



Universidad
Andrés Bello®

MAGÍSTER EN BIOTECNOLOGÍA Y CIENCIAS DE LA VIDA
FACULTAD DE CIENCIAS DE LA VIDA

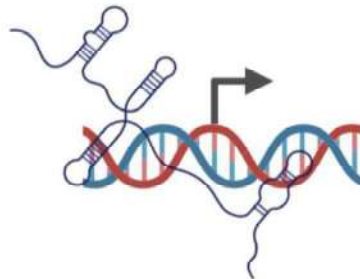
Líneas de Investigación Académicos del Claustro

What we study

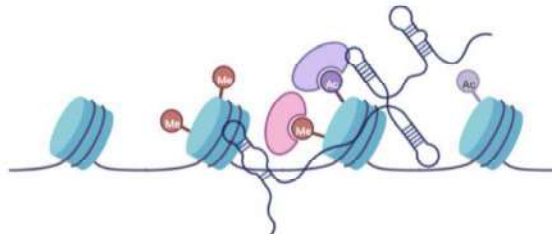
We study molecular mechanisms where RNAs are the main characters. We aim to understand how RNAs govern gene expression in healthy and diseased cells.



Sites relevant for function

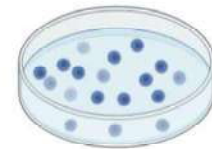


Control of gene expression



Collaboration with epigenetic enzymes

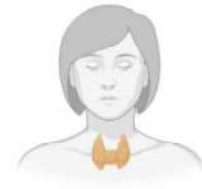
What we use



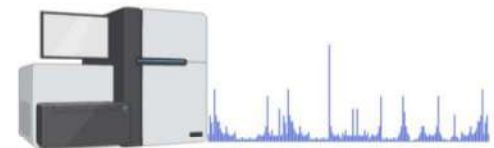
Cell culture



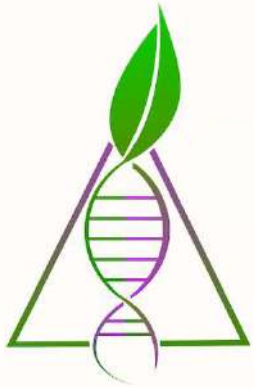
Organoids



Patient samples



**Deep sequencing
and bioinformatics**



Laboratorio de Regulación del Genoma Vegetal

Dr. José Miguel Alvarez

En el laboratorio estamos interesados en entender como las plantas se adaptan a la sequía. Estudiamos la regulación transcripcional como un proceso clave para desarrollar estrategias que permitan generar plantas con mayor resistencia a la carencia de agua.

