



Red de investigadores  
chilenos en los Países Bajos



# Scientific contributions to the development of Chile

## 2nd Conference IN.NL

February 16<sup>th</sup>, 2018  
Wageningen, The Netherlands

IN.NL - Network of Chilean Researchers in the Netherlands  
2nd Conference IN.NL: 'Scientific contributions to the development of Chile'

IN.NL - Red de Investigadores Chilenos en los Países Bajos  
2do Encuentro anual IN.NL: 'Contribuciones científicas para el desarrollo de Chile'

## **2nd Conference IN.NL: 'Scientific contributions to the development of Chile'**

This booklet is based on the results from the 2nd Conference IN.NL, held on February 16th, 2018 in the Orion Building of Wageningen University, Wageningen, The Netherlands.

IN.NL (Network of Chilean Researchers in the Netherlands) is a platform for dissemination and collaboration among Chileans involved in research, innovation and development, residing in the Netherlands.

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#### **Acknowledgements**

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Red de investigadores  
chilenos en los Países Bajos



Embajada de Chile  
en Países Bajos

## 2nd Conference IN.NL: 'Scientific contributions to the development of Chile'

## 2do Encuentro IN.NL: 'Contribuciones científicas para el desarrollo de Chile'

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IN.NL - Red de Investigadores Chilenos en los Países Bajos

Wageningen, The Netherlands.  
February 16th, 2018

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# Introduction



The Network of Chilean Researchers in the Netherlands (IN.NL) is a platform for dissemination and collaboration for Chileans involved in research, innovation and development, residing in the Netherlands. Hence, encouraging the exchange of knowledge, experiences and information among Chilean researchers and students is one of its main objectives.

This booklet presents the results of the second IN.NL Conference held in Wageningen in February, 2018. The event titled: Scientific Contributions to the Development of Chile, had the purpose of presenting and discussing the work that is being done by the members of this network. On this second occasion, the conference was focused on the current research production that contributes to achieving a more sustainable, equal and developed country. For the first time the conference was opened to the academic and scientific community of the University of Wageningen, promoting the debate between Chilean and international researchers.

The conference was structured around four thematic tracks: (i) Technology and health; (ii) Education, communication and society; (iii) Plant, animal and food sciences; and (iv) Social and environmental sustainability. After these parallel sessions, the event counted with the participation of renowned key-note speakers from Wageningen and from Leiden University. They shared their experience as Dutch and Chilean researchers working in topics in which both contexts converge. The event finalises with an open reflection regarding the challenges of the scientific contribution to the development of Chile. The discussion focused on the role of researchers and researcher networks in terms of technological development and innovation, the communication of scientific achievements, and influence in the public agenda.

La red de Investigadores Chilenos en los Países Bajos (IN.NL), es una plataforma de difusión y colaboración para chilenos involucrados en investigación, innovación y desarrollo, residentes de los Países Bajos. Entre sus principales objetivos se encuentra el fomentar el intercambio de conocimiento, experiencias e información entre investigadores y estudiantes chilenos en Holanda.

Esta publicación presenta el resultado de la segunda Conferencia IN.NL, llevada a cabo en Wageningen en Febrero del 2017. El evento titulado: Contribuciones científicas al Desarrollo de Chile, tenía por objetivo presentar y discutir el trabajo que ha sido realizado por los miembros de la red. En esta segunda ocasión, la conferencia se enfocó en la investigación que contribuye a alcanzar un país más sostenible, igualitario y desarrollado. Por primera vez, la conferencia fue abierta a la comunidad académica y científica de la Universidad de Wageningen, promoviendo el debate entre investigadores chilenos e internacionales.

La conferencia fue estructurada alrededor de cuatro áreas temáticas: (i) Tecnología y salud; (ii) Educación, comunicación y sociedad; (iii) Plantas, animales y ciencias de los alimentos; (iv) Sostenibilidad social y ambiental. Después de las sesiones paralelas, el evento contó con dos charlas magistrales de renombrados académicos de las universidades de Wageningen y Leiden. Ellos compartieron sus experiencias como investigadores Chilenos y Holandeses trabajando en temas en los que ambos contextos convergen. El evento finalizó con una reflexión abierta sobre los desafíos para la contribución científica en el desarrollo de Chile. La discusión se centró en el rol de los investigadores y las redes de investigación en términos de desarrollo tecnológico e innovación, comunicación de los resultados científicos e influencia en la agenda pública.



# 2<sup>nd</sup> Conference IN.NL



# Conference programme



13:00 Opening

13:05 Presentation IN.NL  
*Network of Chilean Researchers in the Netherlands*

13:20 Poster session  
*Ongoing research projects from IN.NL members*

14:30 Coffee Break

14:45 Oral presentations in parallel sessions:

- I. Technology and health
- II. Education, communication and society
- III. Plant, animal and food sciences
- IV. Social and environmental sustainability

15:50 Keynote speaker: Prof. Dr. Rutgerd Boelens  
*Political Ecology and the Question of Water Justice in Latin America*

16:05 Keynote speaker: Dr. Daniela Vicherat  
*Public spaces, walls and the paradoxes of citizenship*

16:20 Plenary session and discussion:  
*Scientific contributions for the development of Chile*

16:50 Closure

17:00 Drinks & Bites

# Keynote Speakers



## Rutgerd Boelens

Wageningen University - RUR



Rutgerd Boelens is Professor 'Political Ecology of Water in Latin America' holding a part-time special chair with CEDLA and the University of Amsterdam (Fac. Social and Behavioral Sciences FMG/GPIO and Fac. Humanities).

He also works as Professor Water Governance and Social Justice at Wageningen University (Environmental Sciences Group, Water Resources Management), and is Visiting Professor at the Catholic University of Peru and the Central University of Ecuador. He directs the international Justicia Hídrica /Water Justice alliance, engaged with comparative research and training on water accumulation, conflict and civil society action.

Dr. Boelens' research focuses on:

- Water rights
- Legal pluralism
- Cultural politics
- Political ecology

Rutgerd Boelens es Profesor de 'ecología política del agua en Latinoamérica' en una cátedra especial conjunta entre CEDLA y la Universidad de Ámsterdam (Facultad de Ciencias Sociales y Conductuales, y Facultad de Humanidades).

Trabaja también como profesor en Gobernabilidad del agua y justicia social en la Universidad de Wageningen y es profesor visitante en la Universidad Católica de Perú y en la universidad central de Ecuador. El dirige la alianza internacional de Justicia Hídrica, la que trabaja con investigación comparativa y entrenamiento en acumulación de agua, conflicto y acciones cívico-sociales.

La investigación del Dr. Boelens se enfoca en:

- Derechos de agua
- Pluralismo legal
- Política cultural
- Ecología política

## Keynote speakers

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**Daniela Vicherat**  
Leiden University College

Daniela Vicherat is Assistant Professor of Sociology at Leiden University College The Hague. She is originally trained academically and professionally as a sociologist in Chile, Daniela completed her PhD at the European University Institute with a thesis focused on the role of public spaces as social underpinnings of democracy. In 2008, she took up a Marie-Curie postdoctoral fellowship at the University of Edinburgh to carry out a research on another quiet prevalent urban form, walls, and the way in which they have been shaping European cities until nowadays.

Since 2010 she is working at LUC The Hague, where she convene the Gender Minor and the Global Challenges Diversity course. Daniela is specially interested in the uses of theory in everyday life and how large socio-political processes, such as democratization or migration, affect and shape public spaces in contemporary cities in Europe and Latin America. Her research focuses on the processes of border-making in conceptual terms, but also related to the visible manifestations of identity politics and the challenges of belonging. Ultimately, her interest is focused on to understand how these processes manifest in the urban landscape affecting our daily lives.

Daniela's research aims on topics such as:

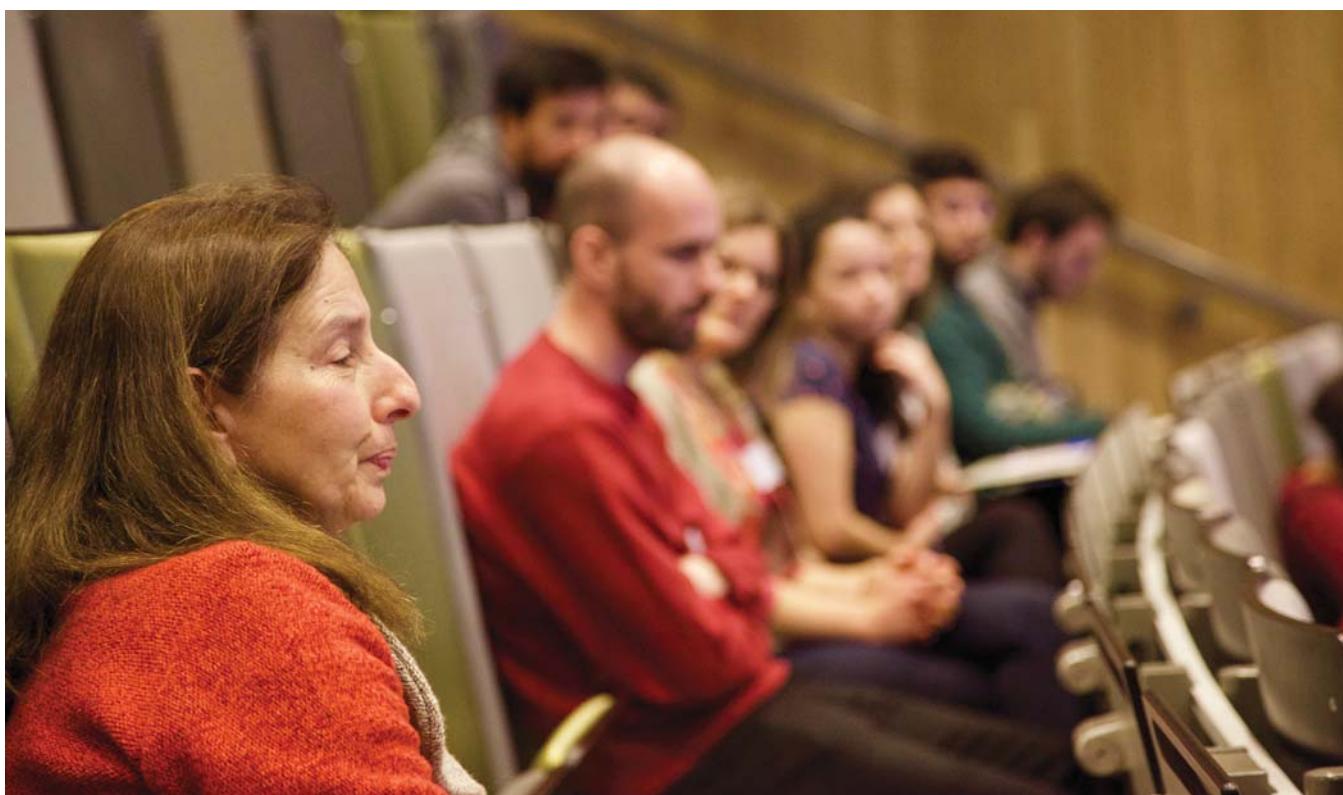
- Public Spaces.
- Identity/belonging.
- Vulnerability/care.
- Border-making.

Daniela es Profesora Asistente de Sociología en Leiden University College (LUC), en La Haya, Países Bajos. Con formación académica y profesional en sociología en Chile, Daniela completó su doctorado en el European University Institute con una tesis enfocada en el rol del espacio público como soporte social a la democracia. En 2008, ella optó por una beca de investigación postdoctoral Marie-Curie en la Universidad de Edimburgo, Escocia, para llevar a cabo una investigación sobre muros - otra de las formas urbanas predominantes – y la manera en que han estado dando forma a las ciudades Europeas hasta la actualidad.

Desde 2010 ella trabaja en LUC, en donde ha organizado un Minor sobre Género y el curso Global Challenges Diversity. Daniela está especialmente interesada en el uso de la teoría en la vida cotidiana, y como procesos socio-políticos de gran escala, como la democratización o la migración, afectan y moldean los espacios públicos en ciudades contemporáneas de Europa y América Latina. Su investigación se enfoca en los procesos de creación de fronteras en términos conceptuales, pero también relacionados a las manifestaciones visibles de políticas de identidad y los desafíos de pertenencia. Finalmente, sus intereses buscan entender como estos procesos se manifiestan en el paisaje urbano, afectando nuestra vida cotidiana.

Su investigación abarca temas como:

- Espacios públicos
- Identidad/pertenencia
- Vulnerabilidad
- Construcción de fronteras.



# IN.NL Structure & dissemination





IN.NL is defined as a platform for dissemination and collaboration for Chileans involved in research, innovation and development between Chile and the Netherlands. It is understood as a network of permanent contacts based in the Netherlands, without any political ideology, and as a tool for dissemination and scientific collaboration among agents linked to research and development from both countries. As agents, we consider academics, master students, PhD researchers, entrepreneurs and professionals with common interests around research, innovation and scientific development in several fields.

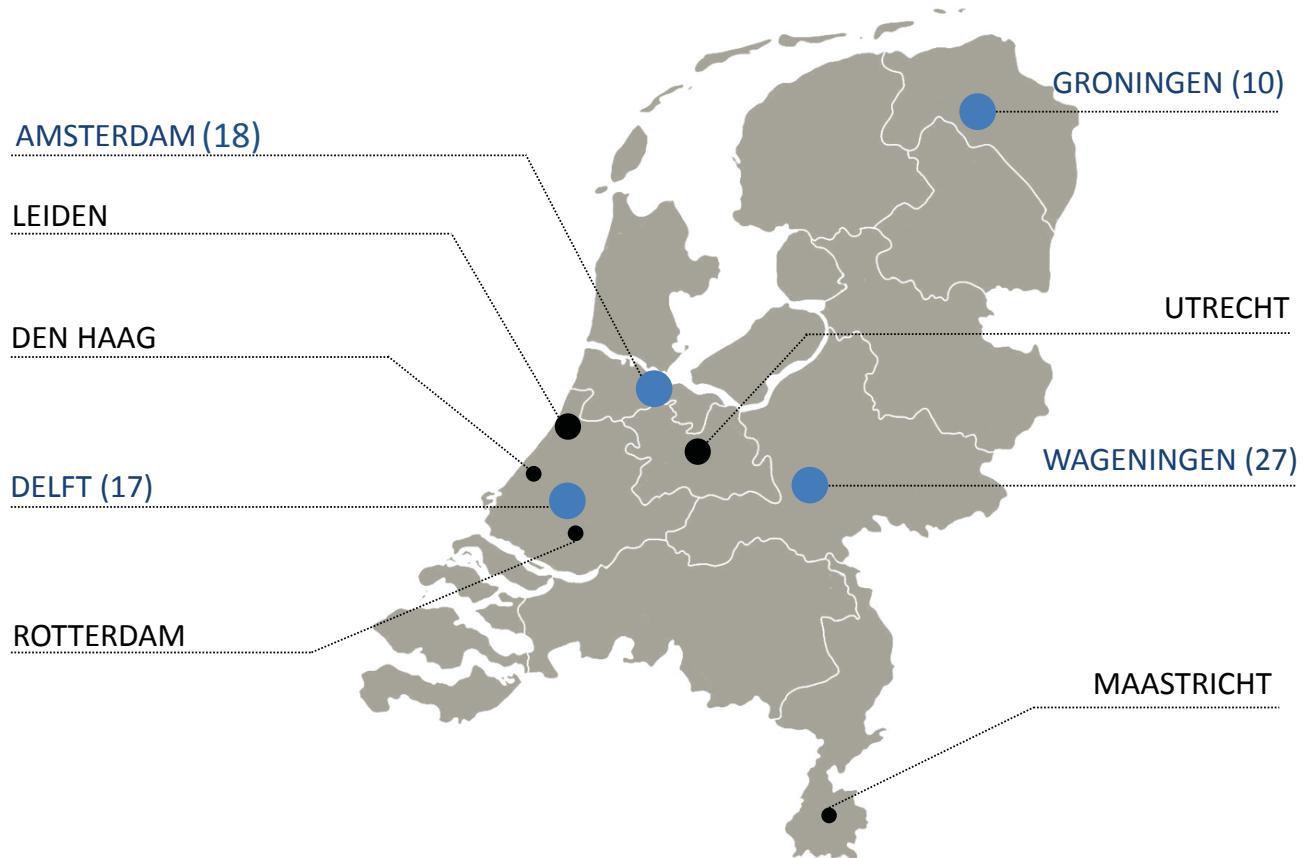
The organisational structure of the network during its forming period has followed a horizontal model based on a board, in which each active zone within the country is duly represented. The board itself is structured around two concentric circles, with a General Coordination in the centre, in charge of monitoring the achievement of defined goals and overall functioning of the network.

The upper image shows the circles behind the Board, with members in charge during the period 2017-2018. On the one hand, the red circle shows the roles related to the coordination of general tasks of the network: logistics, finance, communication and partnerships. On the other hand, the blue circle shows the coordinators of all active zones of the country (Amsterdam, Groningen, Wageningen and Delft). The representant of IN.NL in ReCh (Chilean Networks Association) is depicted separately, due to the specificity of the task. However, it is probable that similar roles appear in the near future, assuming that IN.NL establishes alliances with other organisations as such.

IN.NL se define como una plataforma de difusión y colaboración para chilenos involucrados en investigación, innovación y desarrollo entre Chile y los Países Bajos. La plataforma se entiende como una red de contactos permanentes con base en los Países Bajos independiente de cualquier ideología política y una herramienta para la difusión y colaboración científica entre agentes vinculados a la investigación y desarrollo en ambos países. Bajo la definición de agentes, se consideran académicos, estudiantes de magíster y doctorado, emprendedores, empresarios y profesionales cuyos intereses estén vinculados a la investigación, innovación y desarrollo científico en diversas áreas temáticas.

La estructura organizacional de la red durante su proceso fundacional ha seguido un modelo horizontal basado en un directorio en que se asegura la representación de cada zona actualmente activa. El directorio a su vez, se estructura a partir de dos anillos concéntricos, con una coordinación general a la cabeza, a cargo de velar por el cumplimiento de las metas y el funcionamiento general.

La imagen superior muestra los círculos que componen el directorio, con los miembros a cargo durante el periodo 2017-2018. En rojo se encuentran los cargos dedicados a la coordinación de tareas generales de la Red: logística, finanzas, difusión y extensión. Por otro lado, en azul se encuentran los representantes por cada zona activa en el país. La representación de IN.NL en ReCh (Redes Chilenas) esta aparte, dado su carácter puntual. Sin embargo, es probable que cargos similares aparezcan en el futuro, en el caso que IN.NL establezca alianzas con otras organizaciones, generando otro circulo en la estructura interna.



At territorial level, the network is organised in zones associated to main Dutch cities where we have found participating interest from the local Chilean scientific community. At the date of the Conference, IN.NL has 72 active members distributed in four zones: Amsterdam, Wageningen, Delft and Groningen. These zones have consolidated as active groups where their members meet periodically and organise their own activities. In turn, the members of each zone are represented in the IN.NL Board through their coordinators.

There are other identified zones such as Maastricht, Rotterdam, Leiden, The Hague and Utrecht, where although they are not fully consolidated as such, local Chilean researchers have expressed interest of being part of the network and involve actively. In the future, and according to further demand for it, it is within the expected that each one of these cities consolidates itself as a fully active zone with representation in the board. It is within the spirit of the network to promote self-organisation of the zones according to local interest from the professionals, researchers, academics and students that reside in them.

