with commercial potential
- Initiate negotiations with local industry for marketing of new products
- Become an active member of GIBEX organization in the Mediterranean Area





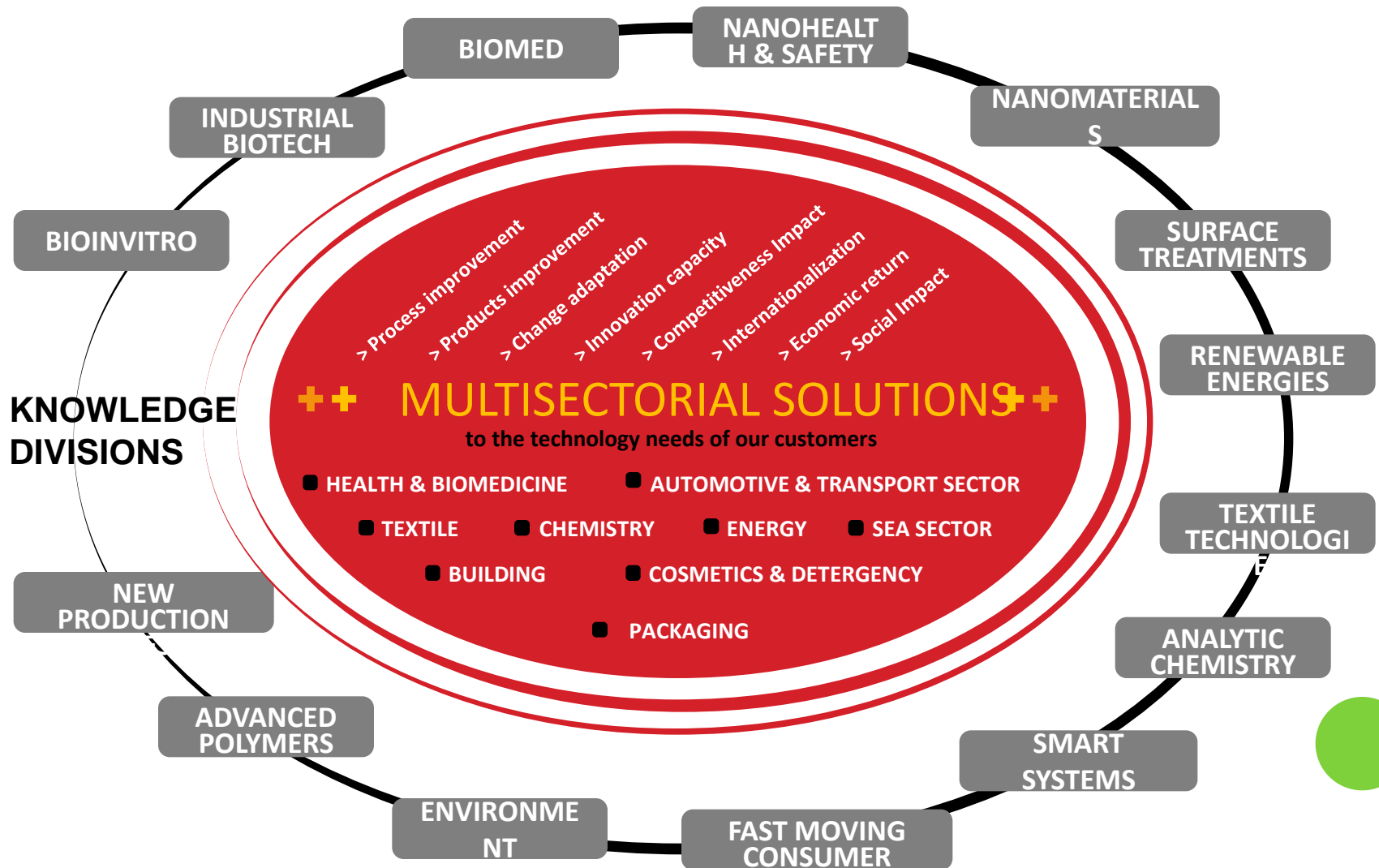
OUR DELIVERABLES

- Identification of plants with commercial potential
- Increased employment and business opportunity in the agriculture, food, cosmetics and biotech industry
- Cross Border interaction among partners
- Increased awareness of the local public population to the value of their natural flora
- Improved scientific and industrial knowledge of the institutions involved
- Integration with GIBEX activities
- Establish GIBEX- MED and BioXplore centers in all involved regions.