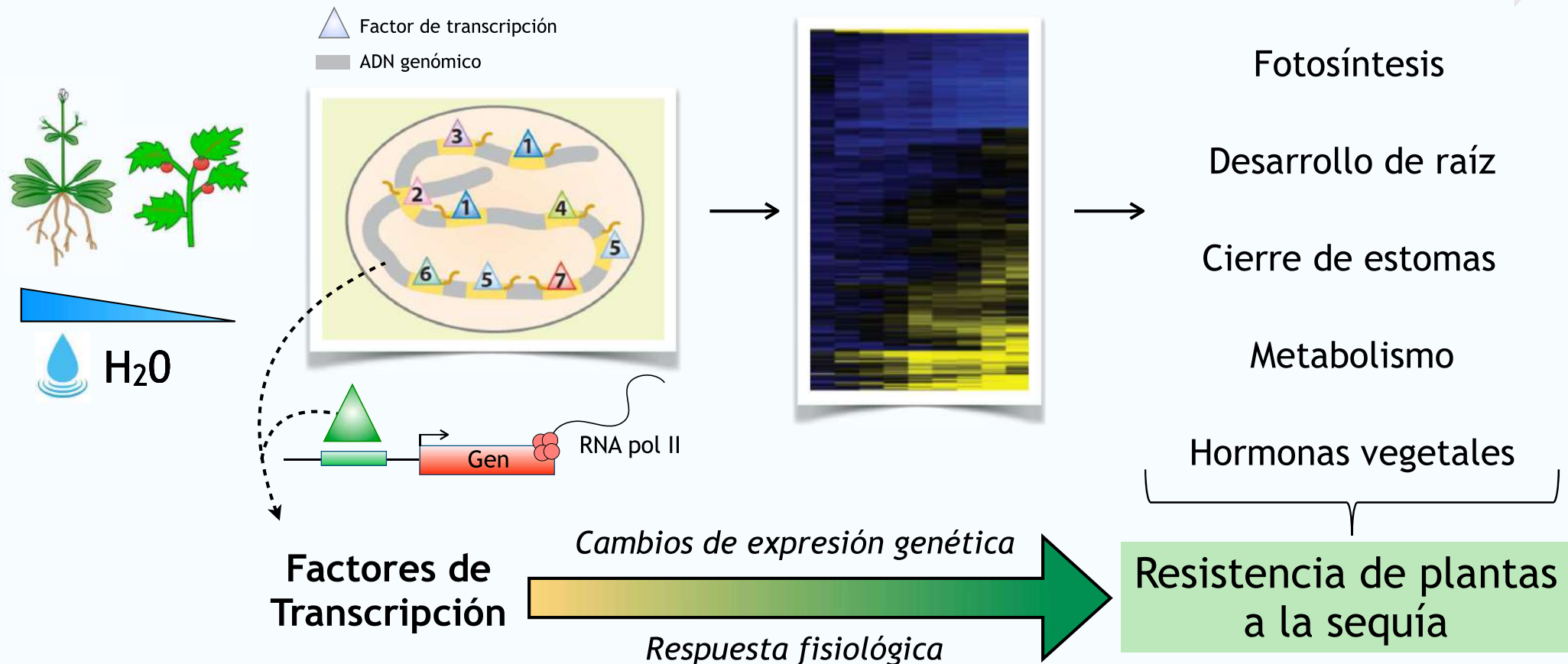


Sequía

Regulación
transcripcional

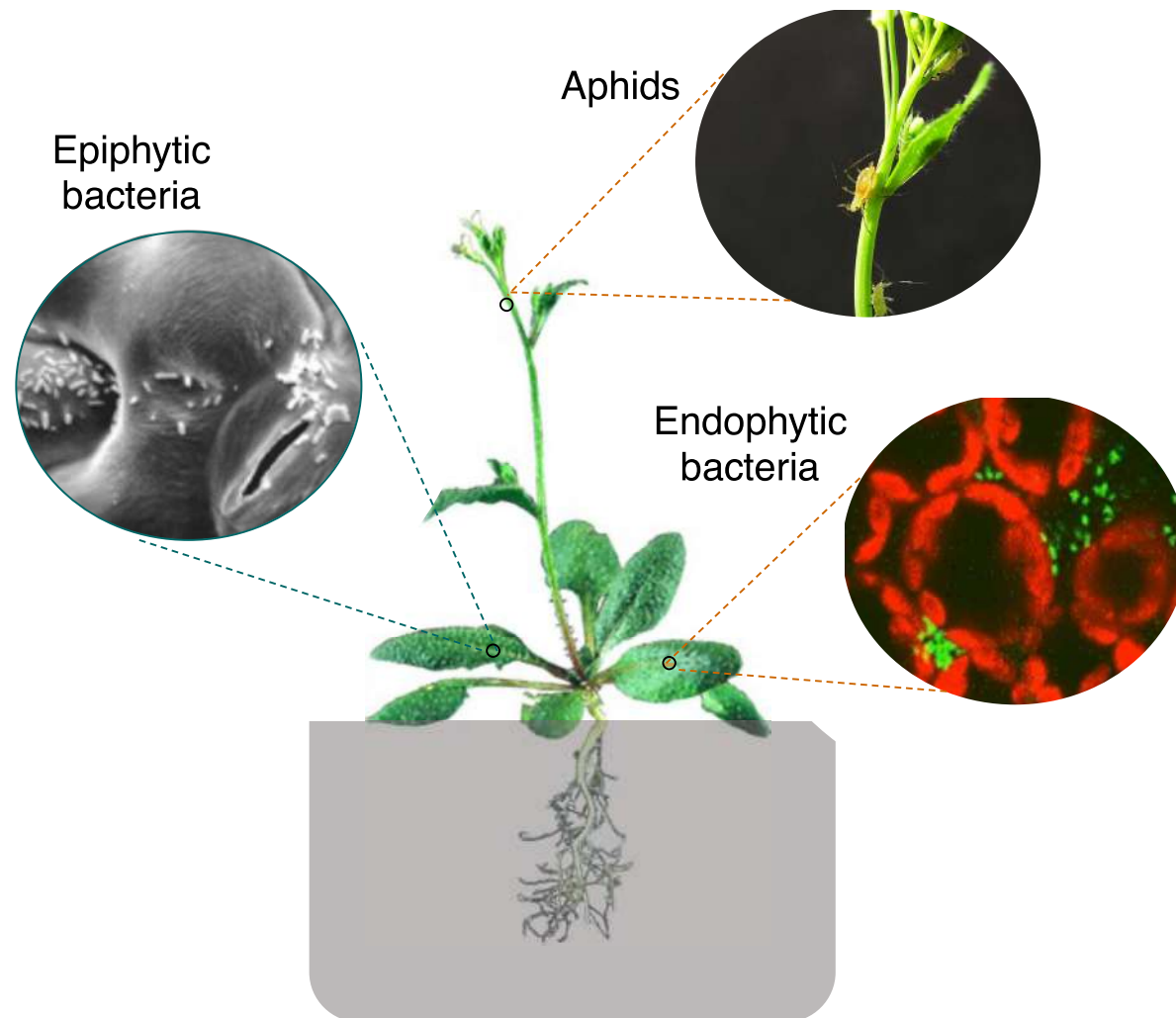
Expresión genética
a escala global

Respuesta
fisiológica



Plant Pathology Lab
Dra. Francisca Blanco-Herrera

PLANT
PATHOLOGY
GROUP



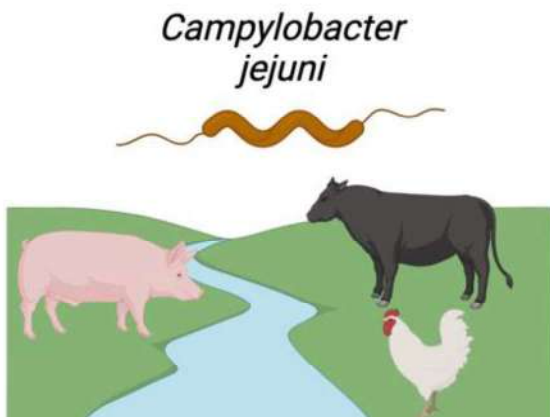
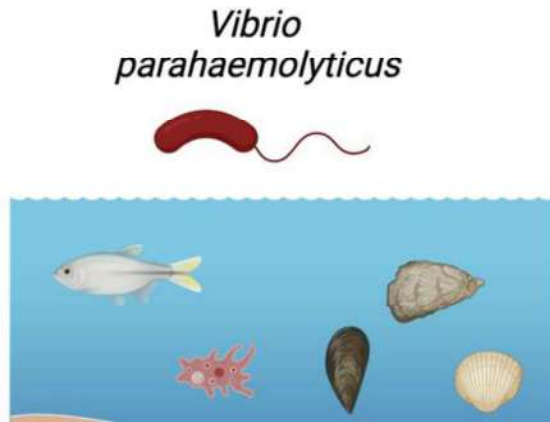
Aim. To understand the signaling pathways involved in plant responses to pathogen infections and how the pathogen manipulates the host to its benefit.

Specific Aims.

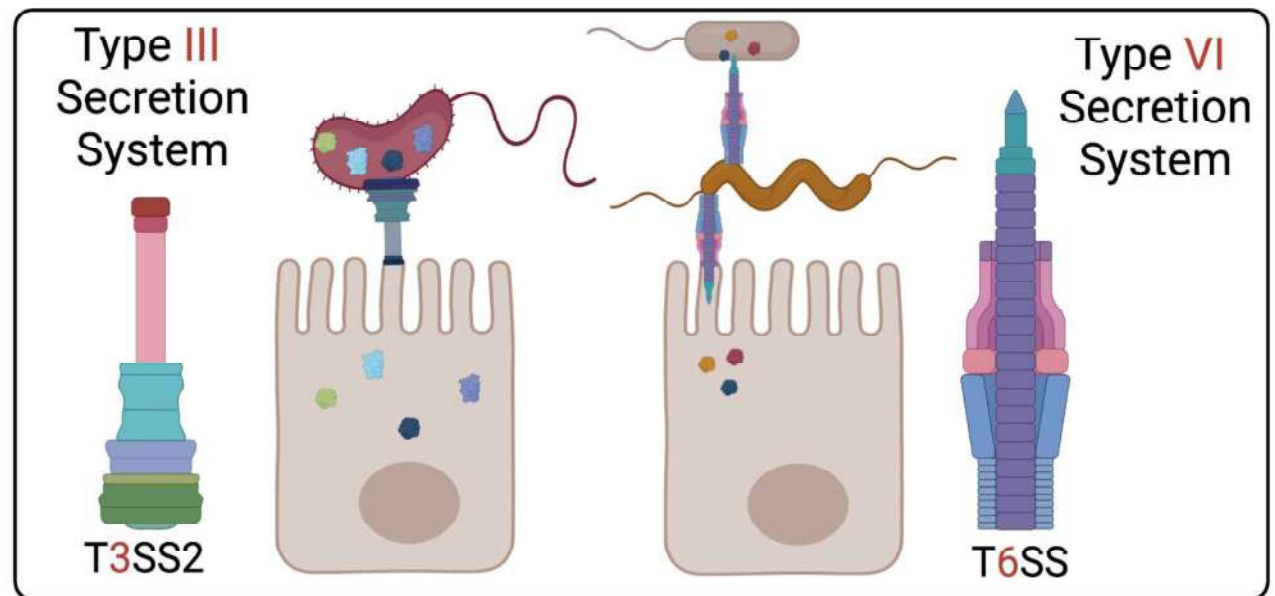
Analyze the tradeoff between defense response and development. Characterization of the structure and function of the cell wall and the involvement of hormones in the physiological process triggered by the infection/infestation of different model plants.

Methodology. Using system biology approaches to integrate the omics data into genome-scale metabolic models of both pathogens and hosts, to better understand the underlying mechanisms governing plant immunity and growth responses that finally lead to the pathogen success and plant sickness.

“Nuestro objetivo es contribuir a la comprensión de los mecanismos moleculares y celulares a través de los cuales las bacterias interactúan con sus hospederos y causan enfermedad”



Imágenes hechas en biorender



Patógenos humanos ambientales como modelos para comprender la evolución de la virulencia bacteriana



Dr. Cristian Bulboa Contador

Profesor Asociado

Departamento de Ecología y Biodiversidad
Centro de investigaciones Marinas de Quintay
Facultad de Ciencias de la Vida
Universidad Andrés Bello
cbulboa@unab.cl



¿Qué estudiamos?

- ✓ Estrategias de reproducción
- ✓ Ciclos de vida
- ✓ Primeros estados de desarrollo
- ✓ Crecimiento

¿Qué desarrollamos?

- ✓ Tecnologías de cultivo
- ✓ Tecnologías de repoblamiento/restauración
- ✓ Producción de semillas
- ✓ Domesticación de especies de valor comercial

Botánica Marina
Ficología Aplicada
Acuicultura de algas

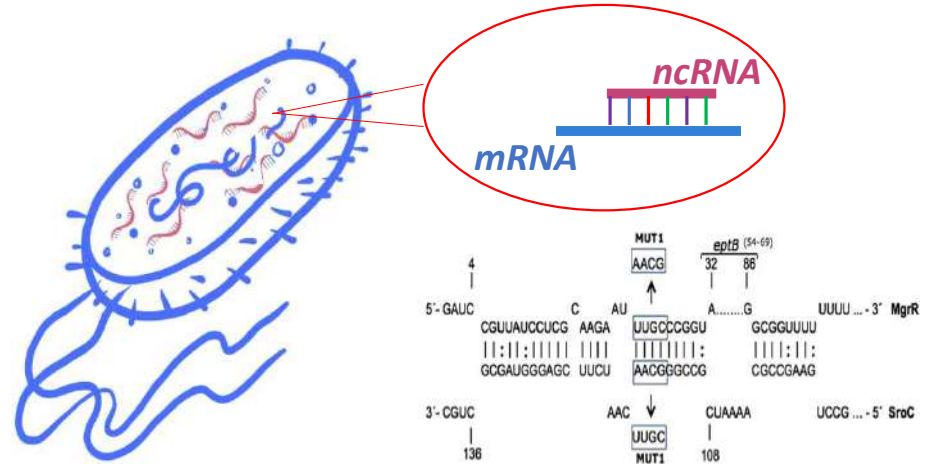


Bacterial RNAs Lab



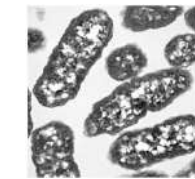
Dr. Iván Calderón

"We are interested in understanding how bacterial pathogens regulate their physiology, virulence and multiple stress responses by modulating gene expression with non-coding RNAs (ncRNAs) and other molecular factors. Our study models include salmonid and human pathogens, and we use molecular genetic techniques and biochemical assays"

