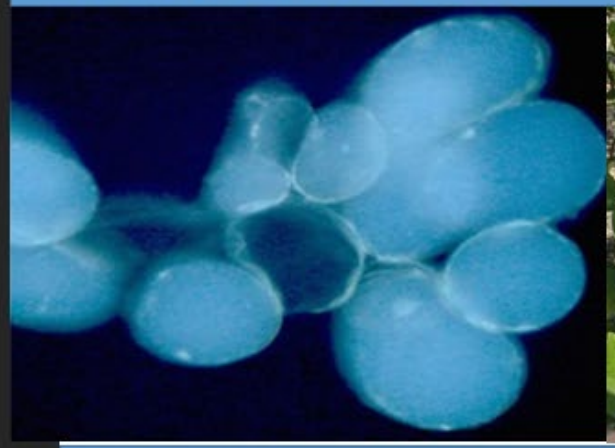
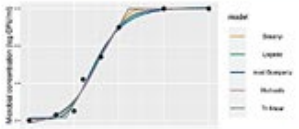
ANNUAL REPORT - 2023

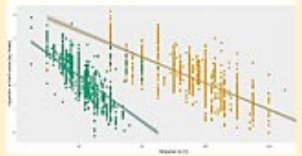


INSTITUTE OF PLANT BIOTECHNOLOGY

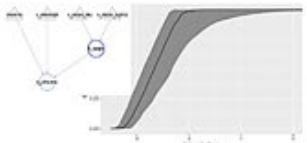
Predictive Microbiology
bioinactivation
biogrowth



Meta-regression
D database



QMRA - Monte Carlo
biorisk



Universidad Politécnica de Cartagena

MEMBER OF EUT+ EUROPEAN UNIVERSITY OF TECHNOLOGY

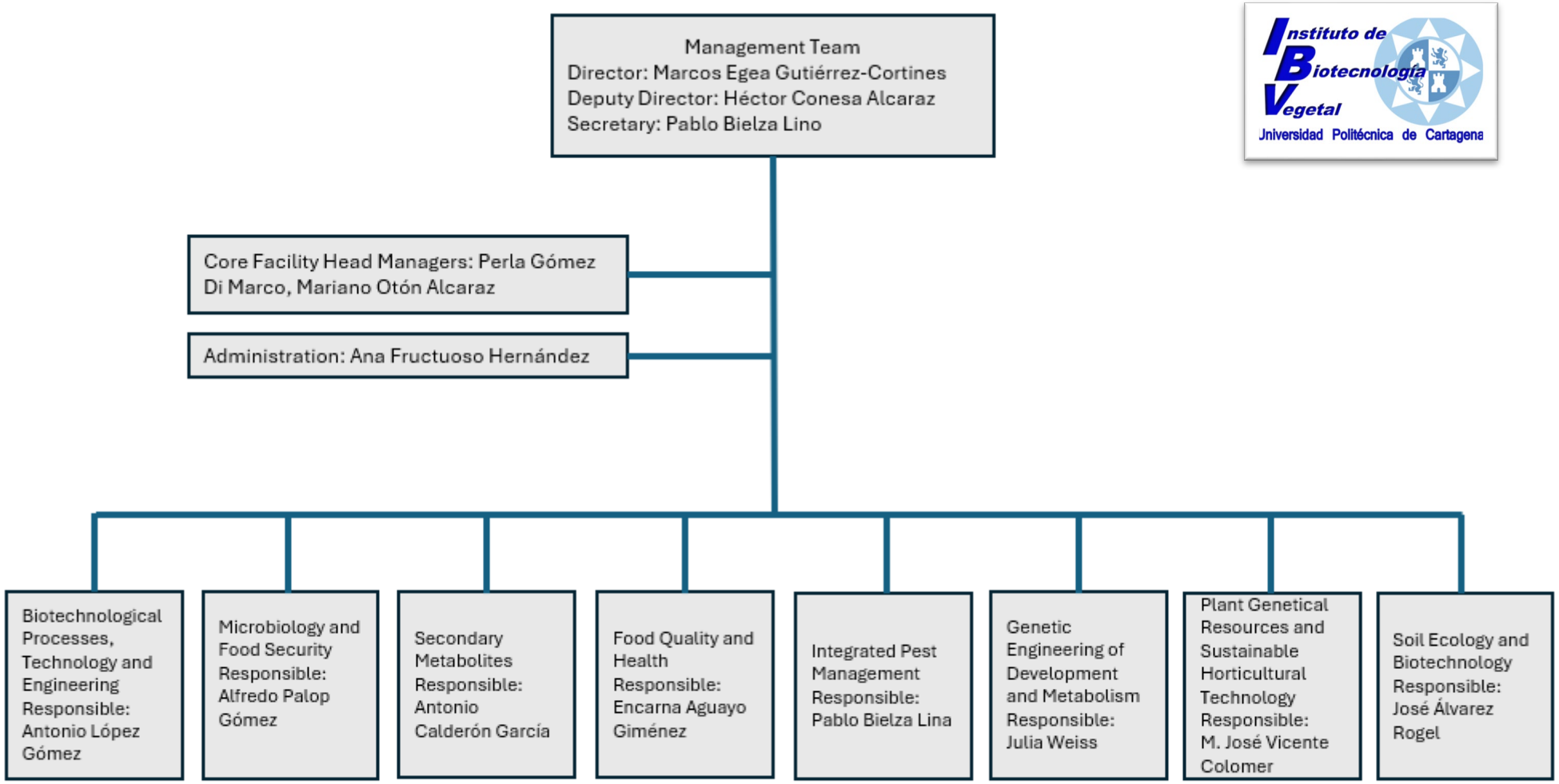
Human Resources Strategy for Researchers (HRS4R)

25 Aniversario UP CT 1998 - 2023

Instituto de Biotecnología Vegetal
Universidad Politécnica de Cartagena

INDEX

ORGANIZATIONAL CHART


Management Team
Director: Marcos Egea Gutiérrez-Cortines
Deputy Director: Héctor Conesa Alcaraz
Secretary: Pablo Bielza Lino
Core Facility Head Managers: Perla Gómez Di Marco, Mariano Otón Alcaraz
Administration: Ana Fructuoso Hernández
Biotechnological Processes, Technology and Engineering Responsible: Antonio López Gómez
Microbiology and Food Security Responsible: Alfredo Palop Gómez
Secondary Metabolites Responsible: Antonio Calderón García
Food Quality and Health Responsible: Encarna Aguayo Giménez
Integrated Pest Management Responsible: Pablo Bielza Lina
Genetic Engineering of Development and Metabolism Responsible: Julia Weiss
Plant Genetical Resources and Sustainable Horticultural Technology Responsible: M. José Vicente Colomer
Soil Ecology and Biotechnology Responsible: José Álvarez Rogel