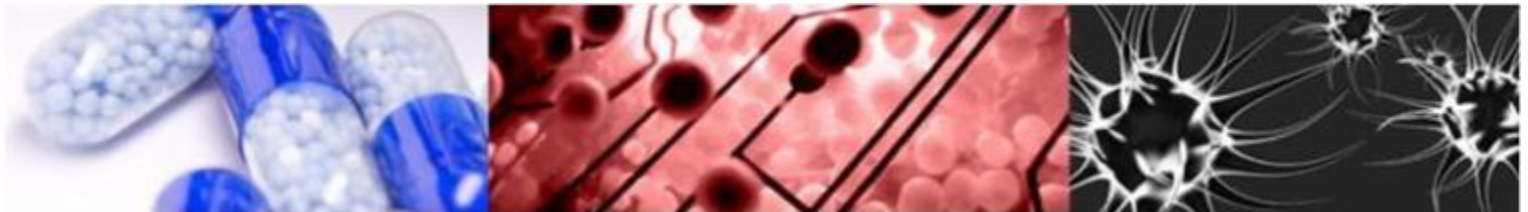
LEITAT IN BIO-XPLORE

Leitat is a private non-profit association with the aim to collaborate with companies adding value in R+D activities



INDUSTRIAL BIOTECHNOLOGY

- R+D aimed at biotechnological solutions with application in the industrial sector.
- R+D in Applied Microbiology: strain selection, antimicrobial/antifungal, process validation. Biofilms...
- Microencapsulation of active principles.





BIOINVITRO

- Cellular models for toxicity, efficacy, safety and mechanism studies.
- Customized research and scientific consulting to biotechnological , chemical, pharmaceutical and cosmetic industries.
- Development of ready-to-use cell-based kits for in vitro ADME/TOX studies.
- Screening assays.



BIOMEDICINE

- R&D of new drugs for cancer therapy.
- Screening of compounds (NCE, NBE) in a number of in vitro and in vivo models.
- Study and analysis of therapeutic efficacy in cellular and animal models.
- Identification of new therapeutic indications for known drugs (reprofiling).
- Generation of tailor-made monoclonal antibodies.
- Molecular Engineering of antibodies: humanization and biosimilars.
- Design of biosensors and diagnostic kits.



LEITAT – CONTRIBUTION TO BIO-XPLORE

- Creating the local Bio-Xplore Center for the consortium in Spain.



- Training some of its personnel in the technology.
- Performing screens together with locals
- Identifying potential candidates

- Contributing to expand the technology creating a new kit



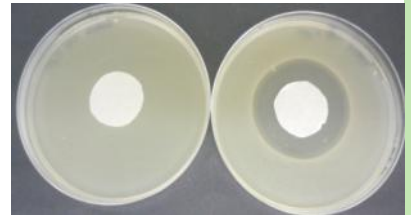
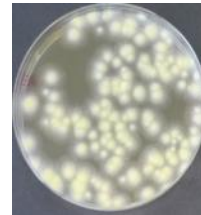
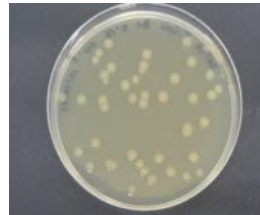
LEITAT – CONTRIBUTION TO BIO-XPLORE

- Contribute to further analysis of potentially valuable candidate plants that were screened for the following analysis applying its experience in the research field:

- Antibacterial assay



- Antifungal assay



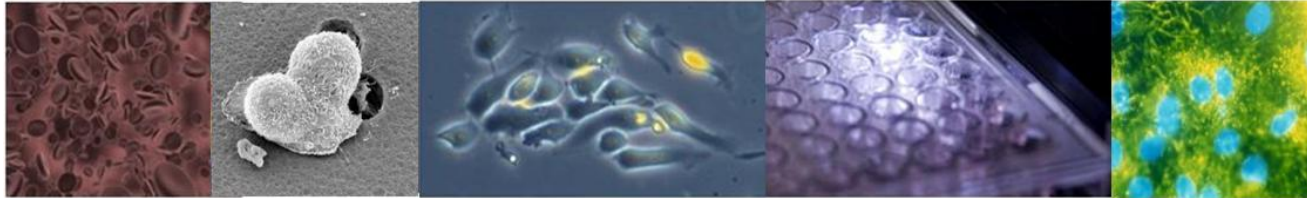
- Glucosidase inhibitor assays

- Protease inhibitor assays



LEITAT – CONTRIBUTION TO BIO-XPLORE

- Contribute to further analysis of potentially valuable candidate plants :



- In vitro testing: security (ADMETOX) and efficacy (anticelulitic, antioxidant , antiageing,)
- Microtoxicity
- Antitumor assays in cell and animal models
- New therapeutic activities for drugs // extracts



- Technology transfer





EXPECTATIONS FROM TODAY

- Identify stakeholders from plant producers to product developers that can be interested in following the project and participating in further developments
- A list will be circulated for interested people, scientists, companies, associations...





AKNOWLEDGEMENTS



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Dr. Gili Joseph





THANK YOU VERY MUCH FOR YOUR ATTENTION

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