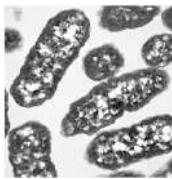


Gene expression regulation

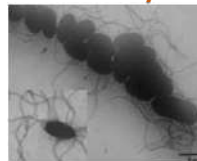
Virulence



Antibiotic
&
Stress Responses



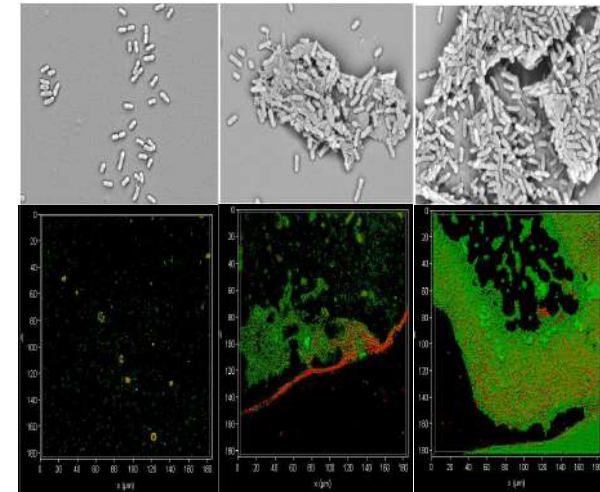
Motility



Metabolism



Biofilm formation



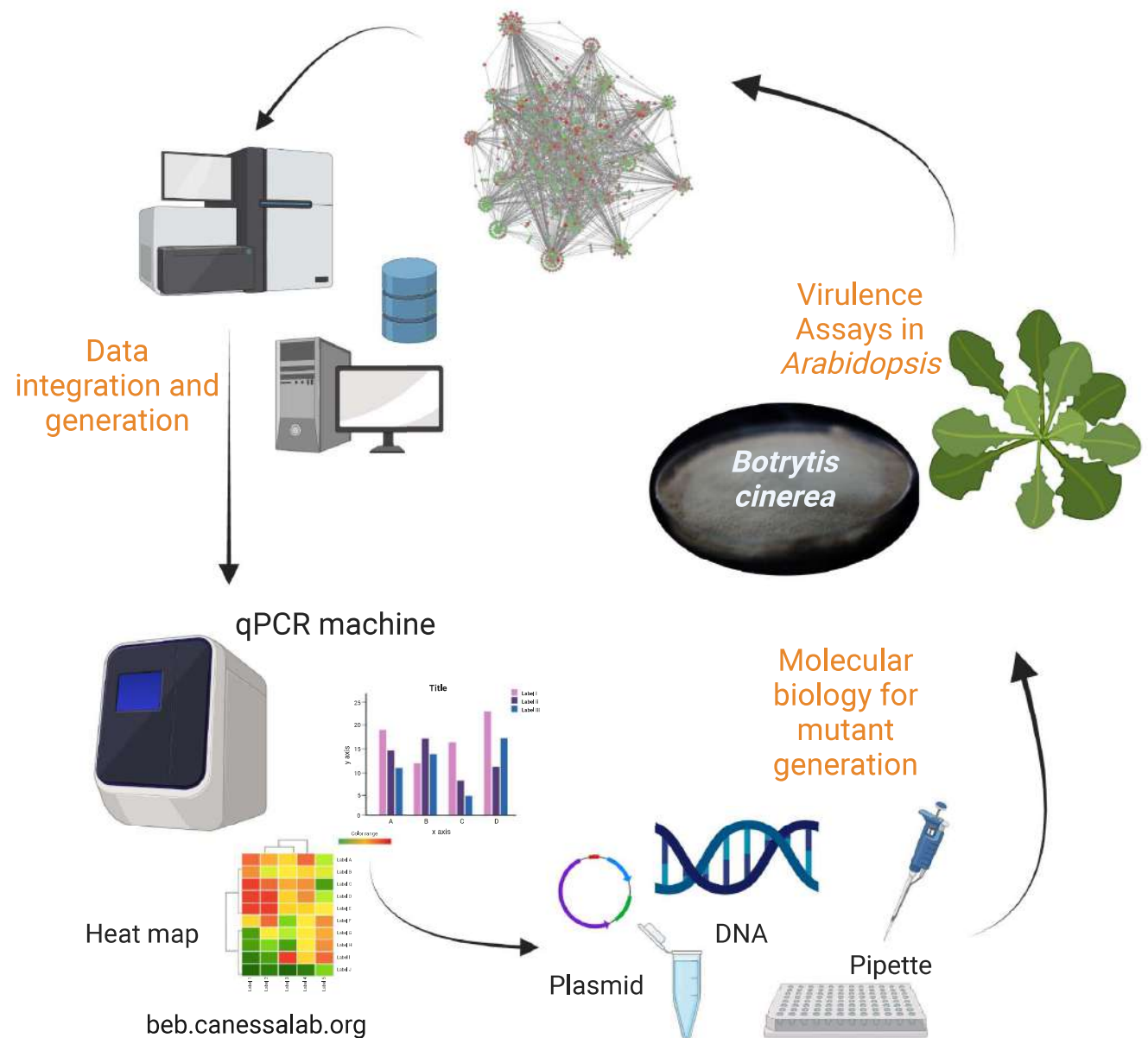
Plant-Fungal Interaction Lab

www.canessalab.org

Dr. Paulo Canessa

The Canessa lab is a fungal-oriented laboratory moved by understanding the role of the environment and how genes and their interactions with environmental signals (e.g., nutrients and light) modulate the outcome of the plant-pathogen interaction.

For this purpose, we use **genomic data** analysis, predictive bioinformatic strategies, as well as **classic molecular approximations** (functional genomics, gene *knockout* and *knockin*), employing the fungal phytopathogen *Botrytis cinerea* to perform **virulence assays** in *Arabidopsis thaliana*.



**LABORATORIO DE ECOLOGÍA
Y BIOLOGÍA MOLECULAR
EN ALGAS**

Más

Dra. Loretto Contreras Porcia

<https://www.lebma.cl/>

Mis líneas de investigación se centran en responder preguntas ecológicas relacionadas con las algas marinas mediante la aplicación de herramientas moleculares, que incluyen métodos bioquímicos, proteómicos, transcriptómicos y metabólicos. Muchos de mis proyectos actuales tienen como objetivo describir los mecanismos de tolerancia empleados por diversas especies de algas en condiciones ambientales variadas cuando se enfrentan a estresores naturales o antropogénicos. El objetivo final de esta investigación es comprender el patrón de distribución de las algas marinas dentro de un marco ecológico-económico y a escalas locales-regionales. Otra línea de investigación en curso bajo mi dirección es el uso de compuestos y derivados de algas marinas (por ejemplo, biochar) con funciones nutraceuticas y aplicaciones ambientales. Además, en los últimos años he dedicado tiempo a trabajar en la taxonomía clásica-molecular de las algas rojas, algas de particular importancia económica para Chile.

Contacto: lorettocontreras@unab.cl
loretto.contreras@gmail.com

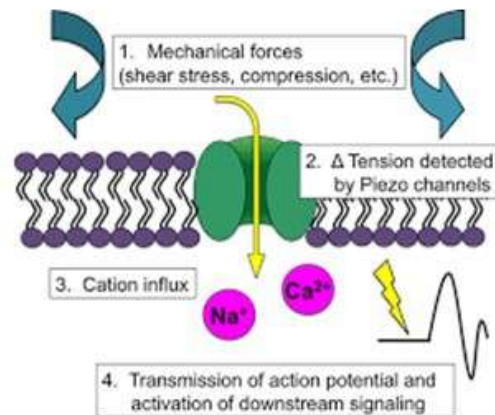
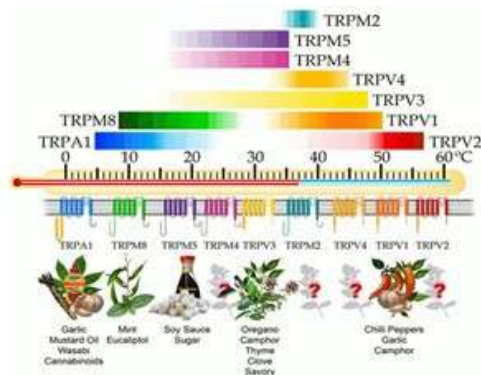


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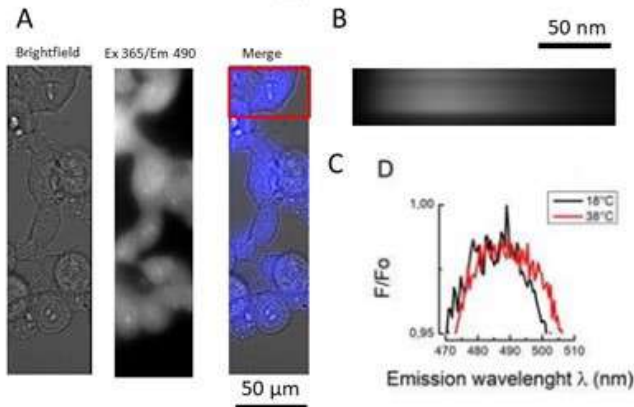
CBI CENTER FOR BIOINFORMATICS
& INTEGRATIVE BIOLOGY

Molecular Physiology Lab

Dr. Ignacio Diaz Franulic



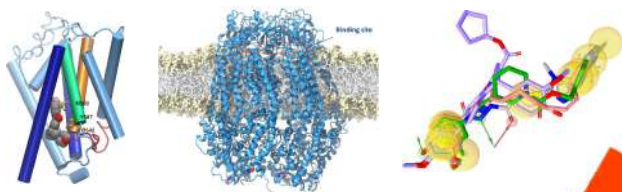
Living organisms detect physical stimulus using a repertoire of molecular sensors called ion channels. Our lab focuses on understanding the structure/function relationships of temperature- and mechanogated ion channels by combining site- directed mutagenesis, patch clamp electrophysiology and fluorescence spectroscopy.



Drug Discovery and delivery Lab

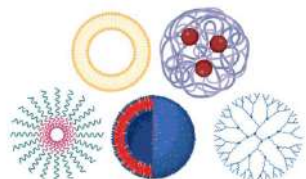
Dr. Yorley Andrea Duarte

Drug Design



- Computer-aided drug design.
- Chemoinformatics.
- Hemichannels, AChE, Fxa, PAR receptors.

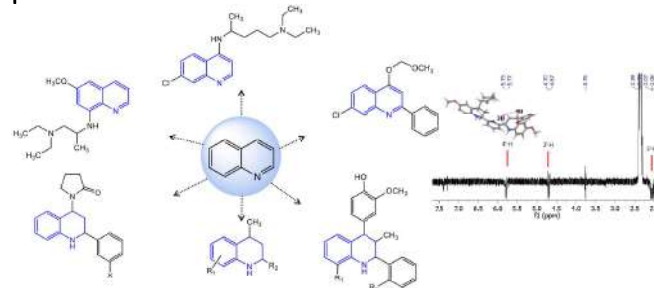
Drug Delivery systems



- Nanosystems.