HUMAN RESOURCES

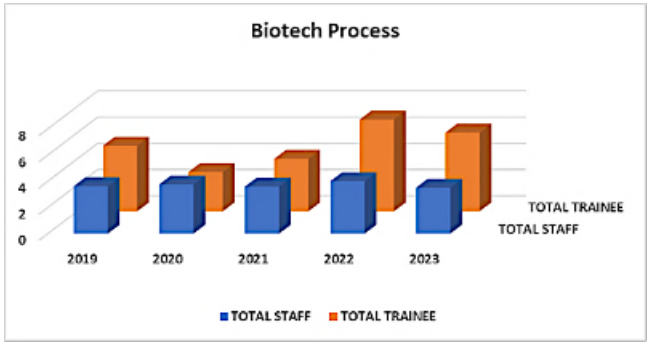
OVERVIEW HUMAN RESOURCES OF IBV - 2023

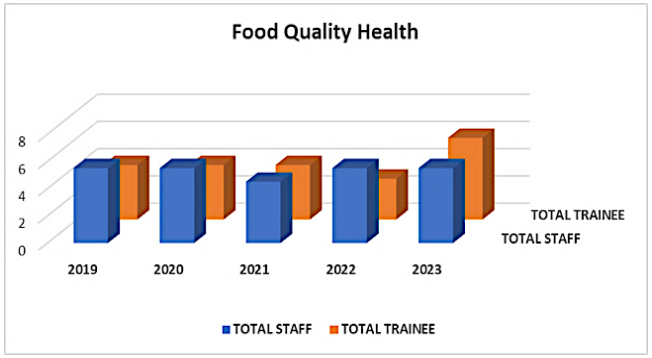
		Professional/Legal Status		Gender		Nationality				TOTAL	
		Civil Servant/Permanent position (FTE)	Non civil Servant/Non-permanent position (FTE)	M (FTE)	F (FTE)	ES (FTE)	EU (FTE)	Latin American (FTE)	Rest world (FTE)	TOTAL Full Time Equivalent (FTE)	Number of people
1	Group leaders	8	0	5	3	7	1	0	0	8	8
2	Senior Researchers	23	2.5	16	9.5	25.5	0	0	0	25.5	26
3	Postdoctoral researchers	0	13.25	3.5	9.75	10.25	1	2	0	13.25	15
4	Postdoctoral Trainees	0	7.5	3	4.5	6.5	0	0	1	7.5	8
5	Predoctoral Trainees	0	29.79	14.79	15	19.79	2	3	5	29.79	33
6	Technicians	0	10.53	3.9	6.63	10.53	0	0	0	10.53	13
7	Core Facility head-managers	2	0	1	1	2	0	0	0	2	2
8	Core facilities staff	0	0	0	0	0	0	0	0	0	0
9	Administrative staff	0.5	0	0	0.5	0	0	0	0	0.5	1
	TOTAL	33.5	63.57	47.19	49.88	81.57	4	5	6	97.07	106

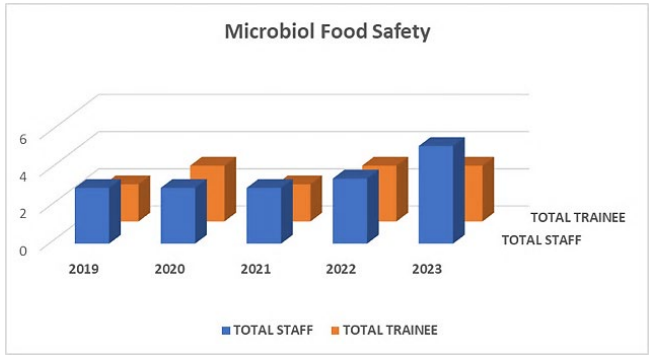
TECHNICAL STAFF OF IBV - 2023										
	Professional/Legal Status		Gender		Nationality				TOTAL	
	Civil Servant/Permanent position (FTE)	Non civil Servant/Non-permanent position (FTE)	M (FTE)	F (FTE)	ES (FTE)	EU FTE)	Latin American (FTE)	Rest world FTE	TOTAL Full Time Equivalent (FTE)	
Area A: Biotech Process	0	0	0	0	0	0	0	0	0	0
Area B: Food Quality	0	1	0	1	1	0	0	0	1	1
Area C: Soil Ecol and Biotech	0	5	2	3	5	0	0	0	5	5
Area D: Second Metabolites	0	0.83	0	0.83	0.83	0	0	0	0.83	1
Area E: Microbiol. Food Safety	0	0	0	0	0	0	0	0	0	0
Area F: Integrated Pest Managementy	0	1	1	0	1	0	0	0	1	1
Area G: Plant Gen Resorc. Sustainable Hort Technol.	0	1	0	1	1	0	0	0	1	1
Area H: Genetic. engineering of devolop. & metab.	0	1	0	1	1	0	0	0	1	1
Area: IBV CORE	2	0	1	1	2	0	0	0	2	2
TOTAL (FTE) (**)	2	9.83	4	7.83	11.83	0	0	0	11.83	12
TOTAL NUMBER OF TECHNICAL STAFF AT THE UNIT ON 31 DEC 2023 (persons)	**2**	**10**	**4**	**8**	**12**	**0**	**0**	**0**	**12**	

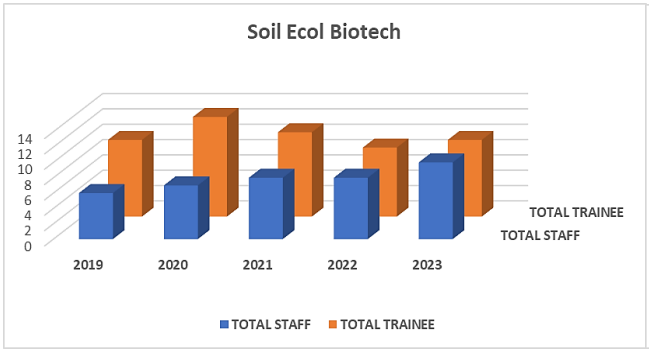
TOTAL PRE-DOCTORAL TRAINEES IBV - 2023								
All Areas	Undergoing Training							DOCTORAL THESIS DEFENDED (NUMBER) UNDER THE SUPERVISION OF THE UNIT' RESEARCHERS
	Gender		Nationality				TOTAL TRAINEES	
	M	F	ES	EU	Latin America	Rest world		
2019	10	25	23	5	4	4	35	1
2020	13	22	23	4	4	4	35	12
2021	15	16	21	4	3	3	31	9
2022	19	13	22	5	2	4	32	3
2023	16	17	22	3	3	5	33	3
Average 2019-2023	14.6	18.6	22.2	4.2	3.2	3.6	33.2	5.6
Total predoctoral on 31st December 2023	16	17	22	3	3	5	33	N.A.