During 2017, IN.NL has focused on promoting and supporting activities developed by members of the network. We highlight the symposium 'Chilean Architecture. A critical review in the international context' held in the Faculty of Architecture at Delft University of Technology at October, 2017. In the symposium participated the Chilean architects Cristian Borja-Huidobro and Fernando Montes, both with

A nivel territorial, la red se encuentra organizada en zonas asociadas a ciudades en las que se ha identificado interés de participar por parte de la comunidad científica chilena residente. A la fecha del Encuentro la red está compuesta por 72 miembros activos distribuidos en cuatro zonas: Amsterdam, Wageningen, Delft y Groningen. Estas zonas se han consolidado como grupos activos en los cuales sus integrantes se reúnen periódicamente y organizan sus propias actividades. A su vez, los integrantes de cada zona son representados en la directiva a través de sus coordinadores.

Existen también otras zonas como Maastricht, Rotterdam, Leiden, La Haya y Utrecht en que si bien no están consolidadas como tal, investigadores residentes en esas áreas han mostrado el interés de ser parte de la red e involucrarse más activamente. En el futuro y en la medida que exista la demanda, se espera que cada una de estas ciudades se consolide también como zona con representación en la directiva. El espíritu de la red es incentivar la auto organización de las zonas de acuerdo a los interés de los profesionales, investigadores, académicos y estudiantes que las componen.

Durante el año 2017, IN.NL se ha enfocado en la difusión y/o apoyo a actividades desarrolladas por integrantes de la Red. Dentro de las actividades destacamos el simposio 'Chilean Architecture. A critical review in the international context' realizado en la Facultad de Arquitectura de la Universidad Tecnológica de Delft en octubre. El simposio contó con la participación de los arquitectos chilenos



relevant national and international experience. The initiative was organised by the Chilean Embassy in The Netherlands, ProChile, TU Delft, and IN.NL.

Another activity was the Webinar Symposium in Sustainable Development and Energy, held in Santiago, Chile and Colonia, Germany simultaneously. The activity was carried out in November, 2017 sponsored by Chile Global, and it was organised by the Network of Chilean researchers in Germany (Red INVECA) in collaboration with IN.NL and the Master in Sustainable Architecture and Energy (MASE) of PUC-Chile. The symposium focused on the development and use of energy generation technologies, energy efficiency and environment, as well as socio-political factors related to energy use and management.

In terms of promotion, IN.NL has supported the communication of different activities carried out by their members, promoting them in the social networks. Moreover, some of these activities have been published in national and international media. We highlight the interview with Dr. Darinka Czischke published in the special number devoted to the Netherlands in 'El Mercurio', and the promotion of the Seminar related to sustainability in transport policies where Dr. Alfredo Núñez participated.



#### ¿Quieres dar a conocer tu proyecto, tema de investigación o tesis?

En el encuentro tendremos un espacio para exhibir tu trabajo en formato poster. Si quieres participar descarga el formato en [www.facebook.com/RedInNL](http://www.facebook.com/RedInNL) y envia tu poster a [redchilena.innl@gmail.com](mailto:redchilena.innl@gmail.com) hasta el 3 de febrero, nosotros lo imprimimos.

Cristian Borja-Huidobro y Fernando Montes ambos con una reconocida trayectoria nacional e interanacional. La iniciativa fue organizada por la Embajada de Chile en los Países Bajos, ProChile, TU Delft y la Red IN.NL.

Otra de las actividades fue el simposio Webinar en Desarrollo Sustentable y Energía, realizado simultáneamente en Santiago, Chile y Colonia, Alemania. La actividad se llevó a cabo el 17 de Noviembre con el apoyo de Chile Global, y fue organizado por la Red de Investigadores Chilenos en Alemania (Red INVECA) en colaboración con IN.NL y el Magister en Arquitectura Sustentable y Energía (MASE) de la PUC-Chile. El simposio se concentró en el desarrollo y uso de tecnologías de generación de energía, eficiencia energética y medio ambiente, así como con aspectos socio-políticos relacionados con el uso de la energía.

En temas de difusión, la Red ha apoyado la comunicación de diversas actividades realizadas por sus integrantes, difundiéndolas en las redes sociales de IN.NL. Además, ha publicado actividades en medios de prensa nacionales e internacionales. Destacamos la entrevista a Dr. Darinka Czischke publicada en el suplemento especial dedicado a Holanda en El Mercurio, y la difusión del Seminario sustentabilidad en Chile en las políticas de transporte, en el cual participó el Dr. Alfredo Núñez.

# Oral presentations

# Session I

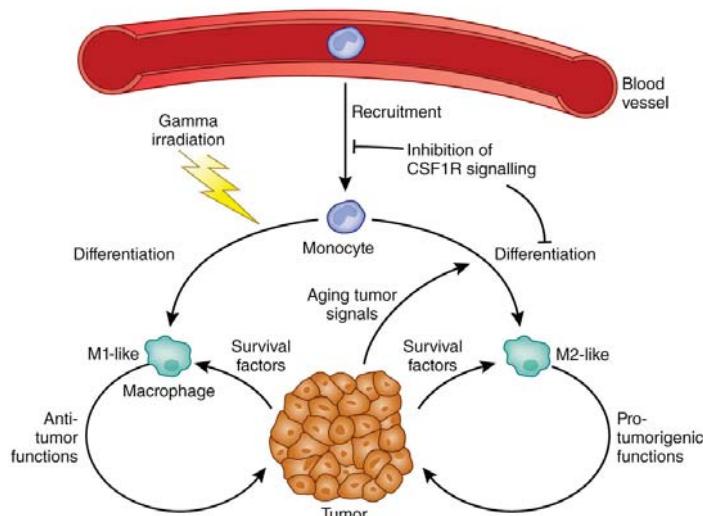
## Technology & health

Moderator: Mónica Lobato  
University of Groningen



# To enhance the efficacy of cancer immunotherapy by metabolic reprogramming tumour-associated immune suppressor cells

César Oyarce, Milena Vizcaino, Bhaarti Bodha & Toos Daemen  
UMCG, University of Groningen

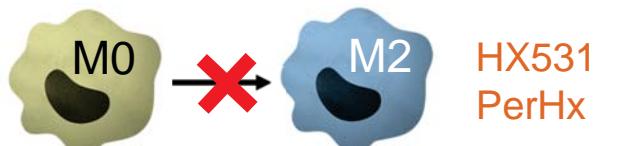


Cervical and ovarian cancer are still major causes of death. In both, high infiltration of immune suppressive M2-like macrophages is associated with poor prognosis. Therefore, these cells could be considered as targets for immunotherapy intervention. Since phenotype and activity of M2-macrophages is related to their metabolic profile, we are focused on the manipulation of the metabolic pathways to unleash and/or enhance their responsiveness to immunotherapy.

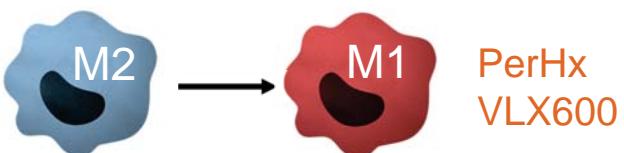
**Aim.** Select drugs that, by targeting metabolic pathways, can either prevent macrophages polarization into M2 phenotype or improve M2-to-M1 re-programming.

**Results.** We found that drugs CB839, AICAR, HX531 and Perhexilene prevent M2 polarization (Arg-1 expression). Moreover, HX531 and Perhexilene promote RE-polarization induced by IFN- $\gamma$ , which was also improved by Trimetazidine or VLX600. As expected, CB839, HX531 and Perhexilene increased glycolysis (M1 feature). On the other hand, VLX600 strongly suppresses maximal respiration (M1 feature). When macrophages cytotoxic activity was determined, CB839, HX531 and Perhexilene inhibited M2-induced tumor cell proliferation, showing that by affecting macrophages metabolism, their function can be skewed.

**Conclusion.** We showed that by altering macrophages metabolism its polarization can be prevented or re-programmed. This knowledge can help us to develop new treatments mean to that create a pro-inflammatory tumour environment that improves immunotherapy.



Inhibition of M2 polarization



Promotion of RE-programming

El cáncer cervical y de ovarios son aún las principales causas de muerte en mujeres. En ambos, la alta infiltración de macrófagos inmunosupresores tipo M2 se asocia con mala pronóstico. Por esto, los macrófagos tipo M2 pueden ser considerados como blancos terapéuticos para intervenciones de immunoterapia. Como el fenotipo y actividad de los macrófagos M2 está relacionado a su perfil metabólico, nos enfocamos en la manipulación de vías metabólicas para disminuir o aumentar su respuesta a inmunoterapias.

**Objetivos.** Seleccionar drogas que, al enfocarse en vías metabólicas, puedan prevenir la polarización de macrófagos al fenotipo M2 o re-programmar macrófagos de M2 a M1.

**Resultados.** Encontramos que las drogas CB839, AICAR, HX531 y Perhexilene previenen la polarización M2 (expresión de Arg-1). Ademas, HX531, Perhexilene, trimetazidina y VLX600 inducen re-polarización generada por IFN- $\gamma$ . Como esperábamos, CB839, HX531 y Perhexilene aumentaron la glicólisis (característica de M1). Por otro lado, VLX600 suprime fuertemente la respiración máxima (propia de M1). Al medir la actividad de los macrófagos sobre la proliferación de células tumorales, las drogas CB839, HX531 y Perhexilene inhibieron la capacidad de los macrófagos M2 para inducir la proliferación de células tumorales, mostrando que, al afectar el metabolismo de macrófagos, sus funciones también son alteradas.

**Conclusión.** Al alterar el metabolismo de macrófagos, su polarización puede ser prevenida o reprogramada. Este conocimiento puede ayudar a desarrollar nuevos tratamientos que generen un microambiente tumoral pro-inflamatorio que mejore el resultado de las inmunoterapias.

## PhD in Experimental Physics from University of Cologne, Germany

**Norma Hurtado**

NOVA Optical & Infrared Instrumentation Group at ASTRON Dwingeloo

I am a Chilean engineer and researcher with more than 20 years of experience in the Astronomy field, I work in an area known now as Astro-Engineering. I will start presenting my educational background and continue with my working experience from telescope and instruments operations in La Silla and Paranal observatories to the development of instrumentation for existing and future observatories in Chile.

12 years ago, as I wanted to work on instrumentation development, I moved to France to complete a Master's Degree and then worked as Research Engineer in the Service d'Astrophysique (CEA-Saclay) and in the Institut d'Astrophysique Spatiale. I was member of the team developing ArTeMiS, a bolometer camera for the APEX telescope in Chile.

Thereafter, I relocated to Germany where I obtained a PhD in Experimental Physics from University of Cologne. My PhD work consisted in the development of the optics and the cryogenics for the 1.1 THz Heterodyne Array Receiver for APEX.

I will finish presenting my current work as System Engineer at NOVA, the lead institute developing METIS, one of the three first instruments for the Extremely Large Telescope (ELT). The ELT with its 39 m primary mirror, will be the largest optical telescope in the world. It is plan to be operational in 2024 in Cerro Armazones, Chile.

Soy una ingeniera Chilena e investigadora con más de 20 años de experiencia en el campo de la Astronomía, y actualmente trabajo en un área conocida como Astro-Ingeniería.

Hace 12 años, me interesé trabajar en el desarrollo instrumental, para lo cual me trasladé a Francia a completa mi master. Posteriormente trabajé como ingeniera investigadora en el Service d'Astrophysique (CEA-Saclay) y en el Institut d'Astrophysique Spatiale en el mismo país. Además Fui parte del equipo desarrollador de ArTeMiS, un bolómetro para el telescopio APEX en Chile.

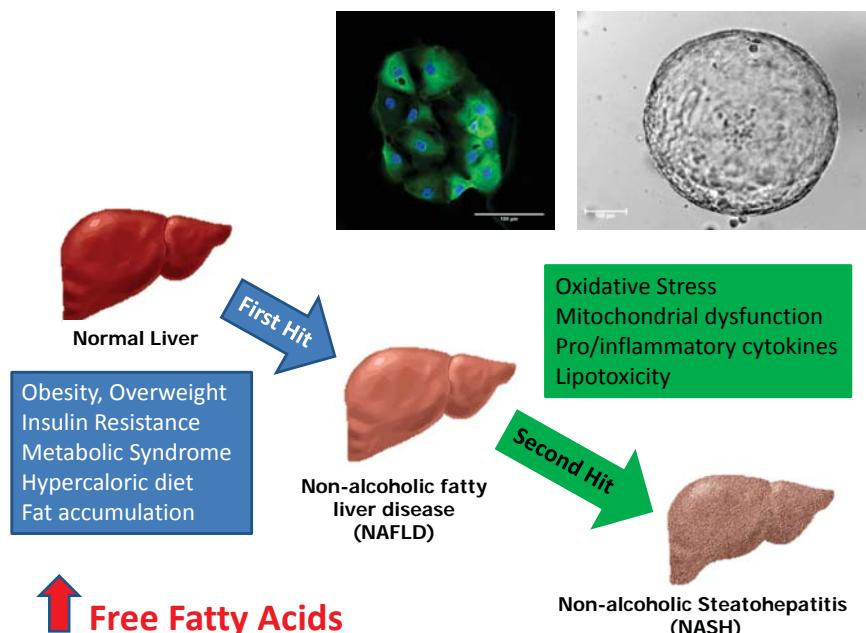
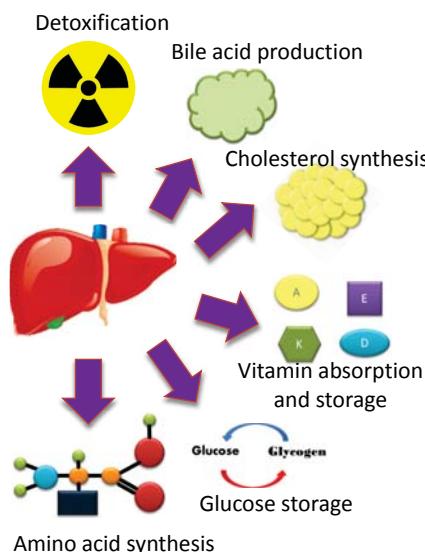
Unos años más tarde me trasladé nuevamente, esta vez a Alemania, en donde obtuve mi PhD en Física Experimental en la Universidad de Colonia. Mi investigación doctoral consistió en el desarrollo de óptica y criogenia para el 1.1 THz Heterodyne Array Receiver para APEX.

Actualmente trabajo como Ingeniera de Sistema en NOVA, el instituto líder en el desarrollo de METIS, uno de los tres primeros instrumentos para el Telescopio Extremadamente Grande (Extremely Large Telescope ELT). Con 39mm en su espejo primario, el ELT será el telescopio óptico más grande del mundo, y su puesta en marcha está planeada para el 2024 en el Cerro Armazones, Chile.

# Liver Organoids: Studying non-alcoholic fatty liver diseases

Natalia Smith, Hans Blojzil, Vincent Meijer, Klaas Nico Faber  
University of Groningen

## Liver Functions



The liver has many different functions like detoxification, production of proteins and metabolizing different nutrients. Most chronic liver diseases eventually progress to liver cirrhosis and its only available therapy is liver transplant. Studying liver diseases in the laboratory becomes problematic when trying to culture the specific liver cell types in vitro.

Although the liver is a highly regenerative organ the possibility of doing in vitro modeling of different liver diseases, like non-alcoholic liver diseases, is low since isolated liver cells have very low proliferation capacity in vitro. In the last few years the study of 3D cultured-stem cells have raised the opportunity for expanding and maintaining organoids in vitro which mimic some functions of the originating organ (lung, intestine, pancreas).

Here, we aim to use liver organoids to study hepatic diseases, in particular Non-Alcoholic Fatty Liver Disease (NAFLD) and the progression to Non-Alcoholic Steatohepatitis (NASH). Our primary research questions are what is the regenerative and differentiation capacity of liver organoids from NAFLD/NASH livers in comparison to those from "healthy" controls and if we can model NAFLD/NASH using liver organoids. Our goal is to further improve the models for studying liver diseases in vitro and find new therapies to treat liver diseases.

El hígado cumple muchas funciones como detoxificación, producción de proteínas y metabolización de diferentes nutrientes. La mayoría de las enfermedades hepáticas crónicas progresan a cirrosis hepática y el único tratamiento disponible es el trasplante de hígado. Estudiar estas enfermedades en el laboratorio se vuelve problemático dada la alta dificultad de cultivar los distintos tipos celulares del hígado.

A pesar de que este órgano es altamente regenerativo, la posibilidad de estudiar las distintas enfermedades en el laboratorio, como hígado graso no alcohólico o esteatosis hepática, es baja debido a la poca capacidad de proliferación de hepatocitos (células hepáticas) aislados. En los últimos años, el estudio de células madre en cultivos 3D ha generado la oportunidad de expandir y mantener organoides (cultivo celular 3D de células madres tejido-específico) en el laboratorio, los cuales son capaces de imitar las funciones del órgano original (pulmón, intestino, páncreas, entre otros).

Nuestro objetivo es usar organoides hepáticos para estudiar la progresión del hígado graso no alcohólico a esteatosis hepática no alcohólica. Queremos investigar cuál es la capacidad de regeneración y diferenciación de organoides hepáticos derivados de tejido hepático enfermo en comparación con aquellos derivados de tejido hepático sano. Por otro lado, queremos investigar si podemos usar organoides para modelar estas enfermedades en el laboratorio.

# Oral presentations

# Session II

## Education, communication & society

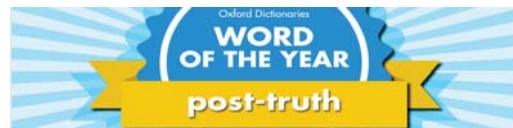
Moderator: Francisco Cerón  
University of Amsterdam



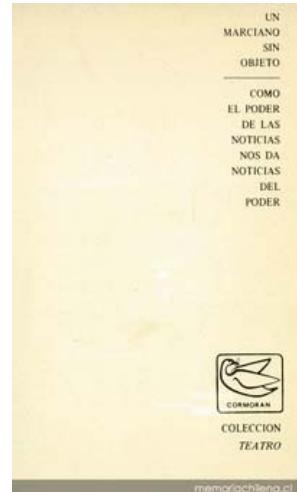
# José Ricardo Morales & his transnational theatre: The key concepts of communication, power and technology

Juan del Valle Rojas

University of Groningen



**José Ricardo Morales**  
Spanish-Chilean playwright  
Transnational Theatre



## How is the concept of Post-Truth articulated in Morales' piece of theatre *Como el poder de la noticias nos da noticias del poder* (1971)?

In recent years, society has been faced with several challenges concerning the advent of the Internet, nuclear technology, the commodification of the human being, etc. It can be found in several works within literature of the 20th Century. In this context, it is required to mention José Ricardo Morales 1915-2016, a Spanish-Chilean playwrights and writer on both sides of the Atlantic who contributed to the professionalization of theatre in Chile, and also established the Humanistic Theatre, in which he anticipated the several problems we are now facing in society: totalitarianism, globalization, and technology dependency.

Notwithstanding, his work has received little scholarly attention. This thesis will focus on: (1) a discussion on how Morales' possible worlds reflect the poetic capacity of his time to comment on the future, as well as a reflection on the predictive capacity of avant-garde aesthetics, as these, precisely because they break with existing paradigms and have more liberty to explore the unknown; (2) a discussion on the possibility of using Morales' projections for understanding the present and discussing such aspects as metafiction in the reflection on communication processes, and the recent context of globalization and political, cultural, and economic challenges.

En los últimos años, la sociedad se ha enfrentado a varios desafíos relacionados con el advenimiento de Internet, la tecnología nuclear, la mercantilización del ser humano, entre otros, representados en varias obras de la literatura del siglo XX. En este contexto, es necesario mencionar a José Ricardo Morales 1915-2016, un dramaturgo y escritor hispano-chileno cuya obra es conocida en ambos lados del Atlántico. Morales contribuyó a la profesionalización del teatro en Chile, y también estableció el Teatro Humanístico, en el que anticipó los diversos problemas que enfrentamos en la sociedad: totalitarismo, globalización y dependencia tecnológica.