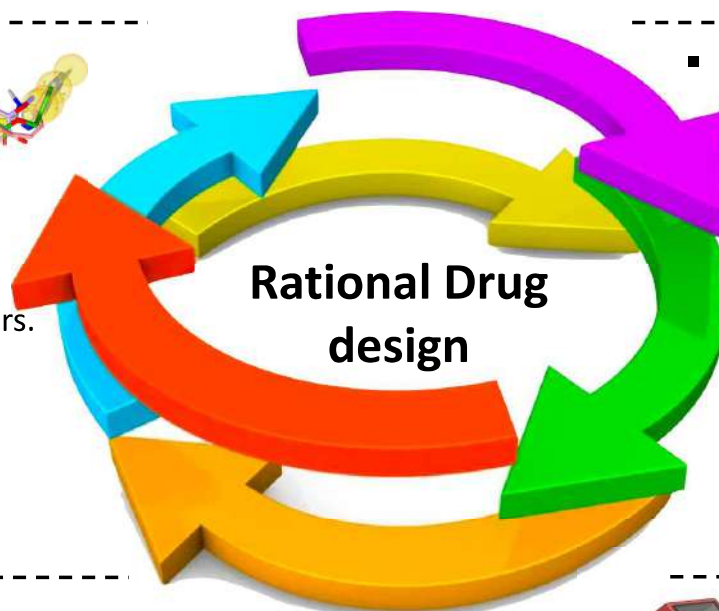
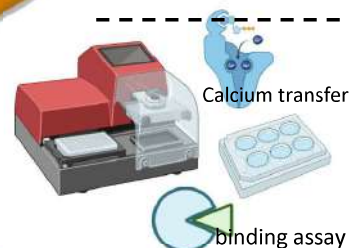
Chemical Synthesis

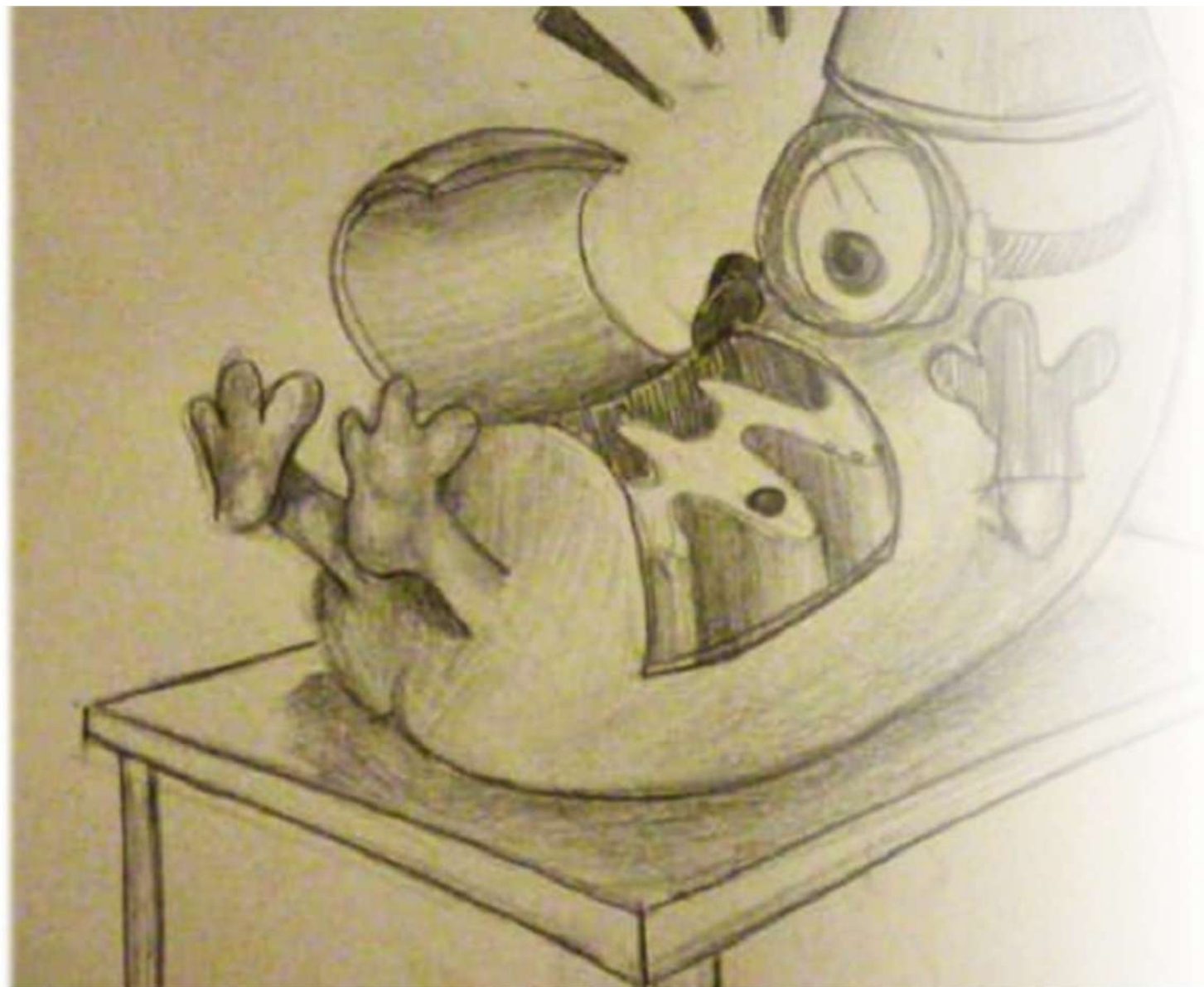
- Synthesis and characterization, quinoline scaffold.



Biological Assays

- Cytotoxicity assay kit
- In vitro enzymatic activity assay.





Lab. de Medicina Mitocondrial
Dr. Alvaro A. Elorza

Lineas de Investigación

- Mitochondria en Cancer de Tiroides y Bucal
- Heteroplasmía mitocondrial en el envejecimiento
- Caracterización de nuevas proteínas mitocondriales de la mitofagia.
- Función mitocondrial y mitofagia en la diferenciación de células madre hematopoyéticas.
- Mitofagia en la sarcopenia primaria

Contacto: alvaro.elorza@unab.cl

Fish Immunology Lab

Dr. Carmen Gloria Feijóo



We aim to understand, at the cellular and molecular level, how immune cells participate in the induction of intestinal tolerance and inflammation using zebrafish as animal model.

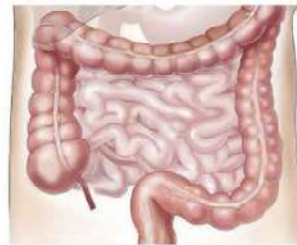
Food



Oral Tolerance



Inflammation



t cell



Macrophage



Dendritic cell

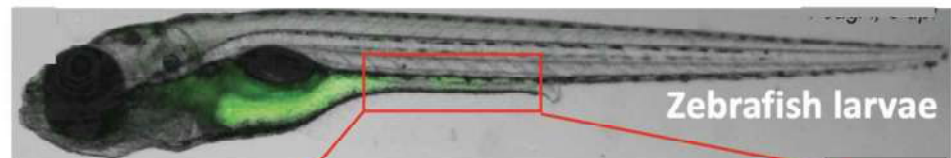
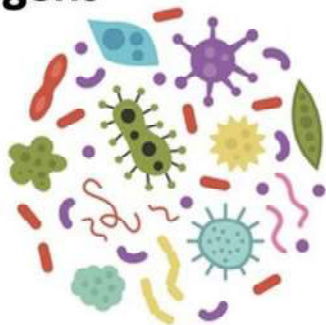


neutrophil

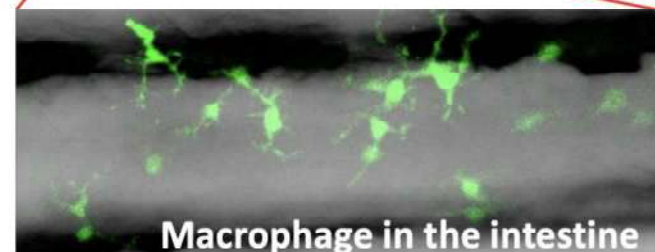


B cell

Pathogens



Zebrafish larvae



Macrophage in the intestine

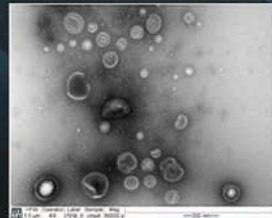
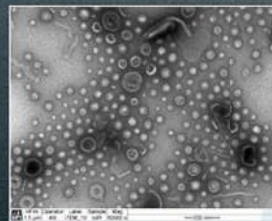
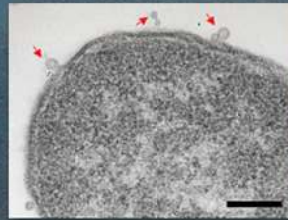


Laboratorio de Genética y Patogénesis Bacteriana

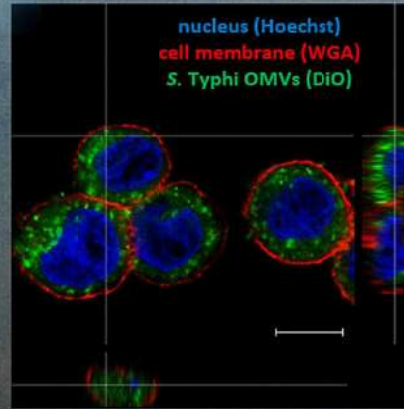
Facultad de Ciencias de la Vida
Departamento de Ciencias Biológicas
Dr. Juan Fuentes



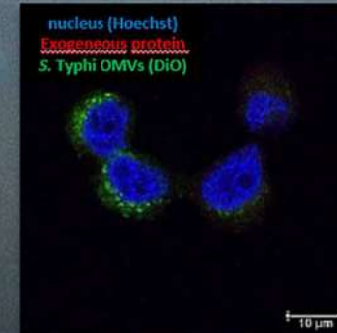
Bacterias Gram negativo



Vesículas de membrana externa bacterianas (OMVs)



Interacción de OMVs con células eucariontes



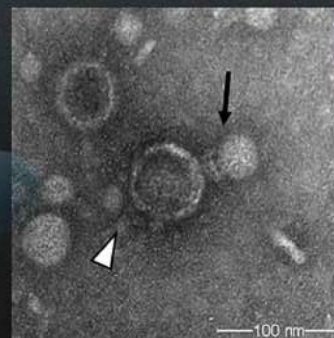
Entrega de proteínas exógenas a células eucariontes vía OMVs