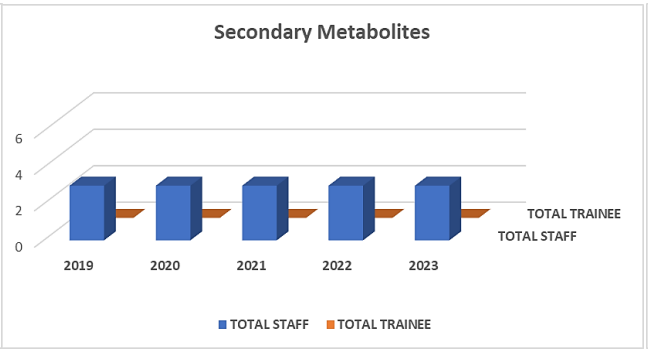
TOTAL STAFF AND PREDOCTORAL TRAINEES EVOLUTION 2019-2023

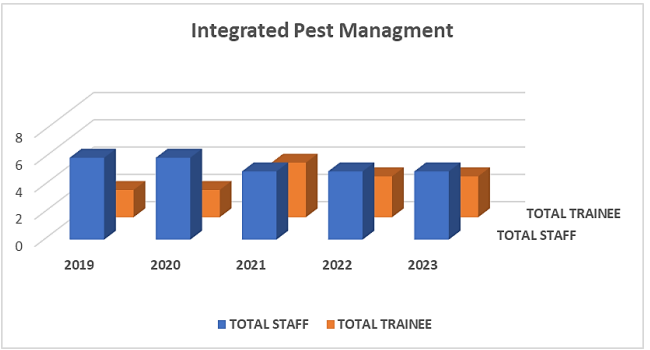


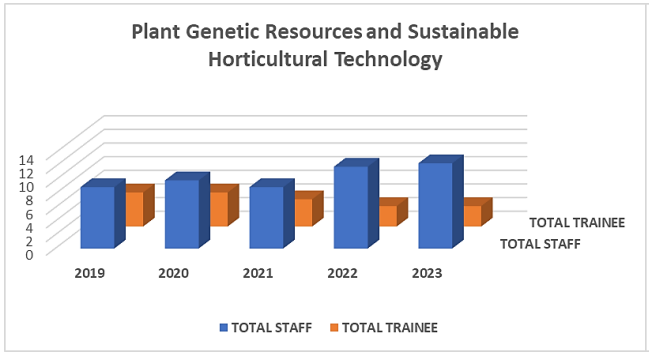


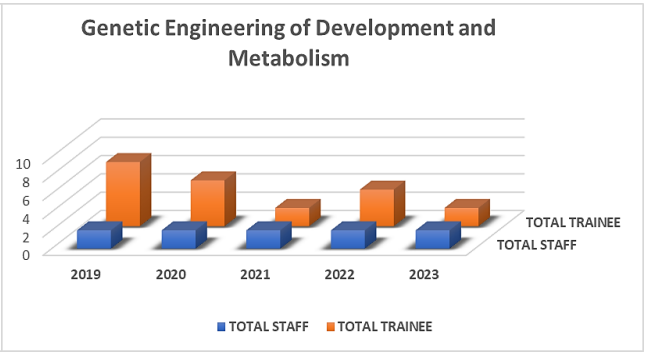












FUNDING 2019-2023

INCOME (Euro)	2020	2021	2022	2023	AVERAGE
PUBLIC FUNDING (TOTAL)					
COMPETITIVE SOURCES					
H2020- Horizon Europe	0	0	0	2,365,813	591,453
International sources (excluding H2020- Horizon Europe)	40,647	0	53,355	610,565	176,141
National		1,300,800	916,100	2,189,451	1,468,783
Regional (Comunidades Autónomas)	424,300	0	131,363	92,100	161,940
Others	0	0	0	0	0,00
NON-COMPETITIVE SOURCES					
International sources	0	0	0	0	0,00
National	0	0	0	0	0,00
Regional (Comunidades Autónomas)	2,700	8,235	262,558	295,935	142,357
Others	0	0	0	0	0
PRIVATE FUNDING (Total)					

COMPETITIVE SOURCES					
National	**0**	**0**	**0**	**0**	**0**
International	**0**	**0**	**0**	**0**	**0**
NON-COMPETITIVE SOURCES					
National	**810,335**	**1,510,289**	**325,147**	**1,067,953**	**928,430**
International	**1,300**	**10,588**	**2,653**	**2,824**	**4,341**
TOTAL FUNDING (Euro)	**1,277,982**	**2,819,324**	**1,688,523**	**6,621,816**	**3,101,911**

BENCHMARKING AND SWOT

BENCHMARKING OF IBV AGAINST ONE NATIONAL AND THREE INTERNATIONAL CENTRES

Areas	IBV	Universidad de Córdoba - Department of Agronomy, Spain (María de Maeztu Unit)	INRES (Institut für Nuztpflanzenwissenschaften und Ressourscenschutz). Univ. Bonn, Germany	Shannon Applied Biotechnology Centre, Ireland	Institute of Agricultural and Food Biotechnology – State Research Institute (IBPRS-PIB), Poland
1. Research Output Metrics					
Number of publications in peer-reviewed journals (2020-2023)	460 (9.38 publications/researcher)	417 (2.78 publications/researcher)	163 (0.81 publications/researcher)	45 (1.8 publications per researcher)	243 (5.40 publications/researcher)
Patents filed and granted	22	22	2	Unavailable	18
High impact publications	None	None	Over 20	1	None
2. Funding and Resource Allocation					
Total funding received (government grants, industry partnerships, philanthropic donations)	12.4 M € (253,061 €/researcher)	13.4 M € (89,333 €/researcher)	1 ERC Consolidator grant 8.1 M € BMBF for Greenhouse research 1.2 M € European projects. National unavailable	15 M € (600,000 €/researcher)	9 M € (192,000 €/researcher)
Private funding	3.4 M € (69,387€/researcher)	6.4 M € (42,666 €/researcher)	Unavailable	2.5 M € (100,000€/researcher)	Unavailable
3. Human Resources					
Number of researchers	49	150	200	25	47
Diversity and inclusion metrics	Yes	Yes	Unavailable	Unavailable	Yes
Training of PhDs	28 (0.57 per researcher)	30 (0.20 per researcher)	Unavailable	Unavailable	Unavailable
3. Infrastructure and Facilities					
Greenhouse facilities (size, capacity, climate control)	Yes	Yes	Yes	No	No
Computational resources (supercomputers, bioinformatics tools)	Yes	Yes	Yes	Unavailable	Unavailable
4. Collaborations and Partnerships					
Collaborative projects with international research institutions	9	9	3	Unavailable	4
Participation in consortia or networks	EUt+ Kew Gardens World Germplasm gathering	INVEST	Not relevant (Neurosciences)	Unavailable	European Culture Collections Organization
Joint publications or patents with collaborators	Yes	Yes	Unavailable	Unavailable	Yes
Exchange programs for researchers/students	Yes	Yes	Yes	Yes	Yes
5. Technology Transfer and Commercialization					
Spinoff companies founded based on research outcomes	Biodiverso BioiPack	Nirsoluciones Idolive	UrbanGreen GmbH Escarda Technologies GmbH	None	None