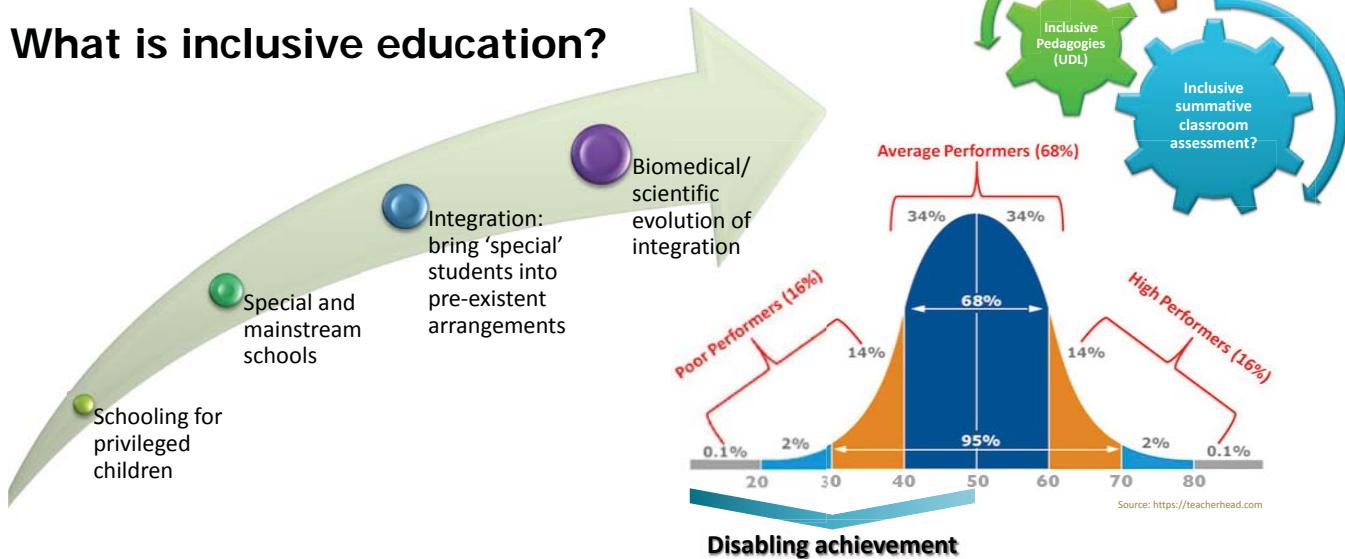
No obstante, su trabajo ha recibido poca atención académica. Esta tesis se centrará en: (1) una discusión sobre cómo los mundos posibles de Morales reflejan la capacidad poética de su tiempo para comentar sobre el futuro, así como una reflexión sobre la capacidad predictiva de la estética de vanguardia, precisamente porque rompen con los paradigmas existentes y tienen más libertad para explorar lo desconocido; (2) una discusión sobre la posibilidad de usar las proyecciones de Morales para entender el presente y discutir aspectos como la meta-ficción en la reflexión de los procesos de comunicación , el contexto reciente de la globalización y los desafíos políticos, culturales y económicos actuales.

# An exploration of summative classroom assessment at secondary schools in Chile from an inclusive perspective

Xaviera González-Wegener

UCL Institute of Education

## What is inclusive education?



Classroom assessment practice at secondary school level in Chile is currently facing tensions between the global paradigmatic shift for inclusive schooling and the national requirements for high-stakes grading. On the basis that inclusive education aims at enabling learning and achievement for all learners across the range of ability and disability, the aim of this research is to explore practitioners meaning-making practice under their contextualised challenges. I will explore the summative classroom assessment practice as how teachers enable valid and reliable achievement for all students through the following research questions: How do practitioners approach quality in summative classroom assessment?; Why do practitioners approach summative assessment under their perspective?; How do practitioners address learners differences and commonalities in classroom assessment?.

The data will be generated from observations and in-depth interviews, in order to get a better understanding of practitioners' views about the assessment practice and notions of inclusivity. The sample group will consist of four schools from the public and subsidised sector, in order to consider different notions about students' ability and assessment cultures. The results of this study will provide valuable insights that will inform knowledge by enabling bottom-up inclusive policy making, enlightening how and why current practices are taking place.

La práctica de evaluación en el aula a nivel de escuela secundaria en Chile enfrenta actualmente tensiones entre el cambio paradigmático global para la escolarización inclusiva y los requisitos nacionales para la calificación de promoción entre grados. Sobre la base de que la educación inclusiva tiene como objetivo permitir el aprendizaje y el logro para todos los estudiantes en todo el rango de capacidad y discapacidad, el objetivo de esta investigación es explorar la práctica de la construcción de significado que los profesores realizan en sus contextos de trabajo. Exploraré la práctica de la evaluación sumativa en aula, esto es, la forma en que los maestros permiten un rendimiento válido y confiable para todos los estudiantes. Las siguientes preguntas de investigación son las siguientes: ¿Cómo abordan los profesionales la calidad en la evaluación sumativa del aula?; ¿Por qué los profesionales abordan la evaluación sumativa?; ¿Cómo abordan los profesionales las diferencias y semejanzas de los alumnos en la evaluación del aula?

Los datos se generarán a partir de observaciones y entrevistas en profundidad, con el fin de obtener una mejor comprensión de las opiniones de los profesionales sobre la práctica de evaluación y las nociones de inclusión. El grupo de muestra consistirá de cuatro escuelas del sector público y subsidiado, a fin de considerar diferentes nociones sobre la capacidad de los estudiantes y las culturas de evaluación. Los resultados de este estudio permitirán informar la formulación de políticas inclusivas desde los contextos educacionales ilustrando el cómo y por qué las prácticas actuales se llevan a cabo.

# Facebook groups and academic preparation for the PSU: The academic instrumental and emotional utility of social media for Chilean youth

Camina Rodríguez

Amsterdam School of Communication Research (ASCoR), University of Amsterdam



44 in depth interviews

Men (8)	Women (14)	Zone
1	3	North zone (4)
1	2	Centre (11)
4	4	
1	1	
		South zone (7)
	4	

In Chile, the University Selection Test (PSU, Prueba de Selección Universitaria), is a standardized annual national test which defines entrance to university. The PSU selection system is run on a 'higher score, first served' basis, with slots filled with decimal points differences, generating sharp cut-offs (Hastings, Neilson, & Zimmerman, 2013). This system, together with the inequalities in academic preparation in Chile, make succeeding in this test a difficult endeavour for Chilean students.

In a series of double-interviews (N=44), the present study first analyzed the uses & gratifications obtained by Chilean youngsters when participating in a closed Facebook group about taking the Chilean equivalent to the U.S's SATs, the Prueba de Selección Universitaria (PSU). In a second phase, a survey (N = 446) gauged both the emotional and instrumental utility of using diverse social media during the test taking phase of the PSU.

Results showed that online social networks were an important source to obtain emotional and instrumental support during the PSU. In general, youngsters received supportive replies to their social media posts (86.8%) and judged this feedback as supportive (70.50%). About the most used social media, Whatsapp topped the list (90%), followed by Facebook (60%) to request emotional and instrumental support during the test-taking days.

En Chile, la Prueba de Selección Universitaria (PSU), es una prueba anual estandarizada que define la entrada a la Universidad. El sistema de selección de la PSU está administrado sobre la base del puntaje más alto, con puestos siendo llenados con diferencias decimales en el puntaje, generando abruptos puntajes de corte (Hastings, Neilson, & Zimmerman, 2013). Este sistema, junto con las inequidades del sistema de preparación académica en Chile, hace que tener éxito en esta prueba sea una difícil tarea para los estudiantes chilenos.

En una serie de doble-entrevistas (N = 44), el presente estudio primero analizó los usos y las gratificaciones obtenidas por los jóvenes chilenos cuando participaron en un grupo cerrado de Facebook acerca de realizar la prueba. En una segunda etapa, una encuesta (N = 446) evaluó la utilidad emocional e instrumental de utilizar diversas redes sociales durante la fase de dar la prueba.

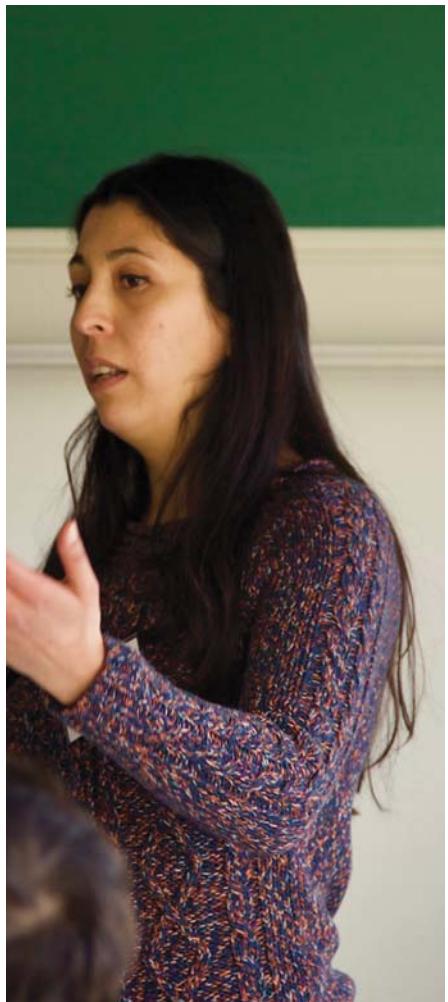
Los resultados mostraron que las redes sociales en línea fueron una importante fuente para obtener apoyo emocional y práctico durante la PSU. En general, los jóvenes recibieron apoyo en sus posteos en redes sociales (86.8%) y juzgaron a esta retroalimentación como satisfactoria (70.50%). En cuanto a redes más utilizadas, Whatsapp encabezó la lista (90%), seguida de Facebook (60%) para solicitar apoyo emocional e instrumental durante los días de dar la prueba.

# Oral presentations

# Session III

## Plant, animal and food sciences

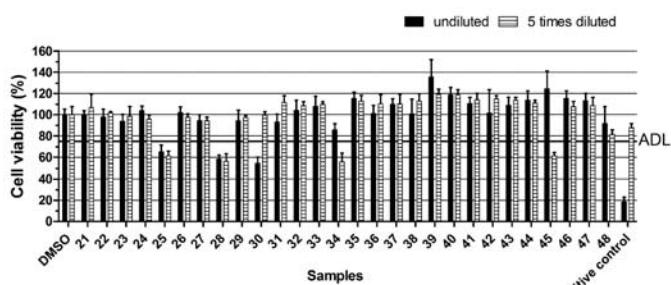
Moderator: Lucía Frez  
Wageningen University



# Detection of diarrheic shellfish poison using cell lines: Replacing animal testing in food safety

Marcia Bodero

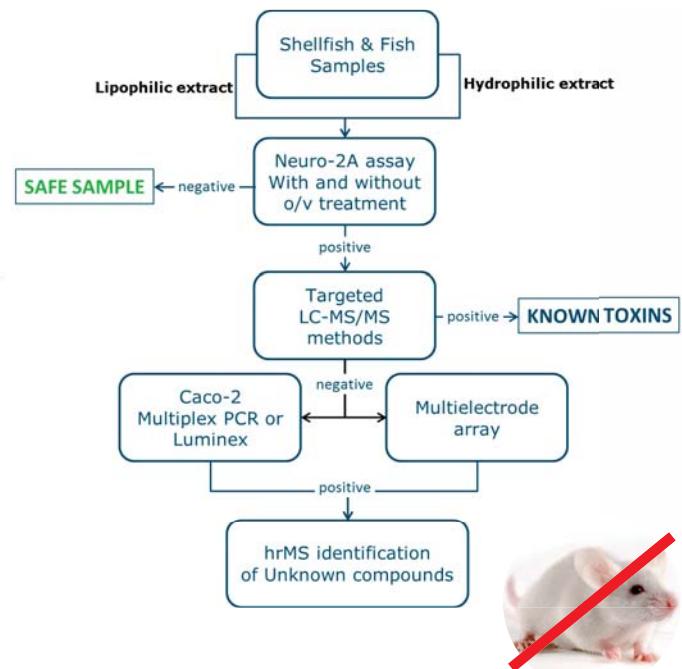
Wageningen University & Research



Toxin	Current EU regulation (SM: shellfish meat)
OA and analogues	160 µg OA equivalent/kg SM
PTX	160 µg OA equivalent/kg SM
AZAs analogues	160 µg AZA-1 equivalent/kg SM
YTXs analogues	3.75mg YTX equivalent/kg SM
STX	800 µg PSP / kg SM *90.000 in 2016!
DA	20 mg/DA/kg SM

The mouse bioassay (MBA) for the detection of marine biotoxins in seafood needs replacement. Like the MBA, an animal free alternative should detect both known and unknown toxins. Our new strategy combines cell-based bioassays with toxic effect measurements for screening and chemical analyses for confirmation and identification.

The Neuro-2a bioassay is used as the primary screening method. Samples scoring positive in the Neuro-2a assay are confirmed by LC-MS/MS analysis. In case a suspect screened sample cannot be confirmed by the presence of a known toxin, additional testing is needed. For this, we developed a second bioassay, based on gene expression analysis of exposed human intestine Caco-2 cells, i.e. measurements of mRNA responses of selected marker genes using a multiplex qPCR or a Luminex bead-based multiplex assay. These methods enable the identification of toxin-related profiles. If such a toxin profile is found, further identification is started by a bioassay-directed LC-ToFMS analysis.



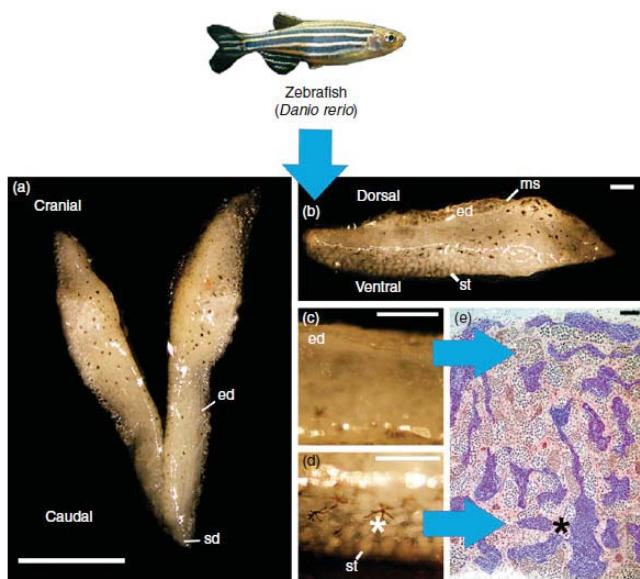
El bioensayo en ratón para la detección de toxinas marinas en mariscos necesita reemplazo. La alternativa debe ser capaz de detectar toxinas conocidas y desconocidas, o posibles nuevas toxinas. Nuestra nueva estrategia combina el uso de ensayos celulares que miden efectos tóxicos, con análisis químicos para confirmación y cuantificación.

Las células neuro-2a han sido usadas para la detección de veneno paralítico. En este trabajo demostramos que también pueden ser utilizados con toxinas lipofílicas. Nuestra estrategia propone que el ensayo con células neuro-2a es usado como 'screening' primario. Las muestras que sean positivas en este primer ensayo son confirmadas a través del análisis por LC-MS/MS. Si la muestra no puede ser confirmada por métodos de química analítica, otros análisis son requeridos. Para esto, una segunda línea celular podría ser utilizada. Este trabajo está en proceso y los resultados son aún confidenciales.

# Endocrine regulation of fish reproduction: New opportunities for Chilean aquaculture industry

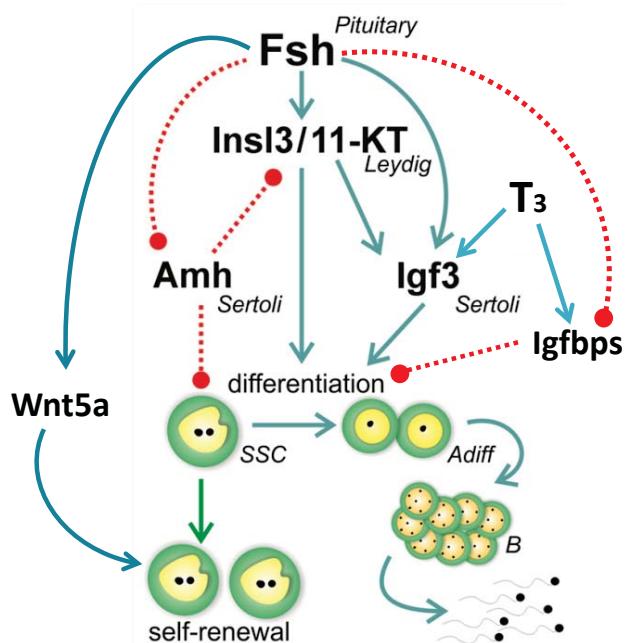
Diego Safian

Utrecht University



The increasing food demand and reduction of fishing stock have resulted in growing aquaculture production in the last years. In Chile, aquaculture has become one of the most important food industries; however, close to 90% of the total production consists of salmonids species. Therefore, the development of aquaculture system for other fish species is needed. The production of gametes (eggs and spermatozoa) is one of the key aspects to consider when introducing new species into aquaculture system and the endocrine system have evolved as the major regulator of these complex processes. The pituitary hormone Follicle-stimulating hormone (Fsh) regulates the activity of somatic cells in gonads, which then communicate with germ cells via short-range signaling. Nevertheless, the information available on the short-range communication systems involved in mediating Fsh effects is limited.

Using male zebrafish as a fish model, we discovered that Fsh stimulates both self-renewal and differentiation of spermatogonia (spermatozoa progenitor cells), a critical process to maintain testis tissue homeostasis throughout adult life. Here, we described that Fsh modulates the expression and production of Igf- and Wnt-related genes (among others), evolutionary conserved middle- and short-range signaling systems respectively, to encompass self-renewal and differentiation of spermatogonia.