Ensayo de inmunoprotección basados en OMVs



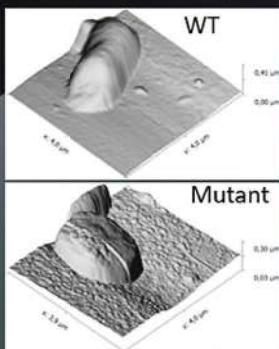
DNA entregado por OMVs expresado en células eucariontes



Interacción de OMVs con bacteriófagos

- Genética Bacteriana
- Factores de virulencia
- Interacción patógeno hospedero
- Vesículas de membrana externa bacterianas (OMVs)
- Biotecnología microbiana

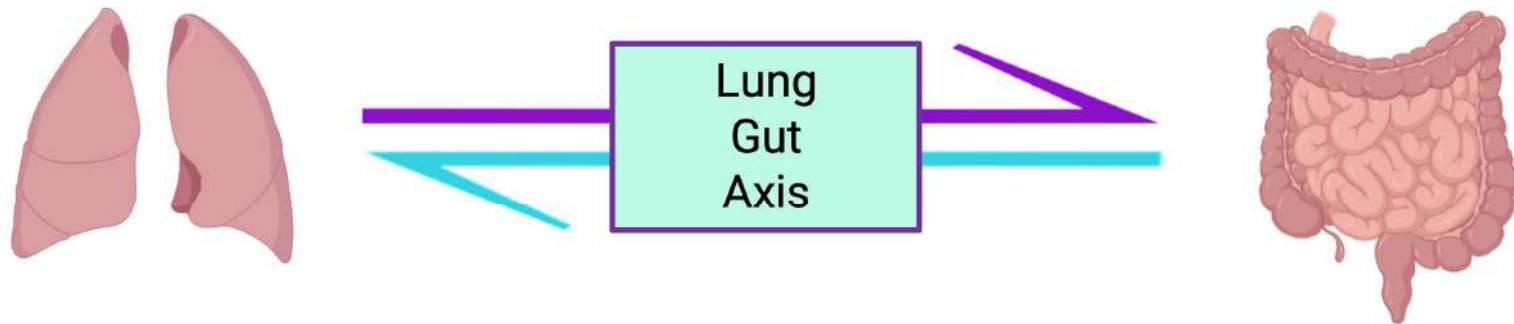
Mutantes hipervesiculadoras



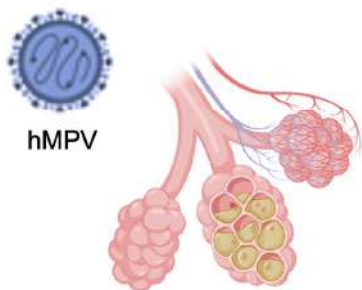
Laboratory of Systemic Immunointeractions and Intestinal Microbiota

Dr. Felipe Melo-González

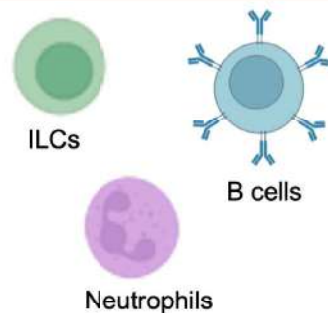
We aim to understand the regulation of the lung-intestine axis by different immune cells and the role of the microbiota in animal models of infection and inflammation of the respiratory and intestinal mucosa.



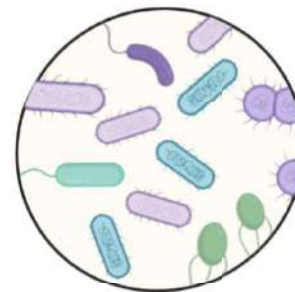
Role of viral pathogen infections in pneumonia and intestinal inflammation



Alteration of immune populations in intestinal and lung inflammation



Role of intestinal microbiota in respiratory and intestinal inflammation



Changes in intestinal morphology and cytokine production during inflammation

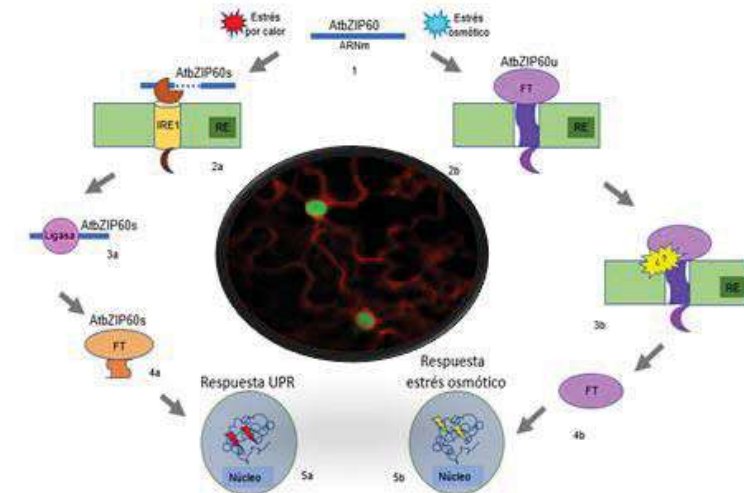
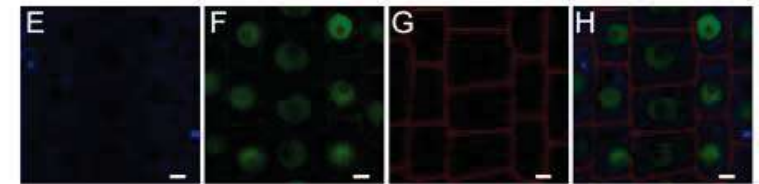
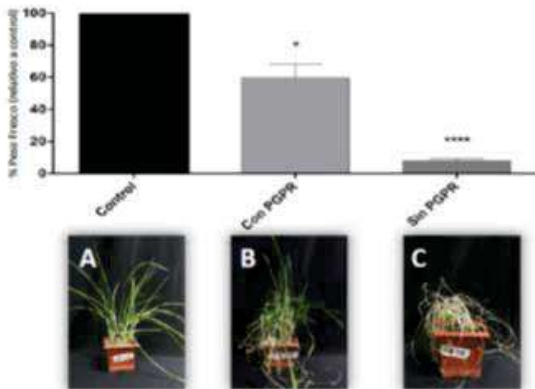


Laboratorio de Resiliencia y Señalización

Dr. Adrian A. Moreno

Our laboratory is interested to explore, at celular and molecular level, the signaling between organelles and the nucleus upon plant exposure to abiotic stress, using the endoplasmic reticulum to the nucleus signaling as a model.

In addition, we are studying and collaborating on solutions to increase plant tolerance to abiotic stress such as the use of plant growth-promoting rizhobacteria (PGPR) and nanotechnology.



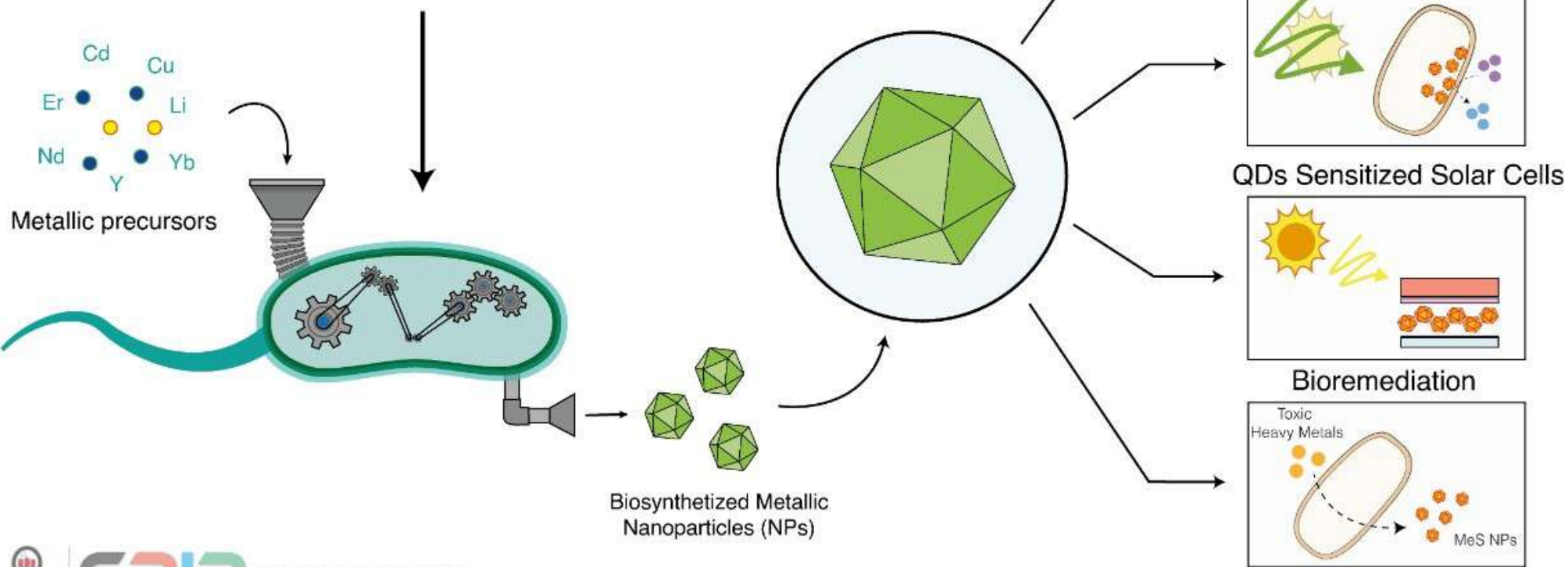


BioNanotechnology and Microbiology Lab

Dr. José Manuel Pérez-Donoso



We isolate bacteria from extreme chilean environments to produce metal nanoparticles of technological interest