			Wegrow GmbH		
6. Quality Assurance and Compliance					
Adherence to ethical guidelines and biosafety regulations	**Confined use of transgenic material with positive evaluation from Ministry (A/ES/23/I-31)**	**Yes**	**Yes**	**Yes**	**Yes**
Documentation and reporting practices	**Open-source research and institutional repository https://repositorio.upct.es/**	**Open-source research and institutional repository https://helvia.uco.es/**	**Open access repository https://www.open-access.uni-bonn.de/de**	**Unavailable**	**Unavailable**

IBV - SWOT ANALYSIS

STRENGTHS

Social and competitive environment

- S1. University tradition in Cartagena in technical and business studies
- S2. Flexibility derived from the size and youth of the University
- S3. Local and regional prestige
- S4. Constant collaboration with private companies, public bodies, chambers of commerce, and professional and business associations
- S5. Transfer of undergraduate, MSc and PhDs to the private sector
- S6. Reproducibility of the research results, consistently demanded by the private sector for advancing technology
- S7. High quality of scientific research in the areas of agriculture, food and biotechnology
- S8. Capacity to obtain extramural funding at all levels
- S9. Admirable scientific-technological capacity of the Institute members and their engagement with the industrial agro-food industry that, under the option of the SAB, is probably one of the major strengths of the IBV (SAB)

Resources and capabilities

- S9. Modern and attractive facilities of the IBV
- S10. Quality research and teaching support infrastructures
- S11. Highly reputed scientists in very diverse disciplines and areas of expertise (SAB)
- S12. Experience in European quality recognition in official degrees with professional attributions
- S13. Development of the UPCT in the Technological Park headquarters

Research and manpower formation offer

- S14. Wide range of scholarships, contracts, and external internships for students
- S15. Satisfaction of both the university community and external stakeholders with the educational offering and the quality of graduates and PhD students
- S16. Capacity to attract foreign students
- S17. Educational offering of entrepreneurship skills through stable structures

WEAKNESSES

Scientific and competitive environment

- W1. Relatively low external recognition (national and international)
- W2. Lack of positioning in international university networks
- W3. Peripheral and relatively poorly connected geographical position
- ·W4. Low level of expenditure on R&D compared to the European average and to the more advanced regions in Spain.

Resources and capabilities

- W5. Resources are widely disseminated and do not concentrate the scientific efforts
- W6. Lack of dedicated technical assistance personnel
- W9. Limited attraction of research talent

OPPORTUNITIES

Social and competitive environment

- O1. Enhanced productivity resulting from integrating R&D into the business structure.
- ·O2. Alignment with regional, national, and European strategies in R&D&I
- O3. Integration of the Sustainable Development Goals (SDGs) in the university environment
- O4. Development of strategic alliances Campus Mare Nostrum and UP4
- O5. Participation in strategic alliances at the European level as EUT+
- O6. Establishment of new spinoff Knowledge-Based Companies

Resources and capabilities

- O7. Visibility of the high employability of STEM studies
- O8. Polytechnic character as a differentiating element
- O9. New financial framework for the period 2021-2025
- O10 Trend to an increase in financial autonomy via internationalization
- O11. Valorisation of public-private collaboration mechanisms with affiliated centres
- O12. Participation in competitive programs for attracting research talent linked to the renewal of teaching staff
- O13. National and international commitment to specialization and aggregation in knowledge and talent generation to eliminate inefficiencies

Research and manpower formation offer

- O14. IBV as flagship of the European Universities Alliance EUt+ (integrated by nine European Polytechnical Universities)
- O15. IBV staff heading the Joint Master in "Circular Food Systems and Innovation (EUROFOOD)", which will be initiated in 2025

THREATS

SOCIAL AND COMPETITIVE ENVIRONMENT

- T1. Regulatory complexity of the Spanish university system
- T2. Rigidity of the new public sector hiring system
- T3. Superior salaries in the private sector for engineers and technologists compared to public official research salaries and contracts

RESOURCES AND CAPABILITIES

- T5. Uncertainty in multi-year financing mechanisms due to economic context
- T6. Low number of grants and separation of research grants from personal grants and scholarships, unique to Spain
- T7. Tenure track positions linked to teaching load
- T8. Decrease in technical vocations in the Region and in Spain
- T9. Difficulties in retaining excellent human capital. "Brain drain" and difficulty in their return
- T10. Decreasing trend in the number of new students in Bachelor's and Doctoral degrees

RESEARCH UNITS

BIOTECHNOLOGICAL PROCESSES, TECHNOLOGY AND ENGINEERING

RESPONSIBLE: Antonio López Gómez.

STAFF

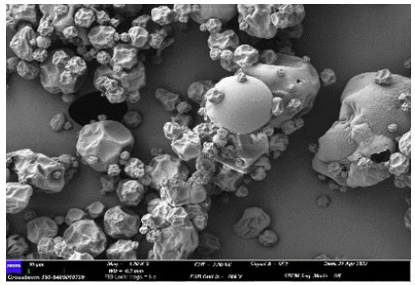
SENIOR and POSTDOC RESEARCHERS Asunción Iguaz Gainza, Ginés Benito Martínez Hernández, Amanda López Cánovas.

PREDOC: María Ángeles Martínez Sánchez, Alejandra Navarro Martínez, Elisa Orcajada Hermosilla, Miguel Tomás Gómez Hernández. Alfonso Sevillano Lozano, Miguel Victoria Sanes.

RESEARCH MAIN TOPICS

- • Biotechnological processes: processes aimed at obtaining various products through microorganisms or enzymes.
- • Products (which can in turn be microorganisms and enzymes): primarily intended for food, pharmaceutical products, and personal care products.
- • We are interested in the study/optimization of the technology of these processes (the conditions for their execution) and the engineering of these processes (the necessary equipment for their implementation) to maximize yields and minimize costs. We work at the laboratory scale, pilot plant scale, and at the industrial scale during the validation phase, optimizing the bioprocesses corresponding to each scale (technology and engineering).
- • As we study microbial development and enzymatic activity, we are also interested in the technology and engineering of reducing microbial and enzymatic activities in foods.
- Development of bioactive products and ingredients, and ultra-clean and aseptic packaging systems, as well as multi-active packaging systems (with antimicrobial and enzymatic inhibition activity).





FOOD QUALITY AND HEALTH

RESPONSIBLE: Encarna Aguayo Giménez.

STAFF

SENIOR and POSTDOC RESEARCHERS: Francisco Artés Calero, Francisco Artés Hernández, Juan Pablo Fernández Trujillo, Lorena Martínez Zamora, Marina Cano Lamadrid.

PREDOC: Laura Rasines, José Ángel Salas Millán, Nieves García Lorca, Seyedeh Zeinab Hashemi, Laleh Mozafari, Rosa Zapata Arráez.