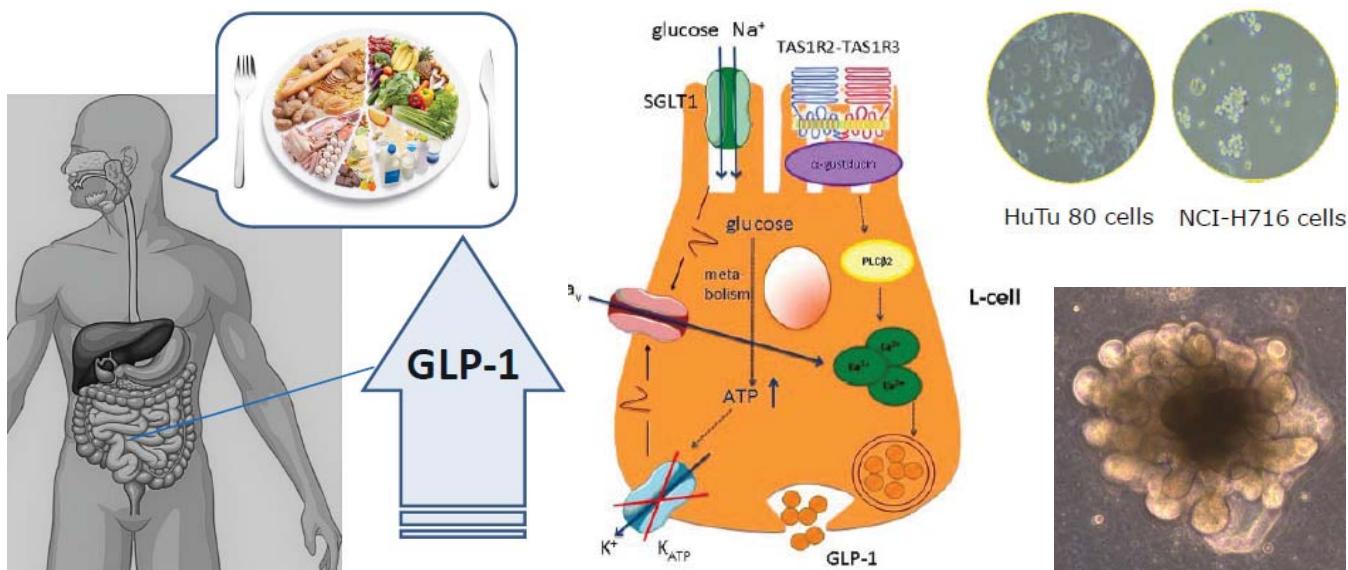


Debido a la creciente demanda por alimentos y a la reducción de los stock pesqueros, la producción acuícola ha crecido continuamente en los últimos años. En Chile, la acuicultura se ha transformado en uno de las industrias alimentarias más importantes; sin embargo, cerca del 90% de la producción total del país consiste en especies de salmones. Por lo tanto, el desarrollo de cultivos para nuevas especies de peces es indispensable para consolidar la industria en nuestro país. La producción de gametos viables (ovas y espermatozoides), uno de los aspectos claves para desarrollar el cultivo de nuevas especies, es un proceso controlado principalmente por el sistema endocrino. La hormona Folículo estimulante (Fsh) regula la actividad de las células somáticas en las gónadas (ovarios, testículos), quienes a su vez regulan las células germinales (oogonios y espermatogonias) mediante un sistema de señalización de corto alcance. Pese a la relevancia de Fsh como modulador de la gametogénesis, existe muy escasa información sobre que moléculas son reguladas por Fsh en la células somáticas y que ejercen finalmente un efecto directo sobre las células germinales.

Usando el pez cebra como una especie de pez modelo, encontramos que Fsh puede regular los factores de crecimiento Igf y Wnt, para así estimular la generación de nuevas espermatogonias y, también, estimular su diferenciación hacia espermatozoides.

# The role of bitter taste receptors in GLP-1 stimulation and Type-2 Diabetes

Francisca Noya  
Wageningen University & Research



GLP-1 is an intestinal hormone that is secreted after meal intake from enteroendocrine cells at the gastrointestinal (GI) tract. It regulates gastric emptying, satiety sensation, reduction of appetite and acts as a potent anti-hyperglycemic hormone that stimulates insulin secretion in a glucose-dependent manner. Nowadays, GLP-1-based strategies (mimetics or inhibitors of degradation) are employed in the treatment of Type-2 Diabetes due to its effectiveness in glycaemia control.

Taste receptors are, next to present on the tongue, also expressed in the GI tract. To the extent that nutrients are detected, some sweet/umami/fat active taste receptors can trigger GLP-1 secretion.

Lately, some bitter compounds have shown a GLP-1 stimulant effect in mice using in vitro- and in vivo-models. Bitter taste receptors in humans are a group of 29 members but in general, little is known about them. For this reason, the first approach of this study is a comprehensive review on the expression of bitter taste receptor family members along the GI tract. Next, the study will focus on the screening of bitter food-compounds that might have a contribution in GLP-1 secretion. Thereby, we expect to provide new perspectives in satiety and glycaemia control.

GLP-1 es una hormona intestinal secretada por células enteroendocrinas del tracto gastrointestinal (GI) tras la ingesta de alimentos. Regula el vaciado gástrico, la sensación de saciedad, la disminución del apetito y actúa como una potente hormona anti-hiperglucémica estimulando la secreción de insulina de manera dependiente de glucosa. Hoy en día, estrategias basadas en GLP-1 (miméticos o inhibidores de degradación) se emplean en el tratamiento de la Diabetes tipo 2.

Los receptores del gusto, presentes en las papilas gustativas de la lengua, también están expresados en el tracto GI. A medida que los nutrientes son detectados, receptores para dulzor, umami o ácidos grasos han mostrado desencadenar la secreción de GLP-1.

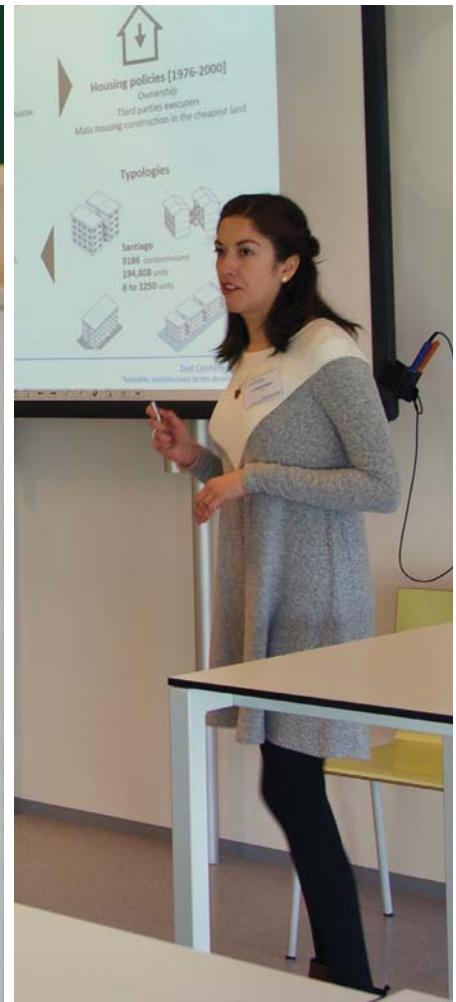
Últimamente, ciertos compuestos amargos también propician la secreción de la hormona GLP-1 en ratones, empleando modelos in vitro e in vivo. Los receptores de amargor (TAS2Rs) en humanos constituyen una familia de 29 miembros escasamente estudiada. La primera aproximación de este estudio corresponde a una revisión de la expresión de TAS2Rs a lo largo del tracto GI. Consiguientemente, el objetivo es la identificación de alimentos amargos que contribuyan a la secreción de GLP-1. De este modo, esperamos proporcionar nuevas perspectivas en el control de la saciedad y la glucemia.

# Oral presentations

# Session IV

## Social & environmental sustainability

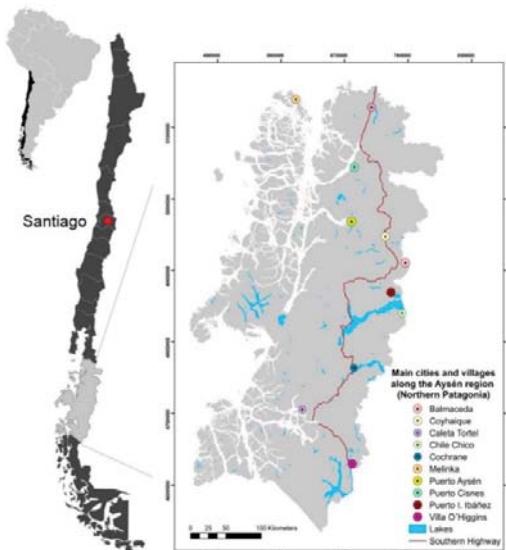
Moderator: Alejandro Prieto  
Delft University of Technology



# Environment and development: A discursive puzzle from the Aysén Region (Northern Patagonia, Chile)

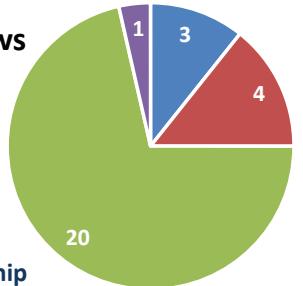
Pamela Bachmann-Vargas

Wageningen University & Research



## Data collection: 28 Semi-structured interviews

- Academy
- NGOs
- Public sector
- Tourism Public-Private partnership



Environment		Development			
Patagonian wilderness	The cultural and natural heritage	Regional demands	Nature as a resource I: Aquaculture	Nature as a resource II: Hydropower projects	Nature as a resource III: Nature-based tourism

In places with a predominantly natural heritage, environmental and development discourses are intertwined and often contested, entangling diverse social actors and their interests. In addition, such discourses influence the way ecosystems are governed. In this research, I address the regional perspectives on environment and development through the re-construction of environmental and development discourses. To do so, I define environmental discourses, as the shared set of ideas that convey an explicit concern about environment and nature protection, whereas development discourses are conceptualized around ideas that express an explicit meaning about economic growth, economic activities and/or life conditions. Although, these definitions may sound broad, the definition of environmental and development discourses represent a contested concept by itself. Discourses were re-constructed based on semi-structured interviews with key informants, complemented with observation method and secondary sources review.

Six discourses related to environment and development were distinguished. These discourses can be interpreted as pieces of a “discursive puzzle”, that coexist shaping the daily-life, the environmental governance, the policy-making and the regional development of the Aysén region. On a regional scale, the discursive puzzle is mainly composed of development pieces, reflecting external, more than local, influences.

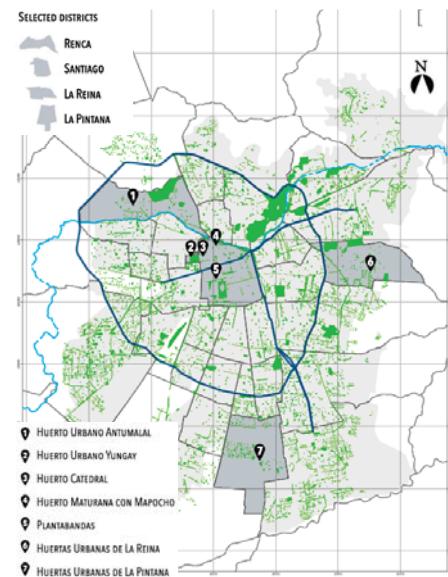
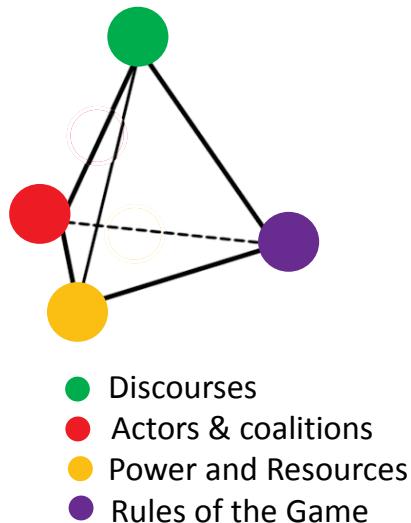
En lugares con un patrimonio predominantemente natural, los discursos acerca del medioambiente y del desarrollo están entrelazados y muchas veces en disputa, enredando diversos actores sociales y sus intereses. Además, estos discursos influencian la manera en que gobernamos ecosistemas. En esta investigación, se abordan las perspectivas regionales del medio ambiente y el desarrollo, a través de la reconstrucción de discursos del desarrollo y medioambientales. Para hacer ésto, los discursos medioambientales se definen como el conjunto compartido de ideas que verbalizan una preocupación explícita por el medio ambiente y la protección de la naturaleza. Por otro lado, discursos del desarrollo se conceptualizan alrededor de ideas que expresan un significado explícito acerca de actividades y crecimiento económico y/o condiciones de vida. Aunque estas definiciones puedan sonar amplias, la definición de discursos medioambientales y del desarrollo representa un concepto en disputa en sí mismo. Los discursos fueron reconstruidos a partir de entrevistas semi-estructuradas con informantes clave, y complementadas con observación y revisión de fuentes secundarias.

Seis discursos relacionados con medio ambiente y desarrollo fueron identificados. Estos discursos pueden ser interpretados como piezas de un “puzzle discursivo”, que coexiste, dando forma a la rutina diaria, gobernanza medioambiental, legislación, y el desarrollo regional de la Región de Aysén. En una escala regional, el puzzle discursivo está compuesto mayormente por piezas de desarrollo, reflejando influencias más externas que locales.

# Is urban agriculture urban green? A comparison of policy arrangements for urban green space and urban agriculture in Santiago de Chile

Maria Contesse, Bas van Vliet, Jennifer Lenhart

Wageningen University & Research



Urban green spaces are crucial for citizens' wellbeing. Nonetheless, many Latin American cities struggle to provide sufficient and equitable green space distribution for their citizens. By looking at the Chilean capital Santiago as an example, this paper examines whether the growing urban agriculture movement provides a feasible opportunity to increase public urban green space access. It does so by using the policy arrangement approach to analyse change and stability in two policy domains: urban green space planning and urban agriculture.

The paper investigates urban green spaces and urban agriculture and the role of practitioners, urban planners and policymakers. The analysis found opportunities for urban agriculture to facilitate the expansion of urban green spaces in Santiago if policy mechanisms enable private or public spaces to be maintained by citizen organizations. Such mechanisms may, however, encounter resistance from public agencies, as it is unresolved who is involved and who benefits from urban agriculture.

The paper concludes that urban agriculture is an opportunity for urban greening in Santiago, although changes are needed in how green areas are planned and conceived. Additionally, urban agriculture should not be understood as a substitute for parks but as a complementary form of green space provision with a distinctive value.

Las áreas verdes urbanas son cruciales para el bienestar de los ciudadanos. No obstante, muchas ciudades latinoamericanas presentan problemas en cuanto a la provisión de suficientes áreas verdes, distribuidas equitativamente, para sus ciudadanos. Al observar Santiago, la capital de Chile, como un ejemplo, este artículo examina si el movimiento creciente de agricultura urbana provee una oportunidad viable para incrementar el acceso público a áreas verdes urbanas. Esto se hace utilizando el PAA (*policy arrangement approach*) para analizar cambios y estabilidad en dos dominios normativos: planificación de áreas verdes urbanas, y agricultura urbana.

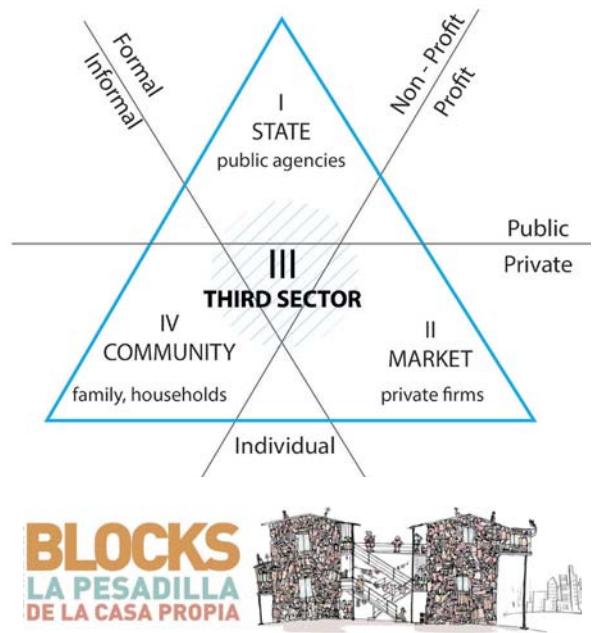
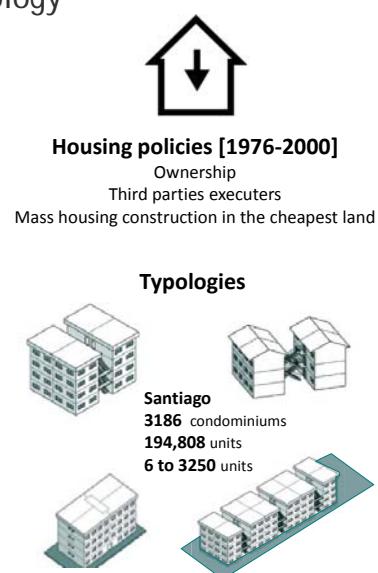
El artículo investiga áreas verdes urbanas y agricultura urbana, y el rol de profesionales, planificadores urbanos, y legisladores. El análisis encontró oportunidades en la agricultura urbana para facilitar la expansión de áreas verdes urbanas en Santiago, en el caso que mecanismos normativos permitan que organizaciones ciudadanas mantengan estas áreas privadas o públicas. Tales mecanismos podrían, sin embargo, encontrar resistencia de parte de agencias públicas, ya que no está resuelto quien está involucrado y quien se beneficia de la agricultura urbana.

El artículo concluye que la agricultura urbana es una oportunidad para generar áreas verdes urbanas en Santiago, aunque se necesita cambiar la manera en que se planifican y conciben áreas verdes. Adicionalmente, la agricultura urbana no debería ser entendida como un sustituto de parques, sino que como una manera complementaria de provisión de áreas verdes con un valor distintivo.

# Managing social condominiums: The role of third sector organizations in housing improvement and maintenance for Chilean low-income homeowners

Luz María Vergara

Delft University of Technology



In Chile, social condominiums are a significant part of the affordable owner-occupied housing stock. However, after decades of occupancy, this housing stock shows signs of rapid deterioration and devaluation due to neglected maintenance. Given the weak governmental support in management practices, third sector organisations are positioning themselves as alternatives to provide technical solutions and contributing to enhance opportunities and capacities among deprived communities. However, little is known about the dynamics between these organisations and the communities they work with, as well as their interactions with their institutional environment in the context of improving condominium management practices.

Employing concepts of intermediation and institutionalization, the presentation will discuss opportunities of socially innovative practices of Chilean housing institutions and actors regarding the improvement and management of social condominiums. The main focus will be the intermediary role of third sector organisations in supporting communities to improve the management of their properties. The main characteristic of current practices is a holistic approach to face complex interventions, situating the users at the centre of the process. Main challenges are related to the institutionalization: the inclusion of more incentives to scale-up and consolidate third sector as a relevant actor in housing and condominium management.

En Chile, los condominios sociales son parte significativa del stock de vivienda social en propiedad. Sin embargo, después de décadas de ocupación, este parque habitacional muestra signos de rápido deterioro y devaluación debido a descuido y falta de mantenimiento. Dado el débil apoyo gubernamental en materia de administración, organizaciones del tercer sector se están posisionando como una alternativa para proveer soluciones técnicas y contribuir a mejorar oportunidades y capacidades en comunidades desaventajadas. Sin embargo, se sabe poco respecto a las dinámicas entre estas organizaciones y las comunidades con las que trabajan, y de sus interacciones con su entorno institucional, en el contexto de mejorar prácticas de administración en condominios sociales.

Usando conceptos de intermediación e institucionalización, la presentación discute oportunidades para la implementación de prácticas socialmente innovadoras para la mejora y administración de condominios sociales, por parte de instituciones chilenas y actores vinculados a la vivienda. El foco estará puesto en el rol de intermediario de organizaciones del tercer sector, apoyando a las comunidades a mejorar la administración de sus propiedades. Las prácticas actuales se caracterizan por un enfoque holístico para enfrentar intervenciones complejas, situando a los usuarios al centro del proceso. Los desafíos principales se relacionan a la institucionalización: la inclusión de más incentivos para ampliar y consolidar al tercer sector como un actor relevante en la administración de viviendas y condominios.

# IN.NI

## Research panorama



# Ongoing projects 2018



# Integration of Temperature Sensors Into a CMOS Image Sensor



**Summary:** Most of image sensors devices, like cameras and mobiles, are based on CMOS technology. CMOS has become the leader technology due to its low cost and is highly integrable in mobiles, tablets and laptops. These devices suffer from dark current noise which is one of the main contributors of the total noise of the images. Dark current highly depends on temperature. Also, self-heating of the circuitry surrounding the image pixels locally contributes to thermal difference. Dark current is now compensated by using temperature sensors outside of the pixel array. The aim of this research is to measure temperature difference locally into the pixel array itself to compensate the dark current effect.