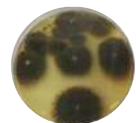


Desarrollo de productos para el
control de fitopatógenos fúngicos

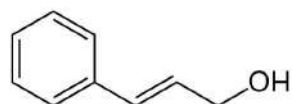
Hongos biocontroladores
mejorados (BCm)



Clonostachys



Chaetomium



Compuestos
antifúngicos volátiles

Sistema de encapsulamiento y
liberación controlada
"GAS EN POLVO"

Fabricación de
Prototipos antifúngicos
para uva de exportación

Empresa Asociada:



Fungicida basado en
Metabolitos
Termoestables



Botrytis cinerea (Bc):
Pudrición gris
en uva de mesa



Neofusicoccum parvum (Np)
Diplodia seriata (Ds)

Sistemas de diagnóstico para
hongos de la madera de la vid

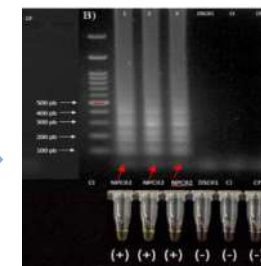


Phaeomoniella chlamydospora (Pc)
Np, Ds y Pc : Enfermedades de la
madera de la vid (GTDs)

Empresa Asociada:



-Identificación de
genes blanco
-Selección de
regiones específicas
-Diseño partidores /
amplificación
isotérmica (LAMP)

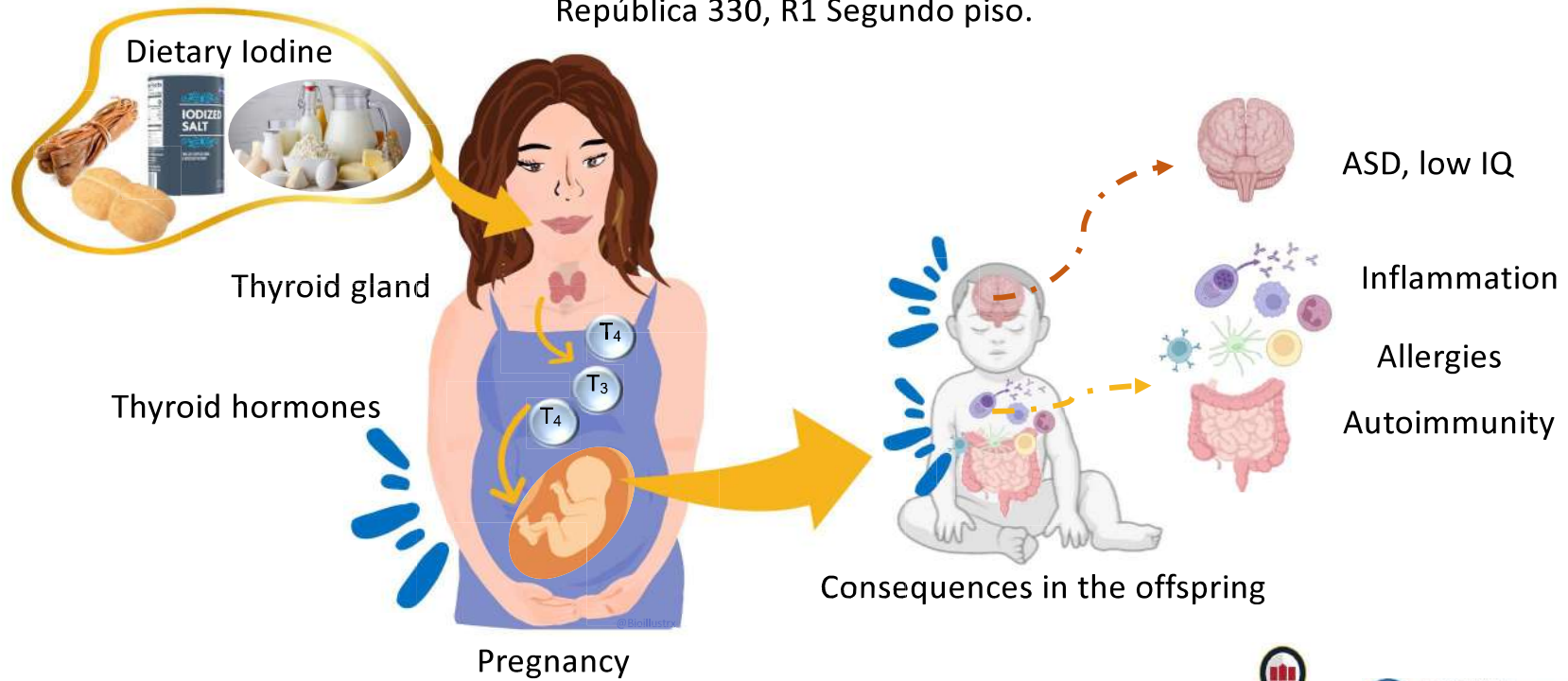


KIT para detección
de hongos de la
madera de la vid

Laboratory of Endocrine & Immunology

Dr. Claudia Riedel

República 330, R1 Segundo piso.



IMPRINTING OF MATERNAL
HYPOTHYROIDISM IN THE OFFSPRING

Our research focus to elucidate the mechanisms and the consequences of maternal thyroid hormone deficiency during pregnancy over the function of central nervous system, intestine and immune system of the offspring

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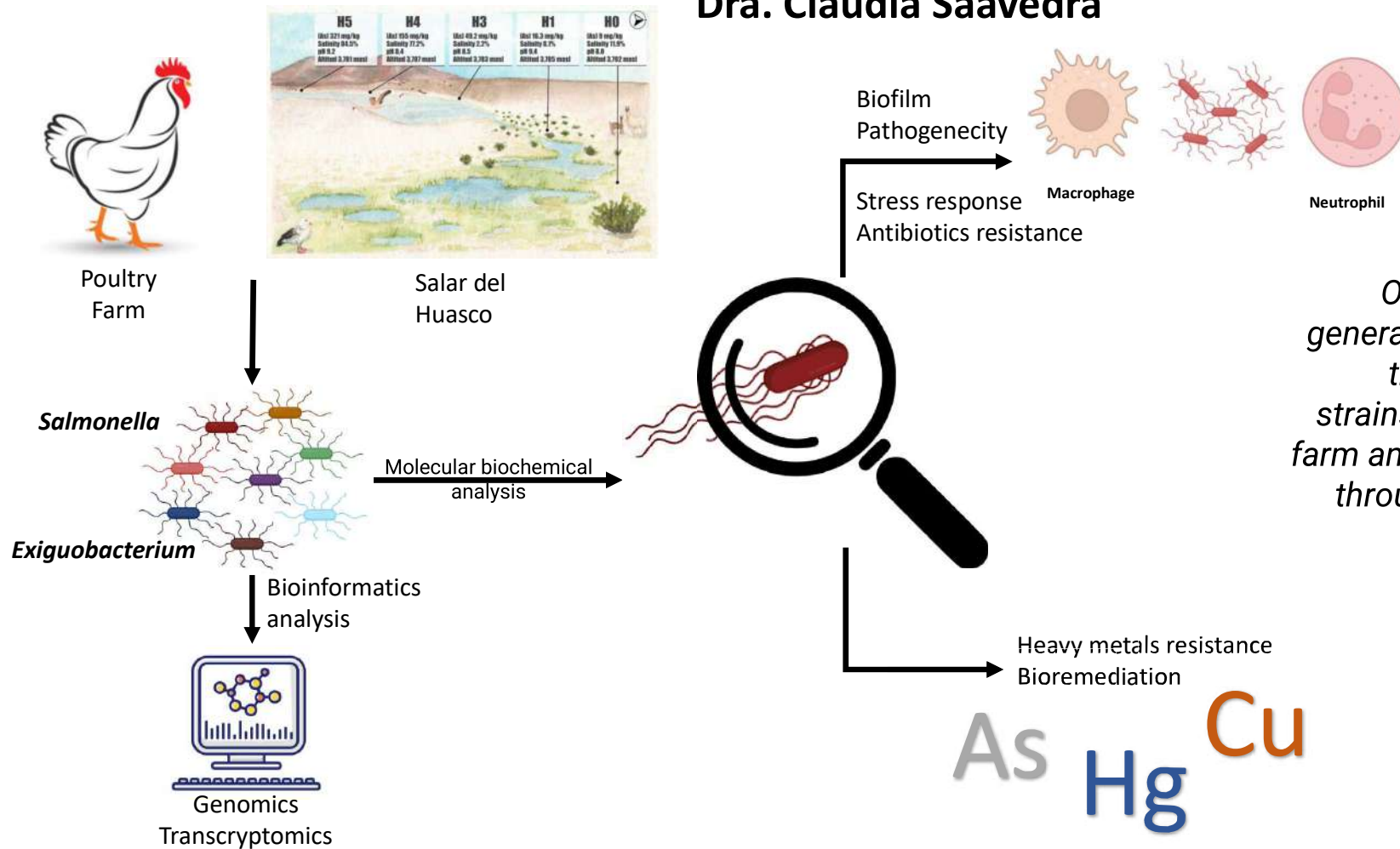
Instituto Milenio
INMUNOLOGÍA E
INMUNOTERAPIA

Agencia
Nacional de
Investigación
y Desarrollo
Ministerio de Ciencia
Tecnología e Innovación
Gobierno de Chile

Molecular Microbiology Lab



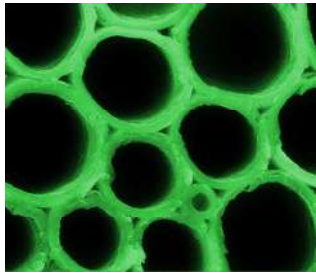
Dra. Claudia Saavedra



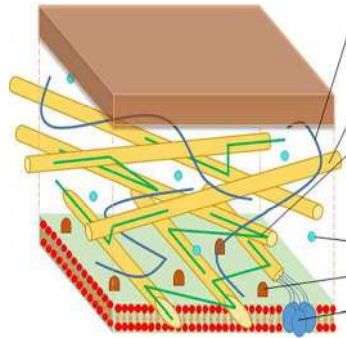
Our objective is to study the general biological processes and the evolution of Salmonella strains emerging from a chicken farm and of extremophile bacteria through genetic, molecular and biochemical approaches.