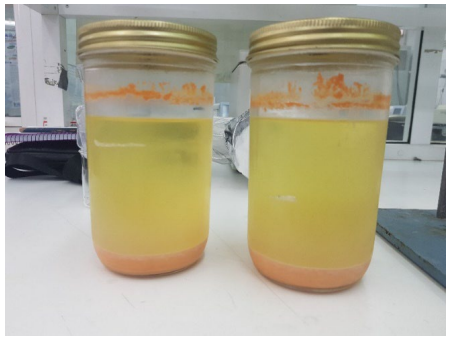
RESEARCH MAIN TOPICS

Innovation for Developing Healthier and Sustainable Food

- Sustainable food production, essential for reducing environmental degradation, food insecurities, improving the economy, and combatting the challenges of climate change.
- Development of new food products (with prebiotics/probiotic/bioactive ingredients) based on sustainability and innovation through by-product valorization, contributing to the reduction of food loss and waste.
- Improving post-harvest strategies, processing and packaging through the implementation of green and emerging food technologies.
- Identification of major QTLs by quality-oriented breeding strategies in melon fruit at harvest and during postharvest ripening to improve texture and storability.

Kombucha from strawberry by-products

Fermented drink from broccoli leaves



Wine from melon by-products

SOIL ECOLOGY AND BIOTECHNOLOGY

RESPONSIBLE: José Álvarez Rogel.

STAFF

SENIOR and POSTDOC RESEARCHERS: Raúl Zornoza Belmonte, Ángel Faz Cano, Héctor Miguel Conesa Alcaraz, María Nazaret González Alcaraz, Eva Lloret Sevilla.

POSTDOC TRAINEES: Melisa Gómez, Virginia Sánchez, Angélica Terrero, Alicia Morugán.

PREDOC: Matías Ceacero Moreno, Elena Samper Pérez, Irene Ollio, Cristina García Hernández, Ximena Katherine Capa, Juan Carlos Beltrá, José Gregorio Cuevas, Mohamed Mdaini, Onurcan Ozbolat, Mariano Marcos.

TECHNICIANS: Vanesa Izquierdo, José Antonio Martínez, Antonio Martínez, Miriam Valverde, Elena Heredia.

RESEARCH MAIN TOPICS

Agroenvironmental/agroecosystems

- Linking soil biodiversity and ecosystem functions and services for sustainable production.
- Identification of keystone soil organisms involved in key ecosystem services.
- Assessing soil health in terms of management in agricultural and forestry land uses.
- Agroecological alternatives to pesticides to enhance soil health and ecosystem services.

Environmental impacts of mining on ecosystems

- Phytomanagement of metal polluted soils.
- Biogeochemistry, functionality and ecotoxicity of metal polluted soils in a global warming perspective.
- Hydric systems and nature-based solutions to combat eutrophication and metal pollution.
- Forest management in a global warming perspective.




SECONDARY METABOLITES

RESPONSIBLE: Antonio A. Calderón

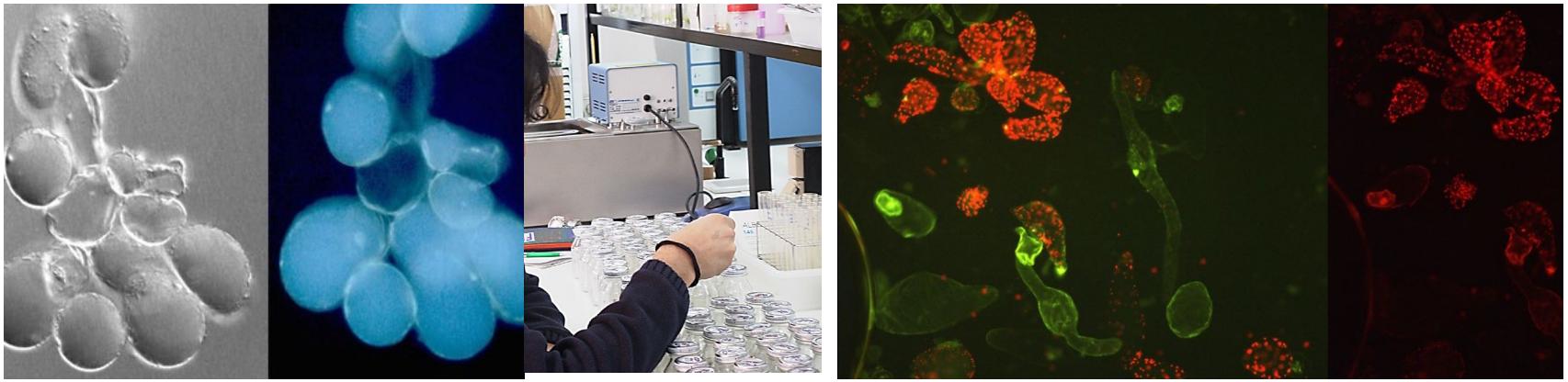
STAFF

SENIOR and POSTDOC RESEARCHERS: María Ángeles Ferrer, Matías López Serrano,

TECHNICIANS: Mirella López Ródenas

RESEARCH MAIN TOPICS

- Propagation of selected chemotypes of aromatic and medicinal plants (MAP).
- Development of methods for in situ extraction of metabolites.
- Development of MAP micropropagation methods using bioreactors.
- Use of microorganisms to enhance MAP growth and production in the field.
- Reuse of by-products from MAP extraction processes.
- Recovery of metabolites of commercial interest from hydrolates and residual biomass.
- Production of specialized metabolites of commercial interest from in vitro cultures of plant materials.
- Establishment of new cell and organ culture lines.
- Development of physical elicitation techniques.
- Induction of systemic plant resistance to biotic and abiotic stresses.
- Priming with chemical, physical and biological agents.
- Production of specialized metabolites in primed plants.



MICROBIOLOGY AND FOOD SAFETY

RESPONSIBLE: Alfredo Palop Gómez.