**Resumen:** La mayoría de los sensores de imágenes, tales como cámaras y celulares, se diseñan con tecnología CMOS. Esta tecnología es la más usada debido a su bajo costo y la fácil integración dentro de laptops y celulares. Estos dispositivos sufren de ruido de corriente térmica, el cual contribuye de gran manera al ruido total de la imagen. El ruido por corriente térmica depende en gran medida de la temperatura. Actualmente, este ruido se compensa usando sensores de temperatura externos al sensor de imagen. El objetivo de esta investigación pretende integrar los sensores de temperatura dentro del sensor de imágenes para compensar el efecto del ruido térmico.



## Introduction and Results

In a CMOS image sensor of 192x64 pixels around 500 temperature sensors have been uniformly integrated. These temperature sensors are based on Bipolar transistors (BJT). The temperature is measured by using the Base-Emitter voltage difference ( $\Delta V_{BE}$ ). This voltage is proportional to absolute temperature:

$$\Delta V_{BE} = V_{th}T \cdot \ln(pr)$$

where  $V_{th}$  is the thermal voltage 26mV @ 25°C, and  $pr$  is the ratio between two different biasing currents.

Figure 1 shows a picture using the image sensor. The black dots correspond to the temperature sensors.

Figure 2 shows average temperature measurements of the 500 BJTs in a range of 30 – 100 °C. The average error is less than 0.2°C, as shown in Figure 3. However, the individual  $3\sigma$  error is close to 2.5°C and the global  $3\sigma$  error is almost 15°C.

Results show that it is possible to integrate temperature sensors into a CMOS image sensor. Temperature measurements have been done in a range of 30 - 100°C by using the BJTs showing a very good accuracy in this range. More measurements are ongoing.



Figure 1: Picture taken by the image sensor. Black dots correspond to the temperature sensors.

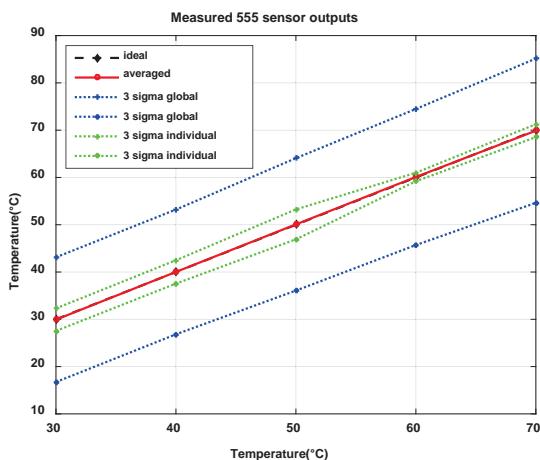


Figure 2: Average temperature measurement in a range 30-100°C.

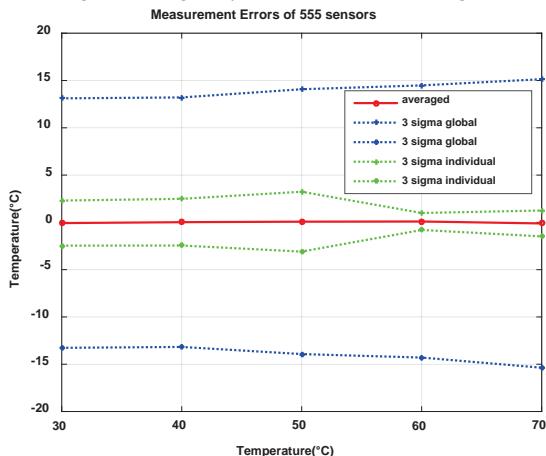


Figure 3: Error of the temperature measurements.

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- Authors, editors (year) Title, subtitle, publisher, city, ISBN/ISSN

# Informal settlements & disasters

## Coping with floods

### The case of Tierra Amarilla, Atacama - Chile



In a context of water scarcity and urban expansion, a simple trigger such as the increase in precipitations can cause a disaster, unveiling the vulnerabilities present in the landscape. This research explores the dynamics of informal settlements when coping with floods, and their potential role in its mitigation by using local knowledge.

En un contexto de deficiencia hídrica y expansión urbana, un simple detonante como el aumento en las precipitaciones, puede causar un desastre, develando las vulnerabilidades presentes en el paisaje. Esta investigación explora las dinámicas de los asentamientos informales cuando lidian con inundaciones y su posible rol en su mitigación, mediante el uso de conocimiento local.



#### INFORMAL SETTLEMENTS & HAZARDSCAPES

Informal settlements are present in many hazardous locations around the globe, among them; rivers and floodplains are some of the most common. These inhabitants usually represent the most vulnerable segment of the population, therefore, when a disaster occurs, they are the most affected (Bouwer et al. 2007; De Risi, 2013). That vulnerability can be understood in terms of a lack of community resilience, with lack or absence of resources to cope with the disaster. In addition, when the landscape is not resilient, the negative effects are even greater. Desert landscapes are environmentally very vulnerable, with sensitive ecosystems, where even minimal changes can cause major disruptions. They are some of the most extreme examples of a landscape with low resilience.

This thesis attempts to explore the potential of knowledge from informal settlers for landscape design for flood mitigation, recognizing the complexities of working with informality, uncertainty and the ephemeral.

#### DESIGN QUESTION

Which design interventions derived from the knowledge of informal settlers can mitigate the impact of floods?

#### RESEARCH QUESTIONS

- Why do informal settlers dwell in hazardous locations?
- How are informal settlers coping with flood risk in desert areas?



Image of Barrionuevo informal settlement next to Agua Amarilla ravine in Tierra Amarilla. Source: Author

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# Environment and development: a discursive puzzle from peripheral areas

## Aysén region (Northern Patagonia, Chile)



In places with a predominantly natural heritage, environmental and development discourses are intertwined and often contested, entangling diverse social actors and their interests. In addition, such discourses influence the way ecosystems are governed. In this research, I address the regional perspectives on environment and development through the reconstruction of environmental and development discourses.

En lugares con un patrimonio natural predominante, discursos sobre desarrollo y medioambiente son con frecuencia divergentes, opuestos e intrincados en una compleja red de intereses y actores sociales, abarcando diferentes escalas territoriales y administrativas. Del mismo modo, dichos lugares por lo general corresponden a ubicaciones geográficas y políticas periféricas en el territorio. En esta investigación se abordan las perspectivas regionales de medioambiente y desarrollo a través de la reconstrucción de los respectivos discursos.



### The Aysén region and its peripheral condition

In countries like Chile, territorial inequalities are perceived throughout the country.



Traditionally, peripheral areas have been defined in structural and static terms, in relation to their geographic distance to urban centers, remoteness, elevated travel and service costs, and lack of innovation. A negative connotation is usually ascribed to peripheries. Peripheries are backward.

"Peripheralization" process, as a way to understand social dynamics with spatial implications.

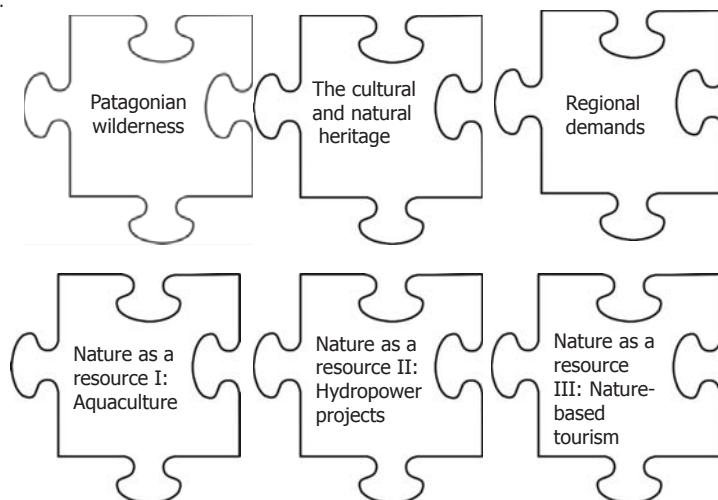
This research aims to identify and characterize the main environmental and development discourses that are playing out on a regional context, in order to assess:

- to what extent these discourses are influencing or might influence in the future regional policy-making processes.
- to what extent they are contributing to the peripheralization (or de-peripheralization) processes of the Aysén region.

Discourses were re-constructed based on 28 semi-structured interviews with key informants, complemented with observation method and secondary sources review. Primary and secondary information were analyzed with coding and content analysis methodology, with the aid of Atlas.ti software.

### Dissecting the puzzle

- Description of discourses may vary depending on the observer's perception.
- The definition of environmental and development discourses is a contested concept by itself.
- Whether the pieces of the puzzle fit together, is a matter of discussion.
- Discourses show the resources in struggle.



**The discursive puzzle**

These discourses can be interpreted as pieces of a "discursive puzzle", that coexist shaping the daily-life, the environmental governance, the policy-making and the regional development of the Aysén region.

### PROJECT INFORMATION

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### ONGOING RESEARCH

PhD Research 2015-2019

# Reducing Animal Testing

## Cell-based screening method for detection of lipophilic marine biotoxins

Marine biotoxins are a constant threat in Chile. Currently, the detection method for these toxins in shellfish products is the mouse bioassay (MBA), where a mouse is injected with the suspected sample and the occurrence of death indicates a positive result. This project investigated the possibility of replacing the use of the mouse bioassay for the use of two cell lines that can be grown in the lab, where no animals are needed. This method is suitable for the detection of diarrhetic shellfish poison (DSPs) in shellfish products, and the main idea behind is to reduce and replace animal testing for something more animal friendly but also efficient and specific for the toxins.

Este Proyecto tiene como finalidad el reemplazo del uso del bioensayo en ratón en la detección de toxinas marinas diarreicas (VDM o veneno diarreico de mariscos). La idea es reemplazarlo por una combinación de bioensayo, usando para ello células Neuro-2a, y una confirmación a través de ensayos de química analítica (LC-MS/MS).



### INTRODUCTION

The mouse bioassay (MBA) for the detection of marine biotoxins in seafood needs replacement. Like the MBA, an animal free alternative should detect both known and unknown toxins. Our new strategy combines cell-based bioassays with toxic effect measurements for screening and chemical analyses for confirmation and identification.

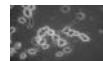
The Neuro-2a bioassay is used as the primary screening method. Samples scoring positive in the Neuro2A assay are confirmed by LC-MS/MS analysis. In case a suspect screened sample cannot be confirmed by the presence of a known toxin, additional testing is needed. For this, we developed a second bioassay, based on gene expression analysis of exposed human intestine Caco-2 cells, i.e. measurements of mRNA responses of selected marker genes using a multiplex qPCR or a Luminex bead-based multiplex assay. These methods enable the identification of toxin-related profiles. If such a toxin profile is found (e.g. in 3), further identification is started by a bioassay-directed LC-ToFMS analysis.

**CONCLUSION:** Analytical methods and bioassays together constitute a reliable strategy to replace the mouse bioassay.

### MATERIAL & METHODS

#### 1. SCREENING with neuro-2a

##### Neuro 2a cells



96 wp  
RPMI 10% FBS

##### Extraction & cleaning



n hexane  
SPE

##### Evaporation



DMSO

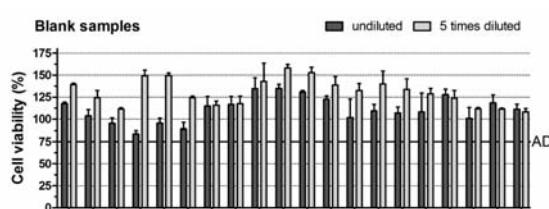
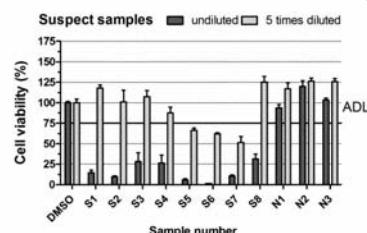
##### Dilution in media



Exposure

### RESULTS

#### 1. SCREENING with neuro-2a



#### 2. CONFIRMATION – LC-MS/MS

Sample	OA, DTXs, PTX-2*	AZAs *	YTXs*
S1	299	175	255
S2	168		1702
S3	243	280	1110
S4	401	386	
S5	757		462
S6	85	310	615
S7	1293	381	351
S8	371		

### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Marcia Bodero, Ron L.A.P. Hoogenboom, Toine F.H. Bovee, Liza Portier, Laura de Haan, Ad Peijnenburg, and Peter J.M. Hendriksen. (2017) Whole genome mRNA transcriptomics analysis reveals different modes of action of the diarrheic shellfish poisons okadaic acid and dinophysitoxin-1 versus azaspiracid-1 in Caco-2 cells\* Toxicol in Vitro <https://doi.org/10.1016/j.tiv.2017.09.018>
- Marcia Bodero, Toine F.H. Bovee, Si Wang, Mirjam D. Klijnstra, Liza Portier, Ron L.A.P. Hoogenboom, Peter J.M. Hendriksen and Arjen Gerssen (2017) Screening for the presence of lipophilic shellfish toxins in shellfish using the neuro-2a bioassay Food Addit Contam Part A Chem Anal Control Expo Risk Assess 1-15 <http://dx.doi.org/10.1080/19440049.2017.1368720>

# Producing more food, with less resources and in changing environments

## Quantitative methods for plant breeding



Climate change and the reduced availability of environmental resources challenge world food production. A strategy to increase crop yield is to use genetic variation to select varieties that are well adapted to target production environments. This process requires the evaluation of thousands of plants, making plant breeding slow and expensive. Quantitative methods (statistical and crop growth models) allow the integration of new technologies for genetic characterization, facilitating the identification of well adapted varieties.

El cambio climático y la menor disponibilidad de recursos ambientales dificultan la producción de alimentos. Una estrategia para aumentar los rendimientos de los cultivos es utilizar la variabilidad genética para seleccionar variedades mejor adaptadas a los ambientes de producción. Esto requiere evaluar miles de plantas, haciendo el mejoramiento lento y costoso. Métodos cuantitativos (modelos estadísticos y de cultivo) permiten integrar información de nuevas tecnologías de caracterización genética, facilitando la identificación de variedades bien adaptadas.



### THE MODERN BREEDING PROCESS

- In plant breeding, parents with interesting characteristics (traits) are crossed to generate genetic variation in the progeny.
- The progeny combines traits values from the parents. Some of these combinations are advantageous for plant adaptation (larger yield).
- Breeders select future varieties based on field measurements (phenotypes) and on genotypes DNA profiles.

### GENOTYPE BY ENVIRONMENT INTERACTION: A CHALLENGE FOR PLANT BREEDING

- Not all genotypes are well adapted to all environment types. E.g, some genotypes might be adapted to drought, and others to cold temperatures.
- Statistical methods allow to use meteorological information and historical yield data to identify environmental and genetic variables that drive these differences in adaptation.

### USING STATISTICAL AND CROP GROWTH MODELS TO INTEGRATE NEW TECHNOLOGIES FOR PLANT BREEDING

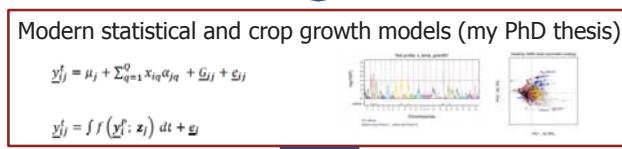
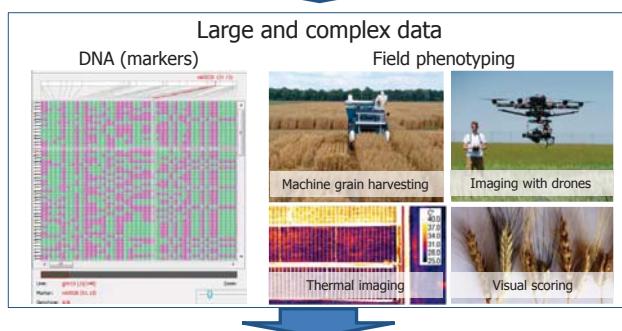
- The availability of molecular markers and high throughput phenotyping largely increases the availability of genotypic and phenotypic information.
- Statistical models allow to integrate the information, identifying genomic regions responsible for a better plant adaptation and predicting which genotypes will perform better in which environmental conditions.

### IMPACT OF NEW BREEDING TECHNOLOGIES IN EUROPE

- New varieties contribute to sustainable cropping systems by producing more yield per unit of agronomic input.
- New breeding technologies potentially allow to increase European wheat genetic gain from a 0.86% per year to a 0.95% per year. This is translated into ~14.9 M tons of additional wheat per year (~2.2 M €).

### POTENTIAL APPLICATION IN CHILE

- Chile is suffering from more extreme climatic events and from a desertification that moves South. For that reason, crops are reallocated to new growing regions (e.g. wineries and fruticulture moving South).
- Statistical and crop growth models are promising tools to predict the degree of success of new crops/varieties to these new growing regions, contributing to an agriculture that is more efficient and that has lower risk of losses.



### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Bustos-Korts, D.** 2017. Modelling of Genotype by Environment Interaction and Prediction of Complex Traits across Multiple Environments as a Synthesis of Crop Growth Modelling, Genetics and Statistics. PhD thesis, Wageningen University.
- Bustos-Korts, D., M. Malosetti, S. Chapman, B. Biddulph, and F. van Eeuwijk.** 2016. Improvement of Predictive Ability by Uniform Coverage of the Target Genetic Space. *G3 Genes | Genomes | Genetics* 6(11): 3733–3747.
- Bustos-Korts, D., Malosetti, M., Chapman, S., and van Eeuwijk, F.** 2016. Modelling of Genotype by Environment Interaction and Prediction of Complex Traits across Multiple Environments as a Synthesis of Crop Growth Modelling, Genetics and Statistics. p. 55–82. In Yin, X., Struijk, P.C. (eds.), *Crop Systems Biology - Narrowing the Gaps between Crop Modelling and Genetics*. Springer.
- van Eeuwijk, F. A., **Bustos-Korts, D. V., & Malosetti, M.** (2016). What Should Students in Plant Breeding Know About the Statistical Aspects of Genotype × Environment Interactions? *Crop Science*, 56, 2119–2140. <http://doi.org/10.2135/cropsci2015.06.0375>
- Malosetti, M., **Bustos-Korts, D. V., Boer, M. P., & van Eeuwijk, F. A.** (2016). Predicting Responses in Multiple Environments: Issues in Relation to Genotype × Environment Interactions. *Crop Science*, 56, 2210–2222. <http://doi.org/10.2135/cropsci2015.05.0311>

# Is Urban Agriculture Urban Green Space?

## A comparison of policy arrangements for urban green space and urban agriculture in Santiago de Chile



Green spaces are crucial for the wellbeing of citizens in increasingly urbanized societies. Yet, many Latin American cities struggle to provide sufficient and equitable distribution of green spaces to their citizens. The paper takes stock of similarities and differences between current green spaces and urban agriculture as modes to provide urban green spaces in Santiago de Chile. While examining the policy innovations UA practice brings to the current urban green space planning policies. This paper examines whether the growing urban agriculture movement provides a feasible opportunity to increase public green space.

Las áreas verdes públicas son fundamentales para el bienestar de los ciudadanos. No obstante, muchas ciudades Latinoamericanas enfrentan el desafío de lograr una distribución equitativa en la calidad y cantidad de áreas verdes entre sus ciudadanos. Tomando el caso de Santiago, esta investigación examina en qué medida y cómo el emergente movimiento de agricultura urbana es una oportunidad factible para expandir las áreas verdes públicas. Y, en caso de serlo, qué innovaciones esto implica para las actuales políticas de planificación de áreas verdes en Santiago.