MUCILAB WORK: TRY TO UNDERSTAND THE BIOSYNTHESIS AND MODIFICATION OF PLANT CELL WALL POLYSACCHARIDES

Susana Sáez PhD

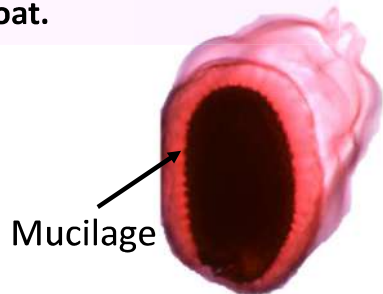


1.-The plant cell wall is a complex structure with represent the fist barrier of plant cells against environmental cues



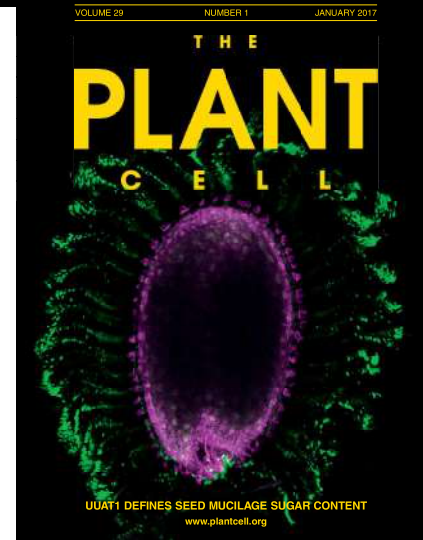
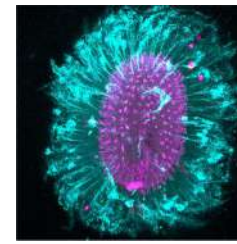
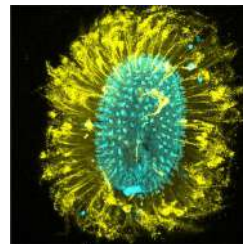
2.-The plant primary cell wall is composed of cellulose , hemicelluloses and pectin. Our laboratory search to investigate how pectin are synthetized and modified

3.-Our laboratory use the mucilage as a tool to understand pectin metabolism. **Mucilage is a gel like structure produce by the seed coat.**



4.- We are working on the on the characterization of more than **10 genes acting on mucilage formation.**

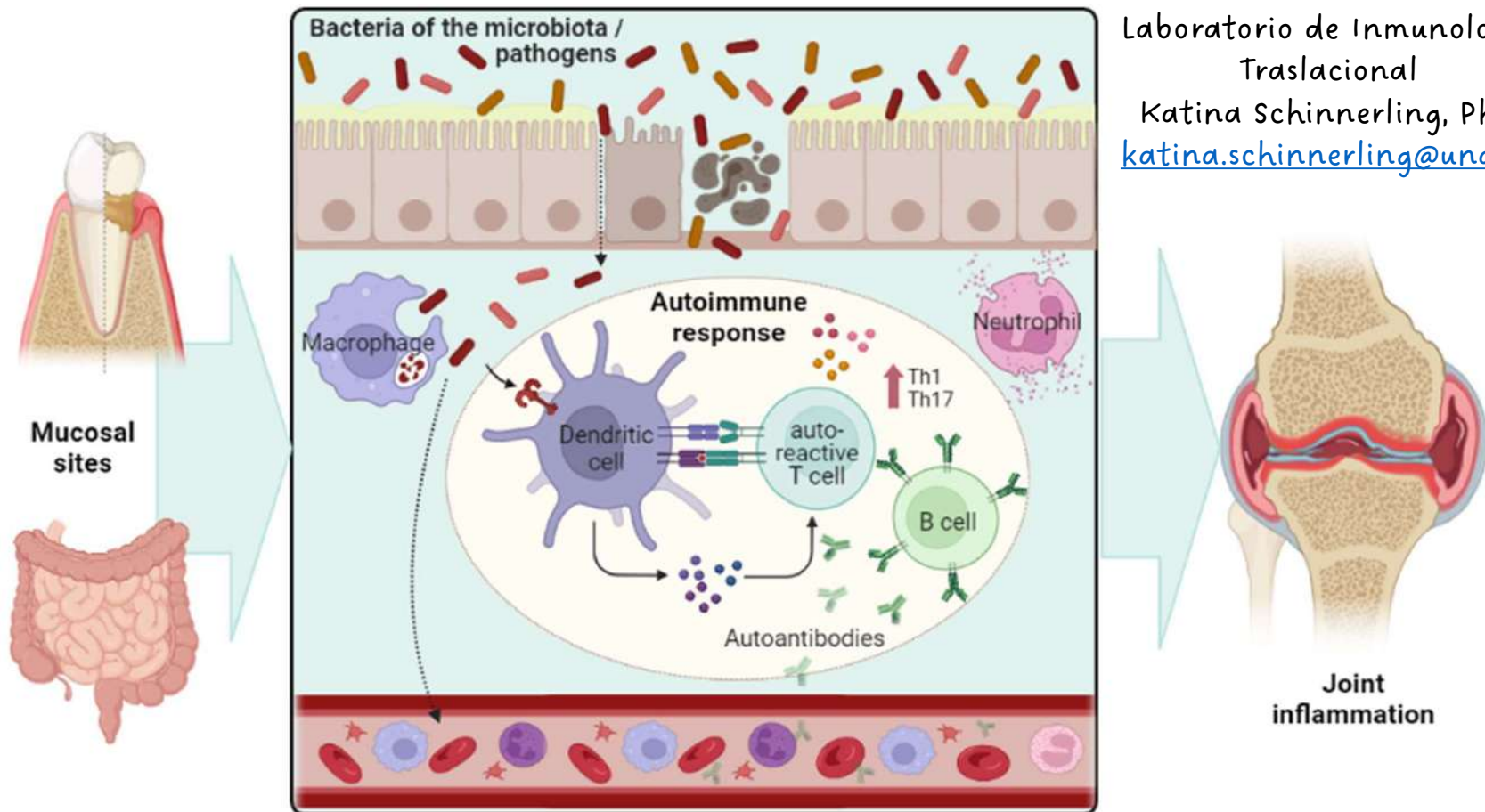
Also we work on the study of other plant cell wall as "Chilean papaya", Blueberries and flax seed mucilage.



Skills developed in our team:
Biochemical, molecular biology, cytology



We are studying the role of oral and gut bacteria in the development and shaping of autoimmune joint inflammation in Rheumatoid Arthritis