STAFF

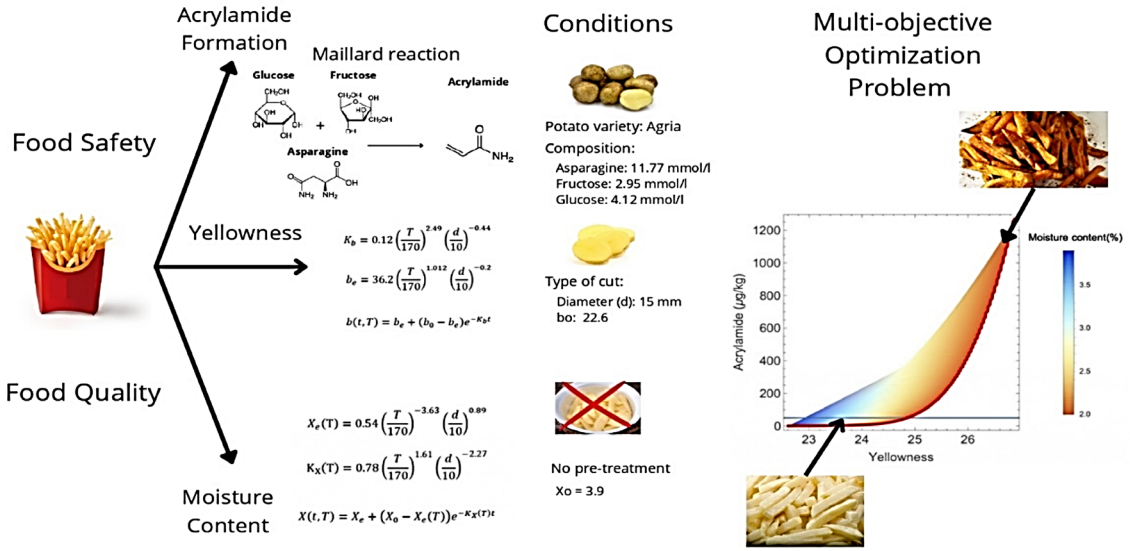
SENIOR and POSTDOC RESEARCHERS: Pablo Fernández Escámez, Paula Periago Bayonas, Arturo Esnoz Nicueza, Arantxa Aznar Samper, Alberto Garre Pérez, Enriqueta García Gutiérrez, Silvia Guillén Morer.

PREDOC: Leonidas Georgalis, José Lucas Peñalver, Antonio Luciano.

RESEARCH MAIN TOPICS

Extensive expertise in **food microbiological risk assessment**, mainly related to:

- Resistance and inactivation of foodborne pathogen and spoilage microorganisms exposed to food preservation treatments, such as heat or natural antimicrobials.
- Predictive food microbiology and quantitative microbiological risk assessment (QMRA).



Outline of a case study

INTEGRATED PEST MANAGEMENT

RESPONSIBLE: Pablo Bielza Lino.

STAF:

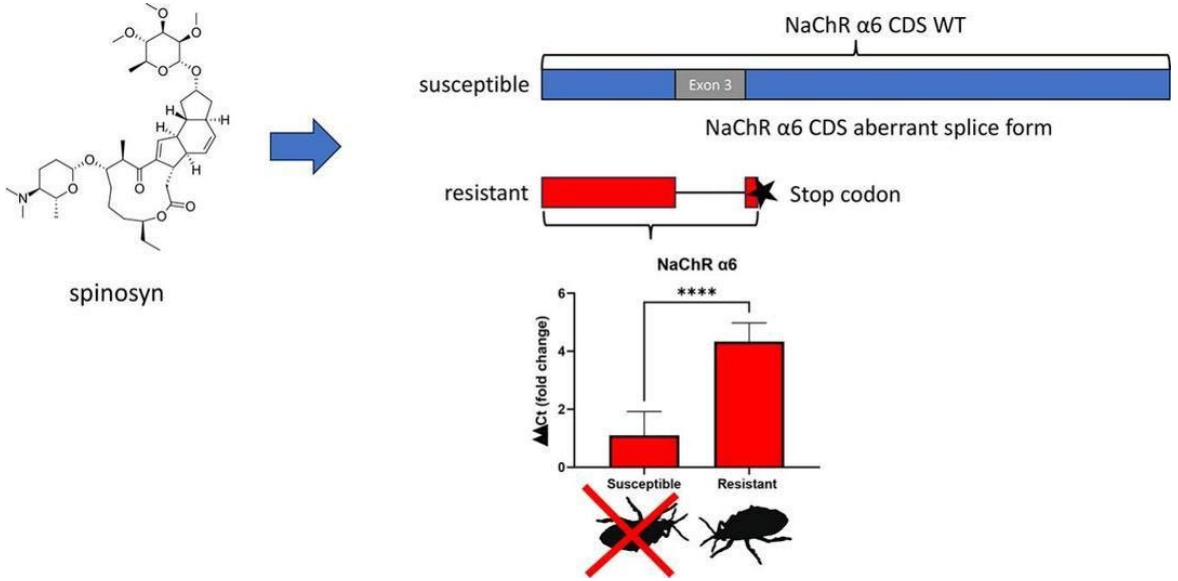
SENIOR and POSTDOC RESEARCHERS: Josefina Contreras, Dina Cifuentes, Juan Antonio Martínez-López, Carolina Grávalos Virginia Balanza.

PREDOC : María Carmen Reche, Ana Belén Abelaira, Amador Rodríguez-Gómez.

TECHNICIANS: Sebastián Bañón, Estefanía Villafranca, Salvador Lozano, Alberto Donate, Isabel Sánchez-Martínez.

RESEARCH MAIN TOPICS

- IPM. Genetic improvement of biological control agents.
- Impacts of Plant Protection Products (PPPs).
- Biotechnological tools-DNA markers for identification of agricultural pests.
- Fungal plant disease diagnosis and Postharvest pathology



PLANT GENETIC RESOURCES AND SUSTAINABLE HORTICULTURAL TECHNOLOGY

RESPONSIBLE: María José Vicente

STAFF:

SENIOR and POSTDOC RESEARCHERS: José Antonio Franco, Juan José Martínez Sánchez, Sebastián Bañón, Juan A Fernández, Catalina Egea, Juan Esteva, Encarnación Conesa, Jesús Ochoa, Mª Carmen Martínez Ballesta, Pablo García Gómez, Almudena Giménez Martínez, Víctor Gallegos Cedillo, Angelo Signore.

PREDOC: Rachida Rania Benaissa, Francisco José Quirante Moya, Richard Yudin.

TECHNICIANS: Noelia Durán López, Francisca Andreo Mari.

RESEARCH MAIN TOPICS

- Recovery and conservation of plant genetic resources (threatened flora species)
- In the last years the group has focused on the development of integrated conservation strategies and advances in knowledge of *Cistus heterophyllus* subsp. *carthaginensis*, the only species of flora declared in a critical situation by the Spanish government.
- Improving the sustainability of irrigation in greenhouse production in semi-arid regions

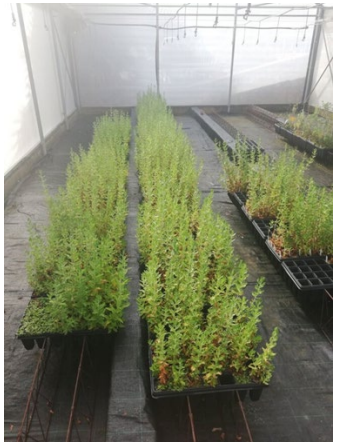
This line aims to optimise irrigation management when using non-conventional water (saline water, treated wastewater, and desalinated water). The objectives are:

1) Reduce water consumption.
2) Minimise the impact of salts and other nutrients in the water.

The challenges are:

1) to design salinity indices based on sensor outputs.
2) to analyse plant responses to water and/or salt stress.
3) to establish relationships between plant responses and salinity indices.
4) to determine threshold values of the salinity indices for different species and varieties.