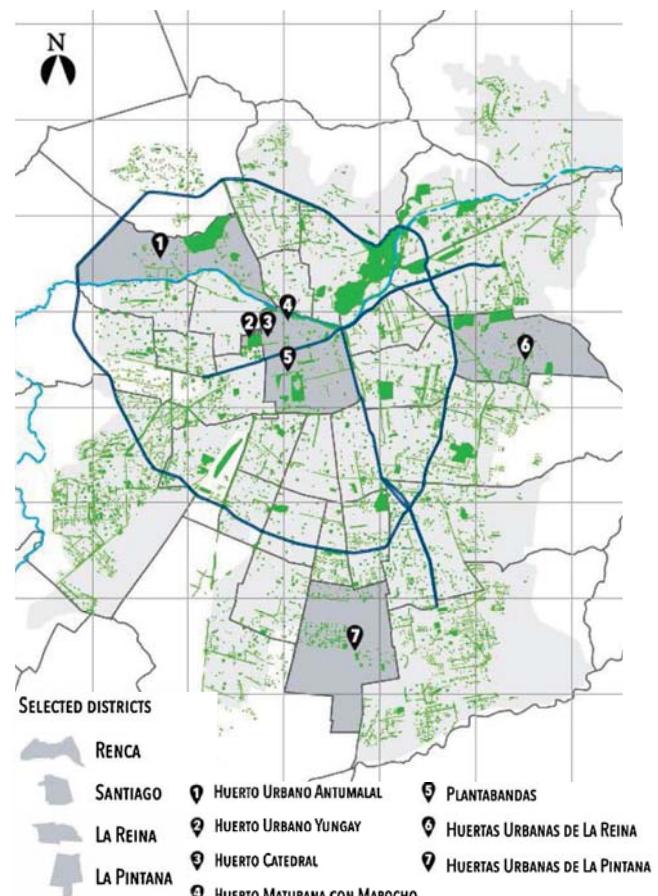


To analyze similarities and differences between current green spaces and urban agriculture as modes to provide urban green we used the Policy Arrangement Approach (PAA): a theory aimed to analyze stability and change within policy domains in the aid of four dimensions: discourses; rules of the game; power and resources; actors and coalitions. Similarities and differences were found in the following: both urban agriculture and new green spaces are planned in disused spaces that lack a more profitable use. While the status of parks is evident, the status of UA is still unresolved. They both offer cultural ecosystem services, such as: 'relaxation', 'contact with nature', 'leisure and recreation' and a number of other ecosystem services, such us: heat island effect regulation, biodiversity. Although both public and civil society actors are involved in green space and UA provision, civil society is much more involved in the latter, not only in the design and implementation processes but also in the management and maintenance of these spaces.

The analysis found that urban agriculture may facilitate the expansion of urban green spaces if policy mechanisms enable private or public spaces to be maintained by citizen organizations, or by an hybrid top-down/bottom-up supportive structure. This is new for Santiago, where public green space maintenance is limited to public agencies, despite the highly unequal economic resources among them. Such mechanisms may, however, encounter resistance from public agencies as it is unresolved who is involved and who benefits from urban agriculture. As a public green space, urban agriculture also requires the acceptance of spaces where individual and collective uses mix. The paper concludes that urban agriculture is an opportunity for greening Santiago, although changes are needed in how green areas are planned and conceived. Additionally, urban agriculture should not be understood as a substitute of parks but as a complementary form of green space provision with a distinctive value.



Francis Candia from Huertas de La Pintana (Credit: the author)



Overview of Santiago, indicating in green existing green spaces (not necessarily public)  
Source: Geospatial Infrastructure Data of Chile ([www.ide.cl](http://www.ide.cl))

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This poster can be found as a published paper in:

Contesse, M., van Vliet, B.J.M., Lenhart, J. (2018). Is Urban Agriculture Urban Green Space: a comparison for policy arrangements for urban green space and urban agriculture in Santiago de Chile. *Land Use Policy*, 71, 566-577.

# JOSE RICARDO MORALES AND HIS TRANSNATIONAL THEATRE: THE KEY CONCEPTS OF COMMUNICATION, POWER, AND TECHNOLOGY



Society has been faced with several challenges concerning the advent of the Internet, nuclear technology, the commodification of the human being, etc. It can be found in several works within literature of the 20th Century. In this context, it is required to mention José Ricardo Morales 1915-2016, a Spanish-Chilean playwrights and writer on both sides of the Atlantic who contributed to the professionalization of theatre in Chile, establishing the Humanistic Theatre, where he anticipated several problems we are now facing in society: totalitarianism, globalization, and technology dependency. Notwithstanding, his work has received little scholarly attention.

Actualmente, la sociedad se ha enfrentado a diversos desafíos respecto al advenimiento de Internet, la tecnología nuclear, la mercantilización del ser humano, etc. Podemos encontrar estos tópicos en diversos trabajos dentro de la literatura del siglo XX. En este contexto, podemos mencionar a José Ricardo Morales 1915-2016, un dramaturgo y escritor español-chileno que escribe en ambos lados del Atlántico, quien contribuyó a la profesionalización del teatro en Chile, y también estableció el Teatro Humanista, en donde se anticipó a varios problemas que hoy en día nos enfrentamos como sociedad, tales como: totalitarismo, globalización, la dependencia tecnológica. Sin embargo, su trabajo ha recibido escasa atención en la academia.

## INTRODUCTION

How is the concept of *Post-Truth* articulated in Morales' piece of theatre *Como el poder de la noticias nos da noticias del poder* (1971)?

## OBJECTIVE

Problematize the notions of communication, power and technology in José Ricardo Morales's transnational theatre.

## POST-TRUTH:

The quality of seeming or being felt to be true, even if not necessarily true (Oxford Dictionaries, 2016).

"*POST-TRUTH* and *FAKE NEWS* are key markers of the current media-political situation" (Corner, 2017).

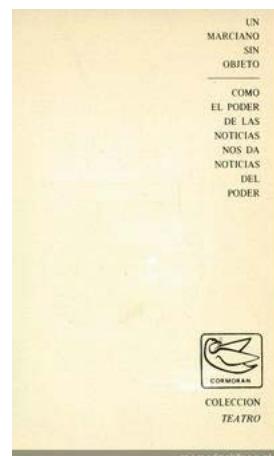
**ANALYSIS:** *Como el poder de las noticias nos da noticias del poder* [How the Power of News can give us News about Power] (1971) by José Ricardo Morales

It deals with the role of journalism in the 1970s, focusing on the particular role of a journalist participating in different scenarios and contexts interviewing a politician who dreams of becoming a totalitarian President.

suits in Morales' Transnational Theatre and his idea of responding the uncertainty and the searching of the human understanding not only in terms of ideology and issues, but also presenting the human being inventing him/herself.

## CONCLUSIONS

In the 1970s, José Ricardo Morales was already problematizing about what is known today as "FAKE NEWS".



## PROJECT INFORMATION

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## RELATED PUBLICATIONS

- Valdivia, P. (2017). *José Ricardo Morales de mar a mar. Teatro transnacional, exilio y periferia*, Biblioteca del exilio, Renacimiento, Barcelona, ISBN: 9788484725367.

# Increasing consumers' familiarity and choice for ethnic foods

## Think global, act local

Nowadays, globalisation has elicited the diversification of ethnic foods all around the world. Tacos, sushi and lasagna are widely known and consumed, *i.e.* consumers are familiar to these products. However, many other ethnic foods do not share the same popularity and the reasons are unknown. Therefore, the aim of this research is to identify the key drivers influencing the perceived quality and choice of ethnic foods, specially the role of familiarity, in order to develop new valorisation strategies to, *e.g.* potentiate the consumption of healthier foods.

La globalización ha permitido la diversificación de los alimentos étnicos alrededor del mundo. Tacos, sushi y lasaña son ampliamente conocidos y consumidos, *i.e.* los consumidores están familiarizados. Sin embargo, varios de ellos no tienen el mismo nivel de popularidad y las razones son desconocidas. Por lo tanto, esta investigación se enfoca en identificar los factores claves que influyen en la percepción de calidad y elección de alimentos étnicos, con especial enfoque en la familiaridad en países con distintos niveles de globalización, con el objetivo de desarrollar estrategias de valoración que, por ejemplo, potencien el consumo de alimentos saludables.



### Research project

Ethnic foods have a strong connection to the cultural identity and traditions of a country. Their evolution, legacy throughout generations, and interaction with cuisines from different countries make them an interesting type of food product to further study consumer behaviour (Guerrero *et al.*, 2009). Globalisation has elicited the positioning of ethnic foods around the globe. However, little information is available regarding the perceptions and preferences of consumers for ethnic foods and how familiarity plays a role on their acceptability.

Product familiarity has been related to several product-related experiences such as knowledge, product availability, and consumption frequency (figure 1). In our previous study, we analysed the influence of familiarity on the choice of canned whole peeled tomatoes in three countries: Chile (low familiarity), The Netherlands (medium familiarity), and Italy (high familiarity), finding interesting similarities and differences that shaped their perceptions and preferences when choosing specific attributes combinations (Frez-Muñoz *et al.*, 2016). Therefore, it can be hypothesized that the level of ethnic foods' globalisation of each country will have an impact on the familiarity for these products, which may influence on consumers acceptance for new ethnic foods. Hence, this aims at: (I) determining the level of ethnic foods' globalisation in different countries by analysing the familiarity level towards ethnic foods when compared to local traditional foods in 12 countries (figure 2); (ii) identifying the key drivers and barriers influencing the perceived quality and choice of ethnic foods in countries with contrasting levels of ethnic foods' globalisation; and (iii) determining how key drivers could be adapted in order to increase the familiarity towards ethnic foods based on consumers' needs and requirements. A mixed method approach will be used by combining qualitative and quantitative research techniques, which will allow to both understand the dynamics of consumers perceptions and preferences and to generalize the findings to a broader population, respectively.

The information gathered in this research will give new insights into the role of familiarity on the acceptability of (ethnic) foods. Knowledge that could be used to formulate new valorisation strategies for existent or new (ethnic) foods to be introduced in a foreign market. In addition, it could be transferred to other scenarios such as developing new strategies to increase the familiarity towards healthier diets.

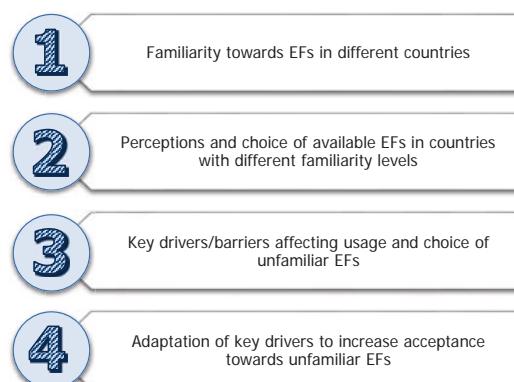


Figure 1. Subprojects of this PhD proposal.



Figure 2. Countries to be studied in this research.



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### RELATED PUBLICATIONS

- Frez-Muñoz, L., Steenbekkers, B. L., & Fogliano, V. (2016). *The Choice of Canned Whole Peeled Tomatoes is Driven by Different Key Quality Attributes Perceived by Consumers Having Different Familiarity with the Product*. *Journal of Food Science*, 81(12), S2988-S2996.
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# Digital immersion in teenagers

## Psychological, cultural and socio-structural factors associated to digital immersion in Chilean teenagers.



This research aims to examine the influence of psychological, cultural and socio-structural factors in digital immersion for teenagers in the Araucanía Region (Southern Chile). A total of 694 Chilean teenagers participated in this study. Preliminary results show that the highest percentage of adolescents (64%) are considered to be in an average level of digital immersion. The motivation to use the technologies is the most important factor to predict this immersion, followed by the attitude towards the use of technologies.

Esta investigación tuvo como propósito examinar la influencia de factores psicológicos, culturales y socio-estructurales en la inmersión digital de adolescentes de la Región de La Araucanía. Un total de 694 adolescentes chilenos participaron en este estudio. Los resultados preliminares muestran que el mayor porcentaje de adolescentes (64%) se consideran en un nivel medio de inmersión digital. El factor más importante para predecir esta inmersión es la motivación por usar las tecnologías, seguido por la actitud hacia el uso de las tecnologías.



### BRIEF BACKGROUND

Nowadays, teenagers are growing in an environment in which many aspects of their lives are mediated by digital technologies (Boyd, 2014). In fact, it seems that modern teenagers' lives are deeply immersed in digital technologies. For this reason, the study of digital immersion was considered relevant. This concept is understood as a behavior that indicates the way in which people develop in an environment in which digital technologies exist. Digital immersion is regarded as a persistent and enthusiastic use of digital media and devices mainly focused on technological activities, accompanied by feelings of identification and dependency.

### METHOD

The design of this study was non-experimental, cross-sectional and descriptive correlational. 694 teenagers from different schools located in urban and rural areas from La Araucanía Region of Chile, who came from different social backgrounds as well (according to SES), participated in the study. 50% of the participants were men (349) with an average age of 16 ( $SD = 1.3$ ). Average age of the women was 16.2 ( $SD = 1.4$ ).

The following scales were used in this study: Digital immersion, Motivation Scale (Helsper, 2017), Satisfaction (Helsper, van Deursen, & Eynon, 2015), Revised Portrait Values Questionnaire (PVQ-RR) (Schwartz et al., 2016), Questionnaire on Skills (from DISTO NEETS) (van Deursen, Helsper, & Eynon, 2016), Attitude Towards Use (Teo, 2011) and a sociodemographic questionnaire.

### PRELIMINARY RESULTS

The hypothesized model is presented in figure 1. The initial fit results obtained from testing the validity of a causal structure of the conceptual model were not satisfactory. Some paths were not significant. The model was then refined to improve the good-fitting measurement model (figure 2). According to AMOS sw, the model's goodness-of-fit indexes were:  $\chi^2(22)=30.113$ ;  $p < 0.116$ ,  $CFI = 0.998$ ,  $TLI = 0.995$ ,  $RMSEA = 0.023$ .

### PRELIMINARY CONCLUSIONS

This study provides an important opportunity to advance in the understanding of the relation between Chilean teenagers and technology. Moreover, it will surely offer some important insights into the digital divide, since some indicators of first and second level are considered. According to van Dijk (2018), the first level includes physical access, while the second level takes into account the skills and use, and the third level considers the benefits of using digital media. In Chile, the physical access digital divide is decreasing. According to the Sub-Secretariat of Telecommunications of Chile, the percentage of Internet access in 2015 was 71.6% (Pinto de la Fuente and González, 2016). For this reason, more and more Chilean researchers must focus their work on the second and third levels of the digital divide.

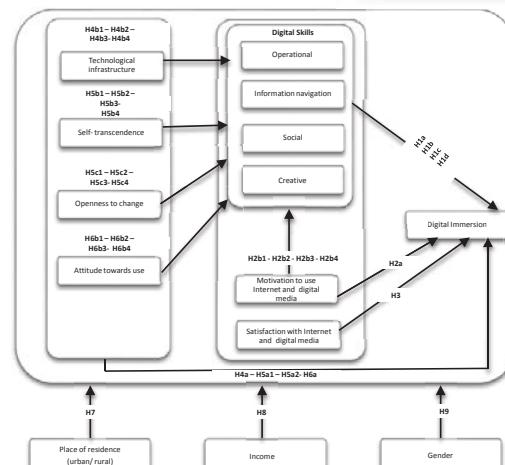


Figure 1. Presentation of the study's hypothesized relationships.

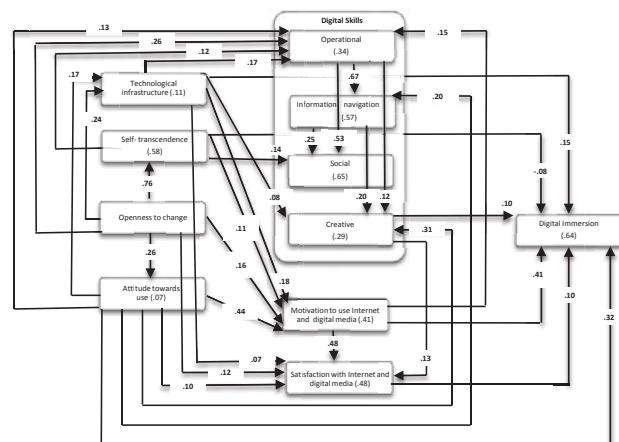


Figure 2. Current model with the standardized path coefficients (All paths significant with:  $p < .05$ ) . Squared multiple correlations are inside the boxes.

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### RELATED PUBLICATIONS

- Boyd, d. (2014). *It's complicated: the social lives of networked teens*. New Haven + London: Yale University Press.
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# Fornax Dwarf Galaxies Morphology

## Next Generation Fornax Survey



Analysis of the CAS (Concentration, Asymmetry, Smoothness) parameters of 313 dwarf galaxies in the Fornax Cluster, using observations from the *Next Generation Fornax Survey (NGFS)*, conducted with the Dark Energy Camera (DECam), at Cerro Tololo Interamerican Observatory, in three different filters: *u*, *g*, *i*. We compare the three parameters against each other, and also their relation to the presence of a nucleus in the galaxy and to the ellipticity of the galaxy.

Análisis de los parámetros CAS (sigla en inglés para Concentración, Asimetría, Varianza de Brillo Superficial) de 313 galaxias enanas del Cúmulo de Fornax, con observaciones del *Next Generation Fornax Survey (NGFS)*, obtenidas con la Dark Energy Camera (DECam), ubicada en Cerro Tololo Interamerican Observatory, en tres filtros: *u*, *g*, *i*. Comparamos los tres parámetros entre ellos, y también estudiamos la relación entre estos parámetros y la presencia de un núcleo en la galaxia y la elipticidad de la galaxia.



### THE NEXT GENERATION FORNAX SURVEY (NGFS): VII. FORNAX DWARF GALAXIES MORPHOLOGIES

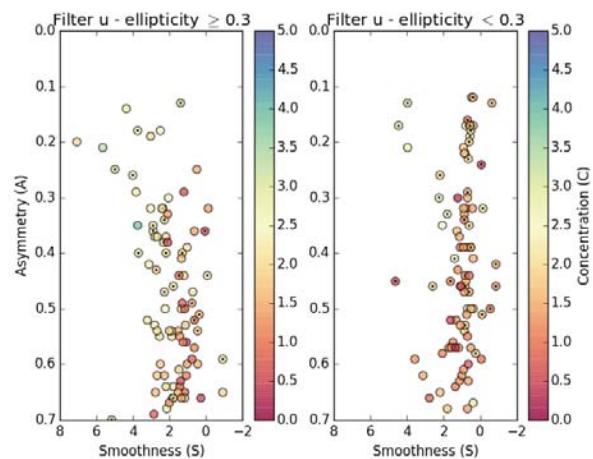
Guadalupe Lizana-Estivill et al. 2018, to appear in Astrophysical Journal.

The CAS parameters (Conselice 2014) are non-parametric, therefore are useful to describe the galaxy's structure without making previous assumptions about it. Each parameter is an indicator of a different feature in the galaxy: Asymmetry indicates mergers between galaxies; Concentration reveals information about the galaxy's evolution and its mass; and Smoothness is related to present star formation.

Asymmetry values go from 0 (perfectly symmetric, rounded galaxies) to 1 (completely asymmetric galaxies); a higher value of Concentration, means that most of the galaxy light is concentrated in a central region; and higher values of Smoothness could indicate star forming regions in the galaxy.

We study the distribution of these parameters in the Fornax Cluster; the relation between each parameter with each other and with the presence of a nucleus in the galaxy, separating the galaxies between more elliptical and more rounded ones, in order to determine if the nucleus or the ellipticity affect the morphology of the galaxy.