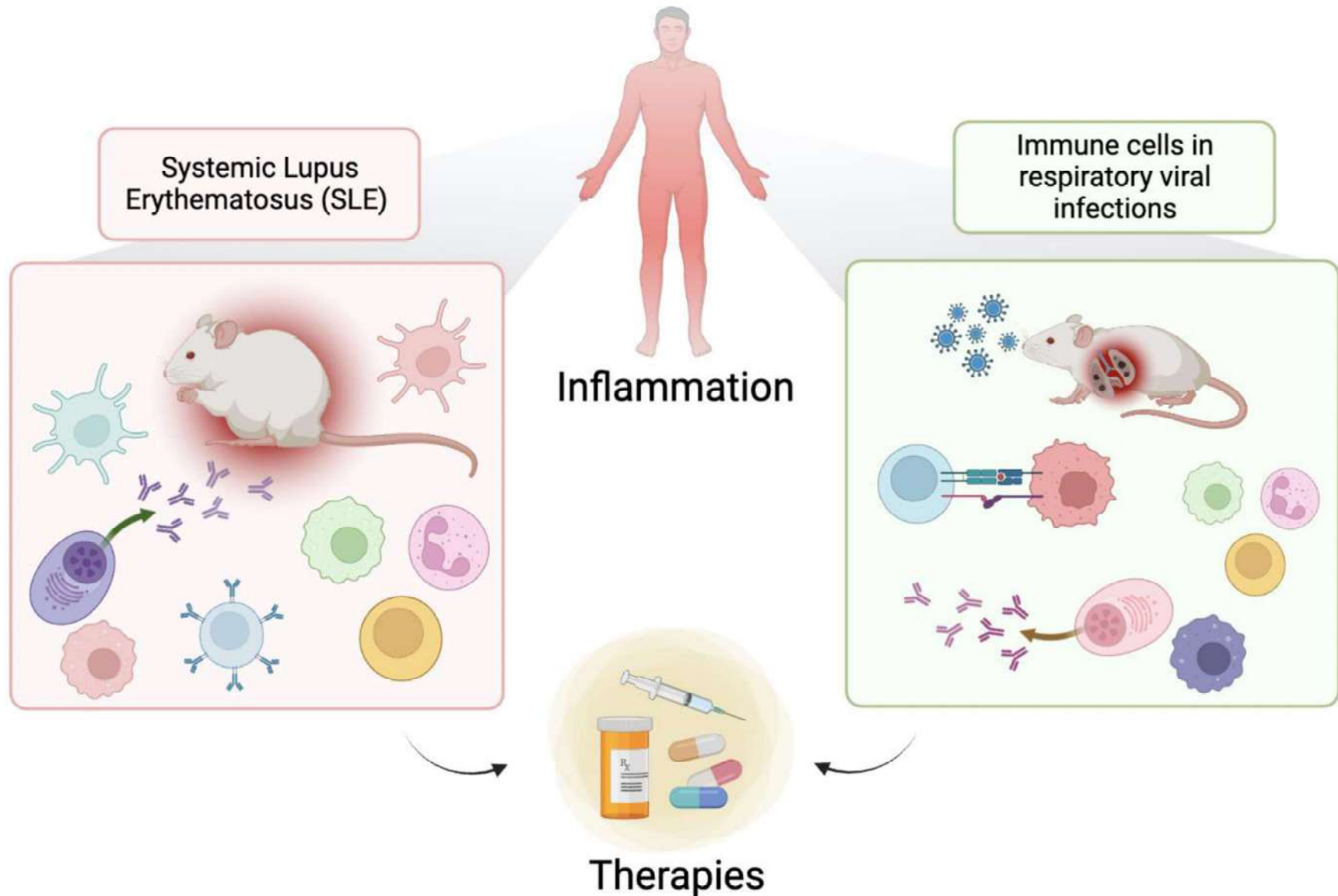


Laboratorio de Inmunología
Traslacional
Katina Schinnerling, PhD
katina.schinnerling@unab.cl

Translational Immunology Laboratory

Dr. Jorge Soto

Our objective is to identify the role of the immune system during inflammatory processes for identifying future therapeutic targets.



Identify the dysfunctional brain circuitry associated to psychiatric disorders

Characterize the molecular mechanisms associated with brain physiology and pathology

Find novel pharmacological targets for the treatment of psychiatric disorders

Design novel drugs and approaches to treat psychiatric disorders

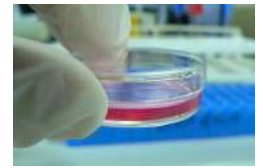
Neurobiology lab

Dr. Jimmy Stehberg

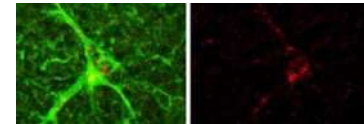
Cellular and molecular mechanisms associated with psychiatric disorders and memory



Psychiatric disorders and memory



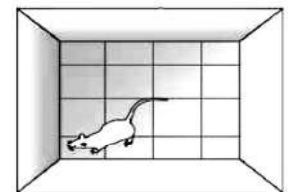
In vitro



Ex vivo



In vivo pharmacology



Behavior



Clinical

Laboratory of Neuroepigenetics

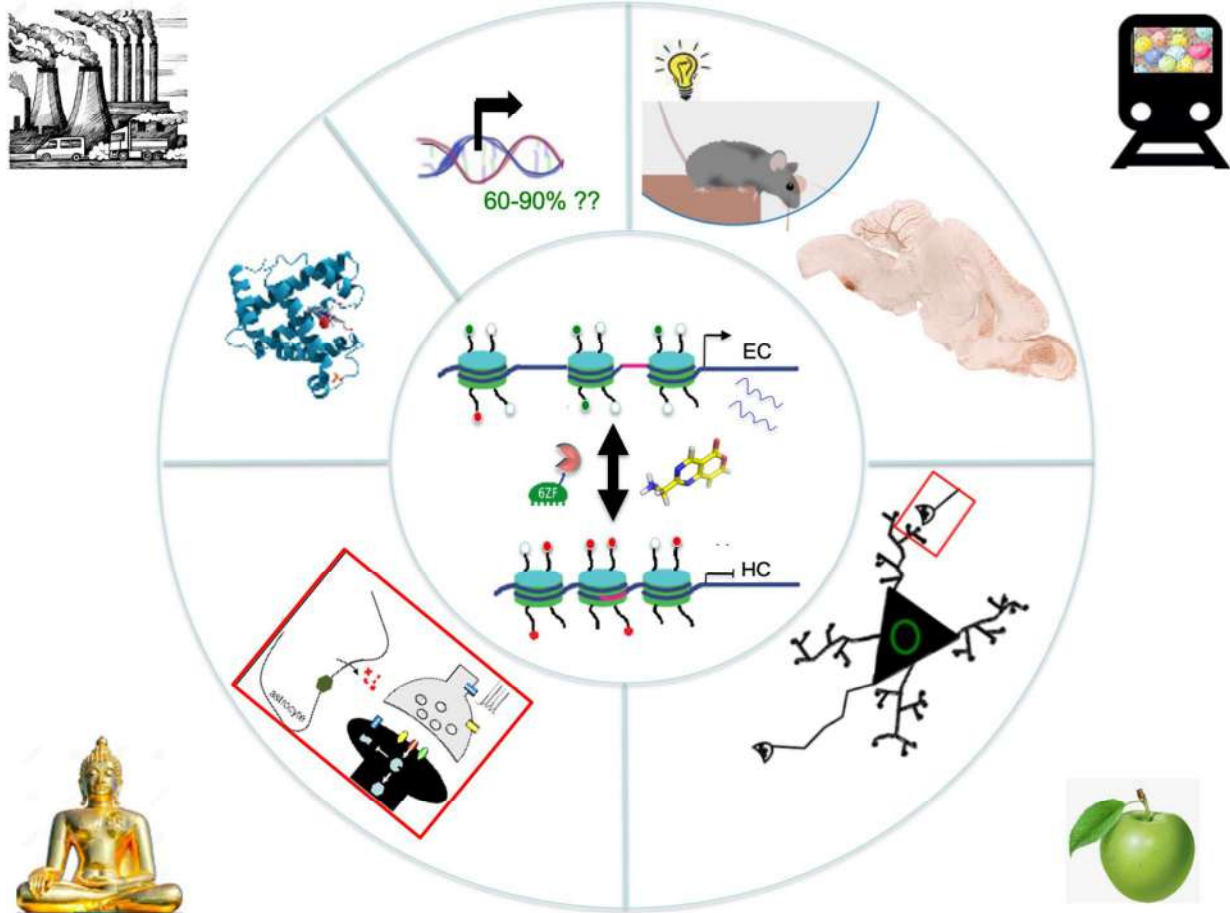
Dra. Brigitte van Zundert

Our line of investigation:

Studying the mechanisms underlying brain plasticity and neuroepigenetics in health (learning & memory) and in disease (amyotrophic lateral sclerosis, frontotemporal dementia, Alzheimer's disease and Huntington's disease); role of genetic factors and external factors (i.e. urban air pollution).

Our mission:

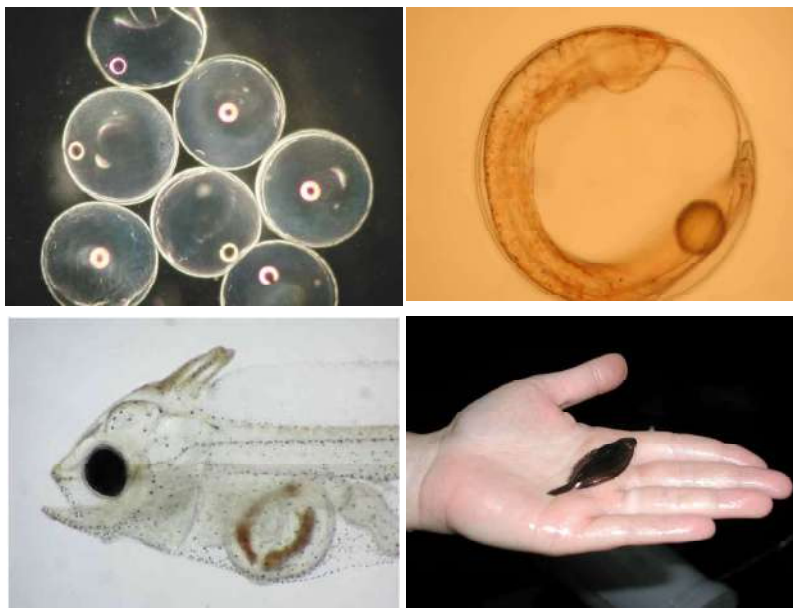
We believe that the acquired knowledge will open avenues for developing effective diagnostic and therapeutic approaches to slow the progression and, more optimistically, to prevent, halt, or even revert the effects of these devastating neurodegenerative diseases.



Laboratorio de Biotecnología Molecular

Dr. Juan Antonio Valdés

Optimizing the farming of Chilean flounder
using biotechnological tools



We aim at the use of molecular and biotechnological tools to solve contingent problems in national aquaculture



Investigative Report

Until the last hope: **THE ISA VIRUS, SALMON FARMING AND PATAGONIA**

Hasta la última esperanza:
EL VIRUS ISA, LOS SALMONEROS Y LA PATAGONIA

At least 70 percent of the Chilean salmon industry is found in the Los Lagos region, but due to the contamination its left behind, companies are migrating further south into Patagonia.

Al menos, 70% de la industria salmonera opera en la región de Los Lagos, pero debido a la alta contaminación en ríos y mares que ha dejado su producción, las empresas están migrando progresivamente hacia los mares australes.

By HECTOR KOL, Photos by FRANCISCO MEDIONI

Chile salmon farms lose 23 million fish due to toxic algae bloom



The economic cost of sea lice to the Chilean salmonid farming industry



Aquaculture
Diversification: CIMARO



Laboratory of Cellular and Molecular Neurobiology

Dr. Lorena Varela-Nallar

We aim to understand the signaling mechanisms controlling neurogenesis in the adult hippocampus, and to stimulate this process in models of Alzheimer's disease to improve cognitive function