- Intensify agricultural production technology by:
  5) Hydroponic cultivation of baby leaf vegetables
  6) Use of LED lighting for indoor cultivation of leafy vegetables.
  7) Introduce and adapt new crops, optimizing nursery cultivation of crops
  8) Use of compost from agri-food industry in vegetable production.
  9) Influence of preharvest treatments in the field on postharvest shelf life of vegetables.
- Sustainable agricultural production:
  - Develop of cultural techniques to improve soil quality and crop yield and quality
  - Organic fertilization strategies
  - Plant Physiology under abiotic stress



GENETIC ENGINEERING OF DEVELOPMENT AND METABOLISM

RESPONSIBLE: Julia Weiss

STAFF

SENIOR and POSTDOC RESEARCHERS: Marcos Egea Gutiérrez-Cortines

PREDOC: Fuensanta Verdú Navarro, Alberto Gila Navarro

TECHNICIANS: Ángela Espín Veracruz

RESEARCH MAIN TOPICS

Obtaining new varieties of cannabis with high cannabinoid content

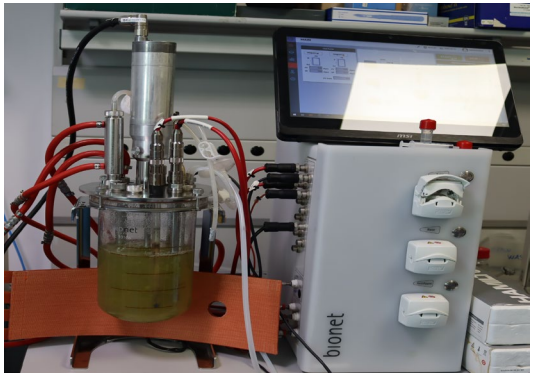
- Genetic control of the synthesis of THC, CBD and terpenes
- Environmental effects on production
- Flower development

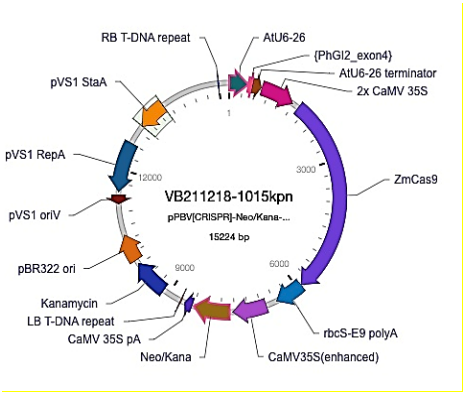
Genetic improvement of cells for culture in bioreactors

- Callus quality (growth, friability)
- Growth in bioreactors (growth speed, culture density etc.)

Validation of genes that coordinate growth and emission of volatiles with biotechnological potential

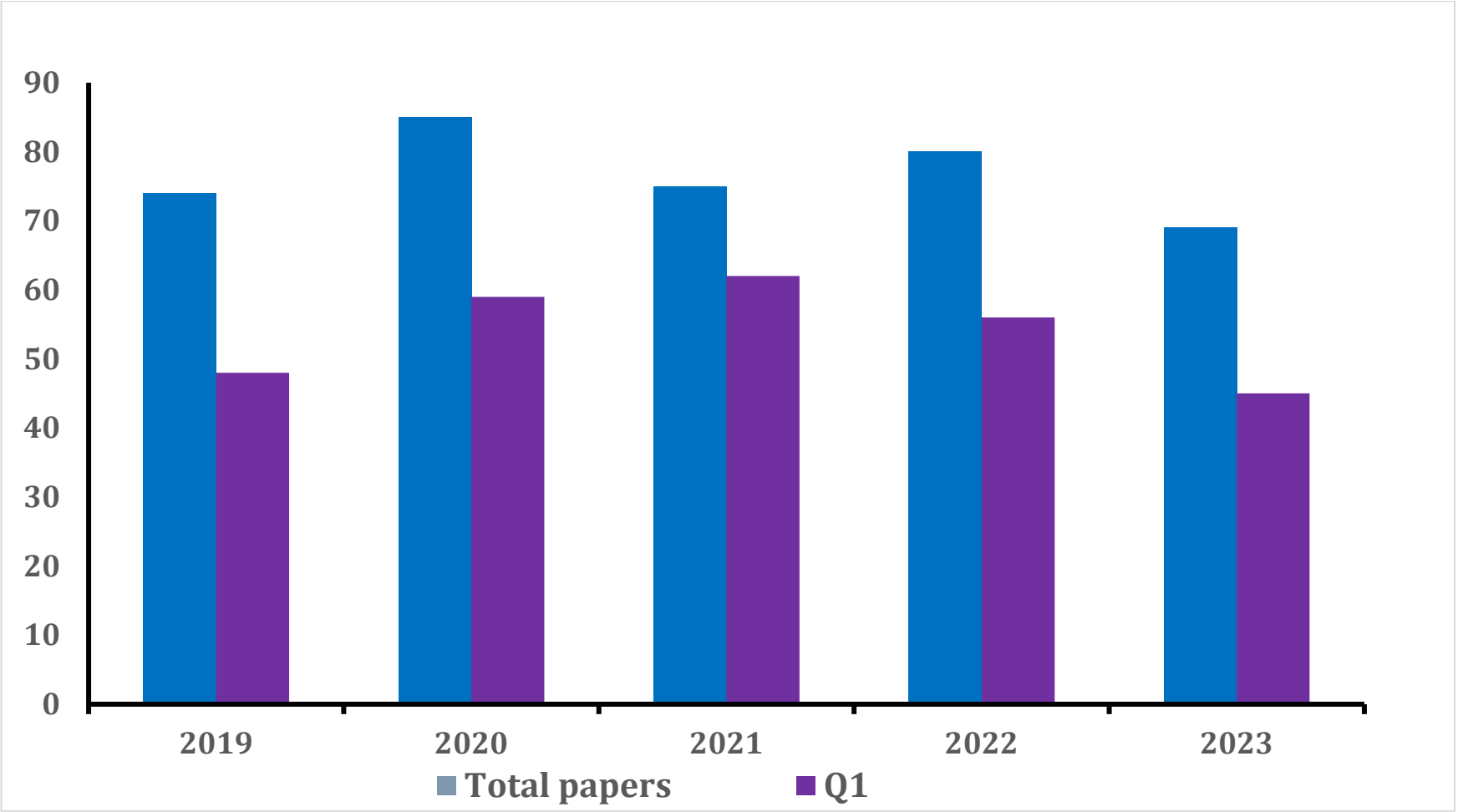
- Gene knock down using Crispr/Cas9 technology in the model plant *Petunia x hybrida*
- Genetics of heterosis in Arabidopsis