We find that the nucleus plays a major role in the morphology parameters than ellipticity, because there is a greater relation between the presence of a nucleus and each parameter, but the tendency is not so clear with ellipticity for all the parameters.



E.g.: Asymmetry vs. Smoothness, with Concentration as a color map, for filter *u*. Nucleated galaxies are marked with a black dot in the center, and the 0.3 cut value for ellipticity is the median value of the sample.

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# Adolescent Substance Use Disorder in Chile

## The role of the family in the maintenance and abstinence

**Summary:** In 2013, more than 4,300 young people under 25 year old received drug treatment within the Chilean National Treatment Program. However, despite of the problems of these adolescents begin in or are produced by their family context, all programs are focused on personal factors. The general aim is to improve the drugs treatment programs for adolescents in Chile, through the enhancement of the intervention with their families.

**Resumen:** En el año 2013, más de 4.300 jóvenes menores de 25 años accedieron a tratamiento en el Programa Nacional para El Consumo Problemático de Drogas chileno. No obstante, a pesar que la mayoría de los problemas de estos jóvenes comienzan en o se producen dentro del contexto familiar, los programas de tratamiento se focalizan en la intervención de factores personales. El objetivo general es mejorar los programas de tratamiento para adolescentes, a través de la intervención con sus familias.



### RESEARCH PROJECT

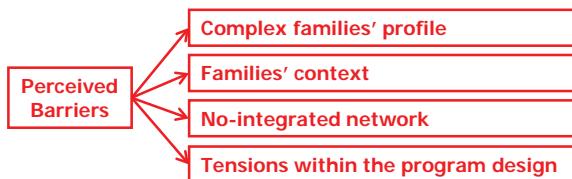
The research considered three lines:

1. Drug treatment professionals' perceptions related to young offenders' families and tutors. Semi-structured interviews with clinicians.
2. Parents/tutors' perceptions related to their relation with the young offender in treatment, their problems and needs. Semi-structured interviews for parents/tutors (*in analysis stage*).
3. Parental factors related to substance use disorder (SUD) in Chilean Young Offenders in drug treatment. Self-report questionnaires for adolescents about drug use, self-control and parenting factors.

#### Line 1

##### Professionals' perceived barriers to intervene with young offenders' families in drug treatment

Aim: to explore professionals' perspectives of perceived barriers to intervene with parents or responsible adults of young offenders with substance use disorder.

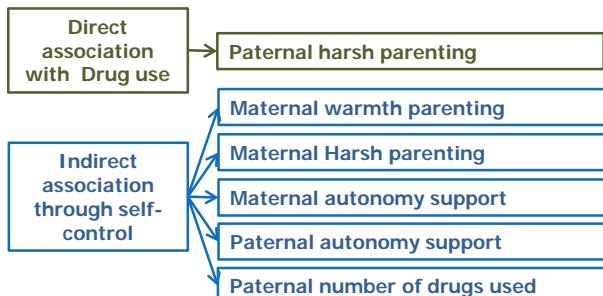


Professionals have a negative concept of young offenders' families, the family context and the intervention itself. It makes them feel hopeless and they are pessimistic about the effectiveness of the current program.

#### Line 3

##### Parenting Skills are Associated with Substance use Disorder in Young Offenders in Drug Treatment

Aim: to evaluate whether parenting skills were directly associated with drug use and indirectly associated through self-control in young offenders with substance use disorder who are in treatment.



Young offenders with Substance use Disorder is a difficult group to treat successfully. The insights of the current study on parenting indicate that it might be fruitful to extend this line of research in order to explore – among others - whether parents style may be a promising avenue to improve young offenders' outcomes in drug treatment.

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#### RELATED PUBLICATIONS

- Lobato, M., Sanderman, R., Pizarro, E. et al. (2017) *Marijuana Use and Dependence in Chilean Adolescents and Its Association with Family and Peer Marijuana Use*. International Journal of Behavioral Medicine, 24(1), 144-152. DOI: 10.1007/s12529-016-9595-2

# High intensity interval training and skeletal muscle insulin sensitivity in humans

## Unravelling health effects and underlying mechanisms

Skeletal muscle insulin resistance (IR) comprises reduced intracellular glucose oxidation and non-oxidative glucose disposal (NOGD). NOGD largely refers to glycogen storage. Exercise training is a cornerstone for the prevention and treatment of IR, however conventional exercise interventions have shown a partial restoration of insulin sensitivity as mainly NOGD remains unchanged. Thus, high intensity interval training (HIIT) seems to be a potent strategy as it boosts cyclic glycogen turnover and therefore it may restore NOGD and IR.

Resistencia a la insulina en el músculo esquelético (IR) comprende una reducción en la oxidación intracelular de glucosa y su eliminación por la vía no oxidativa (NOGD). NOGD se refiere principalmente al almacenamiento de glucosa en forma de glicógeno. El ejercicio físico es fundamental en la prevención y tratamiento de IR, sin embargo intervenciones de ejercicio convencionales han demostrado una restauración parcial de la sensibilidad a la insulina debido a que NOGD permanece intacta. Por lo tanto, entrenamientos intervalados de alta intensidad (HIIT) parecen ser una estrategia potente debido a su capacidad para estimular una fluctuación cíclica del contenido de glicógeno muscular y por lo tanto restaurar NOGD e IR.



### MAIN RESEARCH AIMs:

- 1.- Determine whether a supervised HIIT period (12 weeks) improves the non-oxidative glucose disposal (NOGD) pathway in skeletal muscle of obese adults subjects.
- 2.- Explore whether the consumption of a carbohydrate-rich drink during/post exercise prevents the adverse effects related to glucose fluctuations, while maintaining NOGD, and promotes the adherence of the subjects to the training program in the long term.

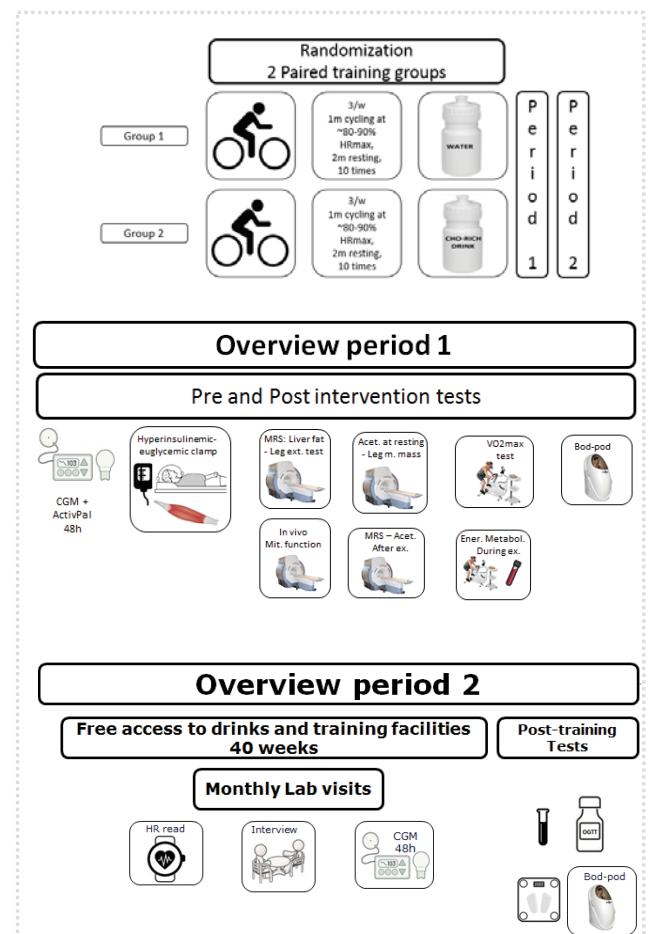
### STUDY DESIGN AND METHODS:

44 obese/overweight pre-diabetic adult subjects will be randomized to 2 different training groups; 1) HIIT+WAT: High intensity interval training who will consume water during/post exercise and 2) HIIT+PRO/CHO: High intensity interval training who will consume an insulinogenic, carbohydrate-rich drink during/post exercise. The training intervention will be divided in 2 periods.

**Period 1:** Subjects will train 3 times per week during 12 weeks under supervision. Pre and post training, subjects will follow multiple metabolic tests:

- Whole body insulin sensitivity measured by 2 step euglycemic hyperinsulinemic clamp.
- 2 muscle biopsies during the insulin sensitivity test
- 24h glycaemic profile under standardized diet conditions
- Substrate oxidation during exercise by indirect calorimetry
- Hepatic fat accumulation, *in vivo* skeletal muscle mitochondrial function, exercise-induced acetyl carnitine formation and muscle mass by MRS/MRI.
- Cognitive performance, quality of life and mood state by questionnaires.

**Period 2:** After the 12 weeks training period, subjects will have free access to the gym facilities and to the insulinogenic, carbohydrate-rich drinks during 40 weeks without supervision. Every 4 weeks, subjects will visit the laboratory to test their training adherence. Every 8 weeks, the 24h glycaemic profile will be measured under standardized diet conditions.



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# Risk perceptions in Marine Spatial Planning

## Political ecology of risk regarding seaweed cultivation in the estuary of Maullín

The research was conducted in the estuary of Maullín in order to understand how environmental risk linked to seaweed cultivation is integrated within the marine spatial planning. By observing empirically the contestation of risk, the analytical framework links the concept of political ecology and the constructivist approach to risk. In this way, the research aims to understand how risk is used, at the regional and local scales, as a boundary concept to enact spatial planning?

La investigación se realizó en el estuario de Maullín para comprender cómo se integra el riesgo ambiental vinculado al cultivo de algas en la planificación espacial marina. Al observar empíricamente la impugnación del riesgo, el marco analítico vincula el concepto de ecología política y el enfoque constructivista del riesgo. De esta manera, la investigación tiene como objetivo comprender cómo se utiliza el riesgo, a escala regional y local, como un concepto de frontera para promulgar la planificación espacial.



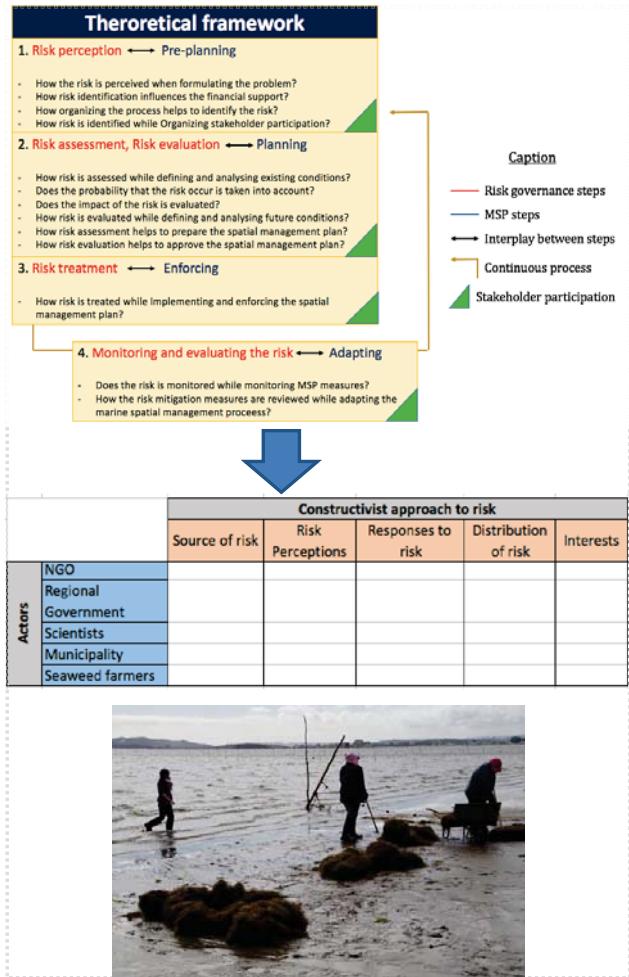
## Problem statement

The world population expects to reach up to 9 billions people in 2050 whereas natural resources are depleting tremendously. As a result, terrestrial space scarcity leads us to look at the marine space which covers 70% of the Earth. And seaweed aquaculture seems to be a serious alternative to the future challenges. However, marine space competition also exists due to other marine activities. And even though seaweed cultivation is known to be a low risk source, its interaction with other marine activities may generate an environmental risk.

In order to manage the environmental risk, Marine Spatial Planning (MSP) seems to be an interesting governance tool. It aims to manage the marine space in a holistic way in order to reduce conflicts of interests between different actors. However, risk management is not explicitly seen within the theoretical framework of the MSP. Therefore, one of the goal of the research is to integrate the Risk governance process within the MSP process in order to see if the environmental risk is taken into account.

In order to reach this goal, the theoretical framework, integrating MSP and Risk management processes, has been applied in the estuary of Maullín (Chile). The reasons of this choice could be explained by the illustration of the theoretical problem in the reality. Indeed, the estuary of Maullín, is characterized by a considerable aquaculture production of *Gracilaria chilensis* linked with an overload of human activities (salmon aquaculture, agriculture, tourism, fisheries).

Nevertheless after coming back from the field, the researcher became aware of the inadequacy of the theoretical framework to analyse the data. This observation may be explained by a quantitative positivist approach to risk within the framework which were not adapted for testing the Chilean situation. Indeed, the responses of the different actors interviewed (seaweed farmers, regional government, scientists and NGO) were essentially based on the first step of the framework: Risk identification. By observing the high contestation of risk among actors, the researcher has decided to interpret them using a framework based on the risk constructivist approach (Miller, 2003). This theory wants to explain that different environmental risk perceptions lead to different responses to risk that are influenced by actor's interests. This qualitative constructivist approach to risk is integrated within the political ecology theory. Political ecology of risk aims to understand how an environmental risk can be used by actors as a tool to control the environment and people within it in order to satisfy their own interests. Therefore the research objective aims to understand the importance of the risk perceptions in order to establish the marine spatial planning. To reach this objective, the research question answered at the regional and local scale will be: How is risk used as a boundary concept to enact marine spatial planning?



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## RELATED PUBLICATIONS

- Miller, F. (2003). Society-water Relations in the Mekong Delta: A Political Ecology of Risk (Division of Geography, School of Geosciences, University of Sydney)

# Brain mechanisms in Depression

## Interplay between neurotransmission, neuroinflammation and both sex and stress hormones in the development of depression.

This project aims to identify the different brain mechanisms and their interactions, involved in the pathology of depression, including neurotransmission, chronic stress and neuroinflammation processes. Combining Pharmacological manipulation and brain imaging (PET imaging), different changes between brain markers will be detected when comparing Naïve animals with an animal model of depression.

En este proyecto se identificarán los diferentes mecanismos y sus interacciones, asociados al desarrollo de la depresión, incluyendo los neurotransmisores, el estrés crónico y los procesos neuroinflamatorios. Combinando técnicas de manipulación farmacológica e imagenología en el cerebro (PET imaging), se espera identificar diferentes cambios en marcadores cerebrales de depresión, comparando animales naïve con un modelo animal de depresión.

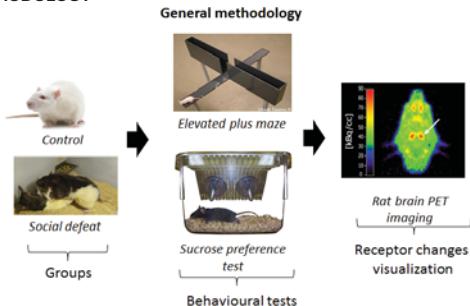


### BACKGROUND

According to the World Health Organization (WHO), around 350 million people suffer from depression around the world, and predictions indicate that by 2020, this pathology would be the second cause of disability (1). The majority of depressed patients experience a poor response to antidepressants (treatment resistance, partial effects) (2).

Many mechanisms and molecules interact in the pathology of depression, including neurotransmitters, sex and stress hormones, and neuroinflammation among others. This allows the possibility of searching new therapies for this psychiatric disorders, pointing to the modulation of these molecules dynamics.

### METHODOLOGY



To induce depressive symptoms, a social defeat model in rats will be used. To assess changes in anxiety and depressive-like behavior, Elevated plus maze and Sucrose preference test will be used. PET scan will assess different markers changes in different areas of the brain. Pharmacological intervention may be used before behavior to see changes in both behavior and markers.

### FUTURE INSIGHTS

In this research we want to focus mainly in the relationship between neurotransmitters, sex and stress hormones in the neuroinflammation markers changes in depression. To do this, we will identify significant changes between the 2 conditions and the main player areas, and then we will administrate different agonists or antagonists of different molecules to see the changes in the dynamics of the brain.

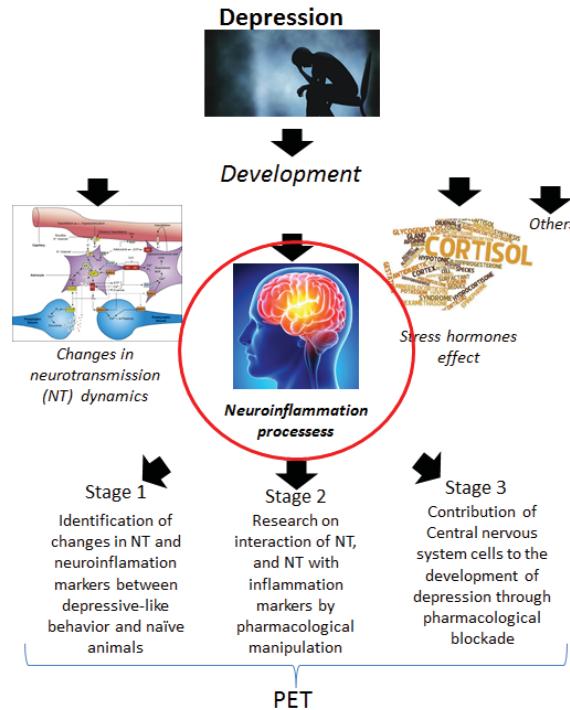
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### PROPOSAL



- In a first stage, we will identify the changes in different markers between animals with and without depressive symptoms. With this information, we will select the most relevant markers (based on their changes) and will try to see the effect of the administration of different agonists and antagonists of different brain receptors to determine their effect in other receptors or neuroinflammation markers availability, so we can determine the interaction effects on the molecular dynamics. Finally, using pharmacological drugs, we will block the specific activity of the Central nervous system cells (neurons, astrocytes, microglia) and determine if the behavioral and PET outcome can be blocked, so we will be able to determine the specific contribution of each cell to the development of depression.

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# Seismic Energy & Tall Buildings

## Distribution of Seismic Energy Outrigger Structures with Passive and Semiactive Dampers

When subjected to strong earthquakes, building structures equipped with damped outriggers may undergo plastic deformations before or while the dampers begin to work. Consequently, both the host structure's hysteretic behaviour and the dampers' performance need to be evaluated in parallel. This research provides an analytical framework to assess the distribution of seismic energy in tall buildings equipped with passive viscous dampers and semiactive magneto-rheological (MR) dampers.

En presencia de grandes terremotos, edificios construidos con estabilizadores (*outriggers*) equipados con amortiguadores pueden presentar deformaciones plásticas, durante o incluso antes de que los amortiguadores funcionen. Por ello es necesaria la evaluación simultánea de la histéresis de la estructura y el comportamiento de los amortiguadores. Esta investigación provee de un marco analítico para la evaluación de la distribución de energía sísmica, en edificios altos equipados con amortiguadores viscosos y amortiguadores magneto-reológicos semiactivos.