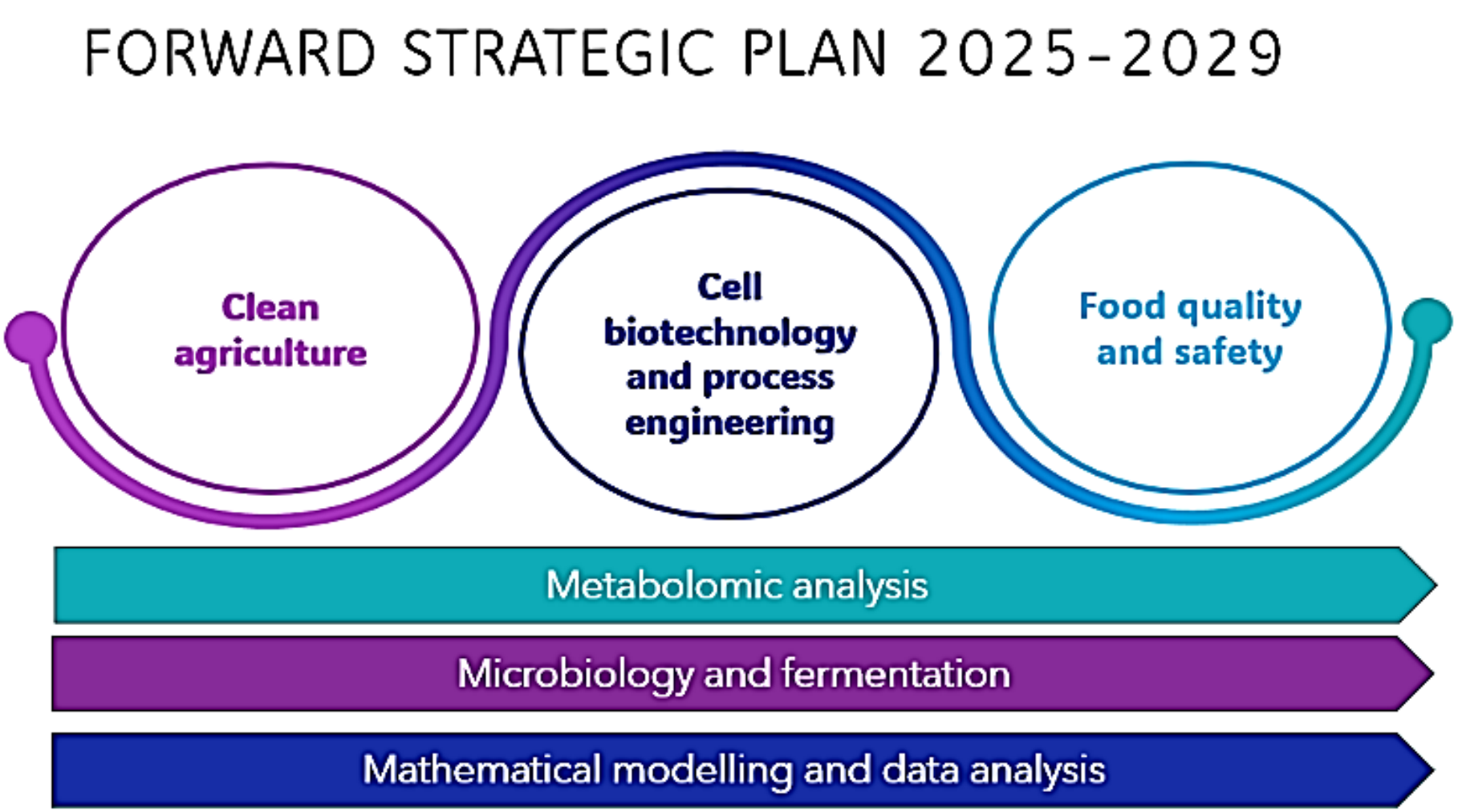


PUBLICATIONS 2019-2023

Evolution of scientific papers 2019-2023



FORWARD STRATEGIC PLAN, PREVISION OF STAFF RECRUIMENT AND EXPECTED INSTRUMENTS ADQUISITION


FORWARD STRATEGIC PLAN 2025-2029
Clean agriculture
Cell biotechnology and process engineering
Food quality and safety
Metabolomic analysis
Microbiology and fermentation
Mathematical modelling and data analysis

PREVISION OF RECRUITING - IBV							
	Group leaders Full Time Equivalent (FTE)(*)	Senior Researchers Full Time Equivalent (FTE)(*)	Postdoc (not postdoctoral trainees) Full Time Equivalent (FTE)(*)	Technical Full Time Equivalent (FTE)(*)	Other Full Time Equivalent (FTE)(*)	TOTAL Full Time Equivalent (FTE)(*)	Number of people
Area A: Biotech Process	1	1	1	2	0	5	5
Area B: Food Quality	0	1	1	1	0	3	3
Area C: Soil Ecol Biotech	0	0	1	1	0	2	2
Area D: Secondary metabolites	0	0	1	0.5	0	1.5	2
Area E: Microbiol and Food Safety	0	1	1	1	0	3	3
Area F: Integrated pest management	0	2	1	2	0	5	5
Area G: Plant Genetic Resources	0	3	1	1	0	5	5
Area H: Genetic engineering	0	1	1	1	0	3	3
Area: IBV core	0	0	0	1	0.5	1.5	2
TOTAL	**1**	**9**	**8**	**10.5**	**0.5**	**29**	**30**

ACQUISITION OF SCIENTIFIC-TECHNOLOGICAL EQUIPMENT FOR A COMMON RESEARCH SERVICE - FEDER

Cell and Biomolecule Production Laboratory - IBV

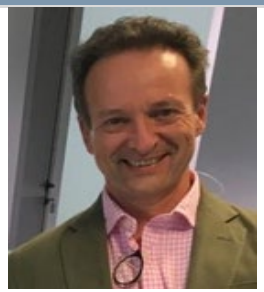
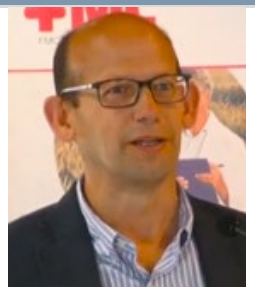
1. Bioreactors
2. Autoclave

3. Preparative HPLC with SFC
4. Refrigerated centrifuge
5. Flow cytometer
6. Spray dryer
7. Microwave synthesis reactor

8. UPLC
9. Automated cell phenotyping system

Total taxable base	1,150,736.55 €
VAT:	241,654.68 €
Total:	1,392,391.23 €
FEDER founding (transition regions: 60%):	835,434.74 €

DIRECTION BOARD CONTACT INFORMATION

PROF. DR. MARCOS EGEA GUTIERREZ-CORTINES DIRECTOR	DR. HECTOR CONESA ALCARAZ VICE DIRECTOR	PROF. DR. PABLO BIELZA LINO SECRETARY
		
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	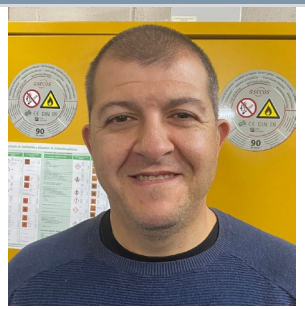	
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