### ENERGY BALANCE EQUATION

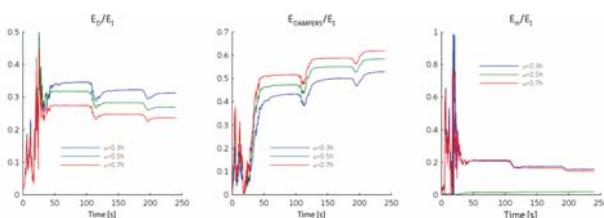
The earthquake input energy transmitted to a structure is related to the kinetic energy, elastic strain energy, damping energy, hysteretic energy and dampers energy. the energy balance equation for a MDOF system is given by

$$E_K + E_S + E_D + E_{DAMPERS} + E_H = E_I$$

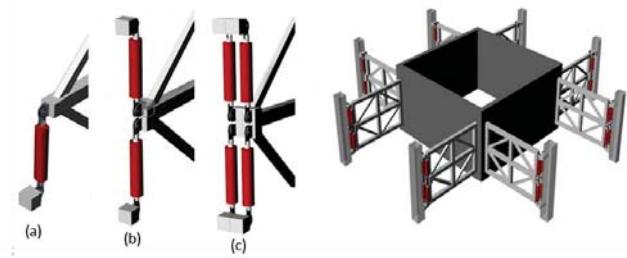
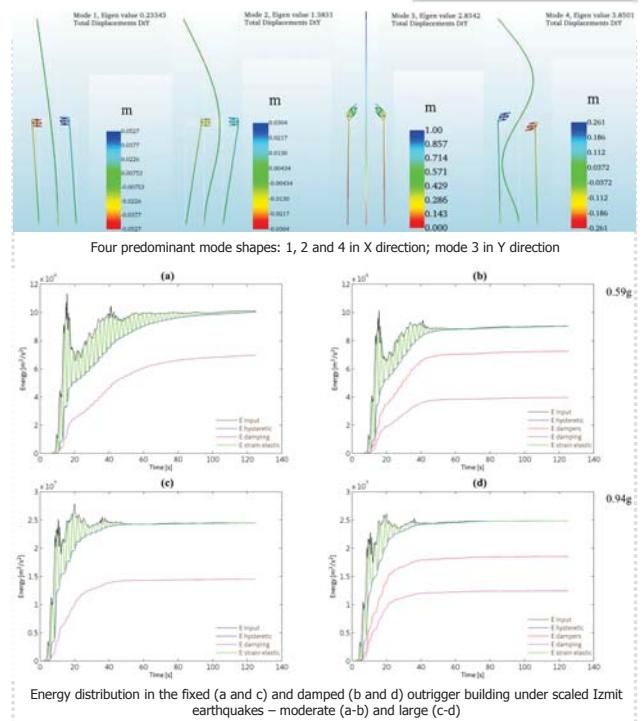
where  $E_I$  is the energy input at foundation of the building,  $E_K$  is the kinetic energy,  $E_S$  is the elastic strain energy,  $E_D$  is the energy dissipated through damping;  $E_H$  is the energy dissipated through hysteretic plastic deformation, and  $E_{DAMPERS}$  is the energy dissipated through the viscous dampers.

### METHODOLOGY

The energy assessment is based on the numerical study of 60-storey buildings equipped with conventional outriggers , and passive/semiactive damped outriggers, respectively. First, a parametric study addresses the influence of building natural period, position of the outrigger, damping coefficient, and stiffness ratio core/perimeter columns in the control performance of the outrigger structures. Secondly, the inter-dependency between structural properties of tall buildings equipped with damped outriggers and ground motion characteristics is examined under three long-period earthquake records. These ground motions are scaled to small, moderate and strong earthquakes to determine the nonlinear threshold. The distribution of seismic energy is based on the demand of total input energy –  $E_I$ . Maximum damping and hysteretic energies permit to evaluate the energy dissipation capacity to limit structural damage. These relationships can be expressed by (a) the hysteresis energy ratio  $E_H/E_I$ ; (b) Damping energy ratio  $E_D/E_I$ ; and (c) Supplemental damping ratio  $E_{DAMPERS}/E_I$ .



The purpose is to determine whether it is correct to assume that main structural components will remain elastic during the entire response of the building. In other words, to determine if the energy dissipation due to hysteresis can be fully replaced by energy dissipated through the action of dampers.



### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Morales-Beltran M, Turan G, Dursun O, Nijssse R. (2018) Energy dissipation and performance assessment of double damped outriggers in tall buildings under strong earthquakes, under review in *The Structural Design of Tall and Special Buildings*
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# Imagined food experiences

## The role of imagination in food consumption and marketing

Obesity epidemic is a major problem in Chile and worldwide. In the seductive environment of unhealthy choices in which we live, there are still possibilities to apply marketing strategies to steer people to make healthier choices, and limit the consumption of unhealthy food. In addition, these strategies aid to policy makers toward a better communication to promote healthy food products. This project intends to explore the processes underlying product evaluation and food choice by means of cognitive strategies that can be applied through product design, and explore in the food sensory context, the role of imagined food experiences.

La obesidad es un problema importante en Chile y en el mundo. Vivimos en un entorno que nos seduce a elegir alimentos poco saludables. Sin embargo, ante éste problema aún existen estrategias de marketing que nos ayudan a tomar decisiones más saludables. Este proyecto intenta explorar los procesos subyacentes a la evaluación del producto y la elección de alimentos, y asimismo investigar el rol de las experiencias imaginadas en las decisiones alimentarias.



### RESEARCH DESCRIPTION

Food packaging is the great importance to marketers; it serves to create effective messages and convey the right information to consumers, but could also drive choice and preferences (Burgess, 2016). Companies invest a large portion of their budget in adverts, to promote and make the consumer aware of the existence of the product. One common tool used by marketers is to evoke a mental representation of the product by forcing ourselves to mentally pre-live the consumption situation. Advertising often tries to engage us into narrative stories to induce us to imagine the possibilities or benefits of using a product (instructed mental simulation-IMS). However, mental simulations may occur spontaneously/automatically and without people's awareness (Barsalou, 2008). Advertisements have the power to elicit mental simulations (MS) and influence preferences and attitudes (Elder & Krishna, 2012).

This research will address the key question: *how does being able to vividly imagine eating consumption events influences food product evaluation? Can an instructed mental simulation (i.e., asking people to simulate a certain event) contribute to focusing participants' visual attention in determine features of a packaging, and in turn affect people's expectation and preferences?* These questions contribute to explore these routes (process and outcome simulation) to understand the food decision-making, and to create strategies that help people to choose more according to their beliefs, without implying a cognitive effort.

We contribute to the literature on mental simulations and decision-making in at least three ways by empirically (1) identifying the efficacy of using process versus outcome mental simulation to impact product evaluations and choice probability (2) identifying moderators such as the health motivation and product category, (3) demonstrating that imagined experiences can influence attention focus, product evaluation, and preferences.

### Societal relevance

This research provides new insights in how to optimise product evaluation to impact choice through mental simulation. A better understanding of these drivers of choice will have immediate implications for research involving the sensory and marketing domain; public policy by highlighting the importance of improve the image of healthy foods to be as fun and tasty as unhealthy food.

Further knowledge in different simulations types may have important implication for understanding how we represent food in our mind as well as for the development of effective communication interventions of healthy food.

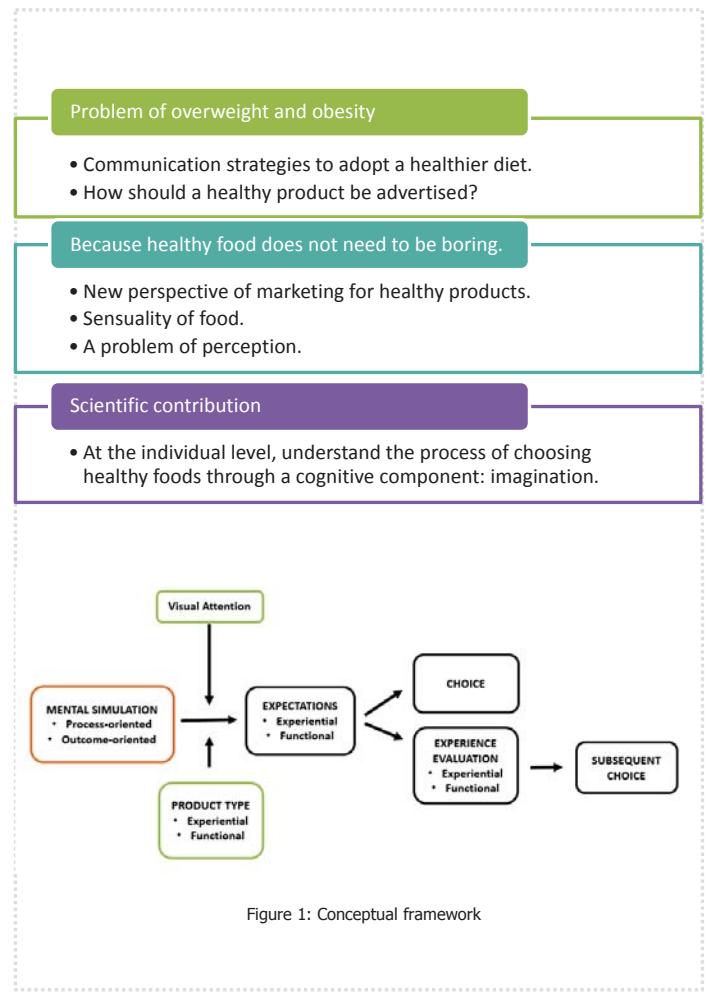


Figure 1: Conceptual framework

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- Morewedge, C. K., Huh, Y. E., & Vosgerau, J. (2010). Thought for Food : Imagined consumption reduces actual consumption, 330(December).
- Xie, H., Minton, E. A., & Kahle, L. R. (2016). Cake or fruit? Influencing healthy food choice through the interaction of automatic and instructed mental simulation. *Marketing Letters*, 1–18.
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# Rail Maintenance Operations in Regional Railways

## Case study line Brașov to Zărnești in Romania

A methodology to facilitate the maintenance decision making in regional railways is proposed. Using a train in operation (with passengers onboard), we capture the condition of the rails using Axle Box Acceleration (ABA) measurements. Then, using Hilbert-Huang Transform, the locations where the major risks are detected and assessed with a degradation model. Multiobjective optimization is employed to solve the maintenance decision problem, and to facilitate the visualization of the trade-offs between number of interventions and performance.

Se propone una metodología para facilitar la toma de decisiones en el mantenimiento de rieles en ferrovías regionales. Usando un tren en operación (con pasajeros a bordo), capturamos la condición de los rieles usando acelerómetros en el eje del tren. Luego, con la transformada Hilbert-Huang, los lugares donde hay mayor riesgo en el riel se detectan y evalúan. Optimización multi-objetivo se emplea para resolver el problema de decisión, y para facilitar visualización de soluciones Pareto óptimas para número de intervenciones (costos) y calidad de la ferrovía (desempeño).



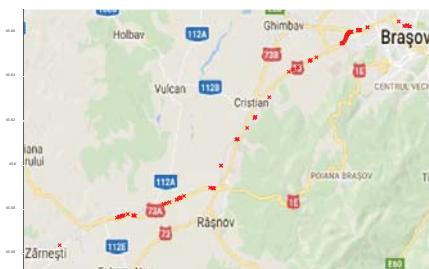
### Regional railways

Regional railway networks face many challenges for their daily operation. Two are the major affecting factors: (1) the low demand and (2) the dispersed population. As a consequence, often limited budget for operation and maintenance of the regional railway tracks is available. In this case, infra-managers must take well-informed decisions before performing inspections or maintenance, so to make the best out of the limited budget. Intelligent monitoring systems are widely used in the industry to control the degradation of the different railway assets. However, for regional railways, expensive equipment is usually unreachable due to the limited budget. Luckily, in recent years, sensor devices have become cheaper. Examples are in networking technologies, and different types of the cheap devices, like smart phones, accelerometers installed on trains and drone.

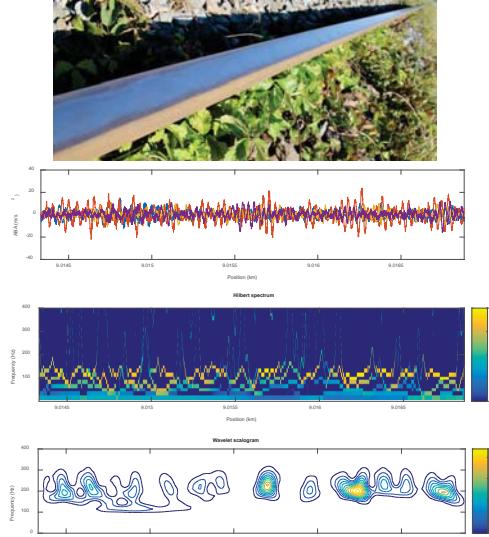
### Proposed approach

Rail condition should be kept controlled over time, to avoid defects and broken rails that might severely affect the safety of the operations. To decide which piece of rail requires maintenance and also which ones are the most critical pieces of the rail, we make use of Axle Box Acceleration (ABA) measurements that are able to detect the rail surface defects. By looking at the right features extracted from the acceleration data, location and severity of different types of defects can be obtained.

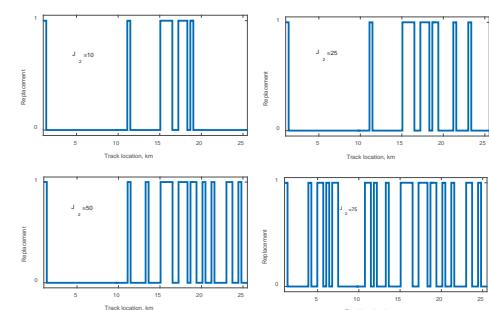
Based on performance indicators, we propose a methodology to use rail degradation model for a multi-objective maintenance decision support system. A scenario-based approach is considered to include the stochasticity of the rail damage evolution. A set of KPIs is defined according to the degradation over time. Using multi-objective optimization, the trade-offs between number of interventions and the effect on the performance is clearly observable. This will facilitate the decision making processes in regional railway, so that infra-manager can focus on those places with only the most relevant conditions.



**Fig. 1**  
Locations of the top 75 places where the ABA signal show largest energy variations.



**Fig. 2** Corrugation, ABA signals and their corresponding Hilbert spectrum and Wavelet scalogram.



**Fig. 3** Pareto solutions for different number of interventions. Value one is for those pieces with maintenance activities, otherwise zero.

### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Z. Su, A. Jamshidi, A. Núñez, S. Baldi, and B. De Schutter, "Multi-level condition-based maintenance planning for railway infrastructures – A scenario-based chance-constrained approach". *Transportation Research Part C: Emerging technologies*, Volume 84, November 2017, Pages: 92-123. DOI: 10.1016/j.trc.2017.08.018
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# Diamond magnetometry for imaging stress responses

## Mapping Reactive Oxygen Species in the living cell



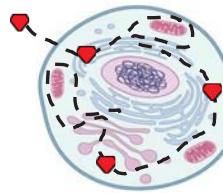
The Nitrogen-Vacancy centre is a point defect inserted in the diamond lattice which shows special magneto-optical properties. These properties enable us to detect and analyse, at nanometric scale, the magnetic noise produced by molecules on its near environment. We will use this information to monitoring the balance of Reactive Oxygen Species in cells, and from there to study the cell response to different stress agents.

El centro de Nitrógeno-Vacancia es un defecto en la red cristalina de los diamantes que presenta particulares propiedades magneto-ópticas. Estas propiedades permiten la detección y el análisis, a escala nanométrica, del ruido magnético producido por las moléculas que se encuentran en su entorno cercano. Nuestro objetivo es usar esta información para observar el balance de Especies Reactivas de Oxígeno en las células y desde ahí estudiar la respuesta celular a diferentes agentes promotores de stress.



### MOTIVATION

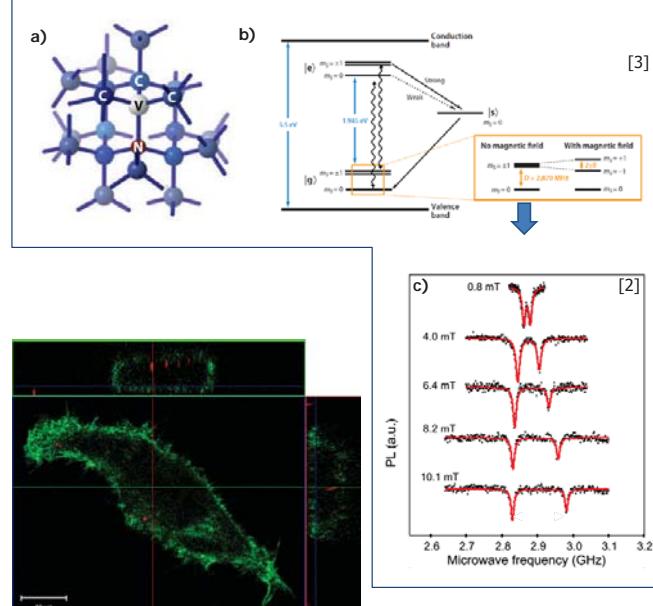
The excessive accumulation of **ROS** in the cell is related with **damages** on critical cell's components, such as DNA and proteins,<sup>[1]</sup> and it has being identified as a promoter in the pathogenesis of severe **illnesses**, such as cancer, diabetes mellitus and neurodegenerative diseases. In addition, ROS are also involved in the cell's **ageing** process. The **high reactivity** of the ROS makes difficult their study in real conditions, mainly because of their short lifespan. Under this circumstances, the use of **Diamond Magnetometry** is presented as a promising alternative to the current methods of detection and analysis of ROS. Using this technique, we expect to be able to detect ROS at **high spatial resolution**, in **real time** and at **physiological conditions**, but also to collect **spectral information** from this molecules. In this project, we are developing the **techniques** and **instruments** needed to make possible the detection and analysis of ROS inside living cells.



**The idea:** Nanodiamonds containing NV-centres are internalised by the cell. The magnetic noise is measured at different locations by means of Optically Detected Magnetic Resonance. The presence, amount and type of ROS are derived.

### BASIC PRINCIPLE

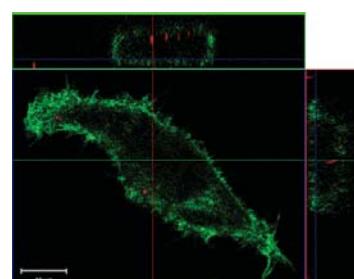
Diamond Magnetometry uses as a sensor a diamond crystal which contains a colour centre produced by the substitution of two adjacent carbon atoms with one nitrogen atom and a vacancy, this defect is called **NV-centre** (fig. a). When the NV-centre is excited (450–650 nm) it emits a **photoluminescent** signal (600–800 nm) which can be **modulated** by the action of a **magnetic field** (fig. c). The energy diagram of the NV-centre shows a spin triplet at ground state with zero field splitting of 2.87 [GHz] between the sublevels  $m_s=0$  and  $m_s=\pm 1$ . When an external magnetic field is applied, the sublevels  $m_s=\pm 1$  split apart, by means of the **Zeeman effect**, setting two different resonance frequencies (fig. b). In consequence, the strength of the magnetic field at the NV-centre position can be derived by measuring the gap between these two resonance frequencies.



### CURRENT WORKS AND NEXT STEPS

At this point, the project has build two instruments which are able to perform Electron Spin Resonance (ESR) measurements in living cells. Also, the experiments have shown that the nanodiamonds are basically **non-toxic** for cells. Moreover, the **particle internalisation** problem has been treated with different approaches, obtaining favourable results when the nanodiamonds are coated with a special recombinant protein (fig. d).

Nowadays, we are in process of upgrading the instrumentation with the objective of performing more sensitive measures (**T1 relaxometry**). On the other hand, we are investigating how to target the nanoparticles at specific places inside the cell.



d) HeLa cell showing nanodiamonds inside (HD=120nm). The particles were coated with the polymer-protein C<sub>4</sub>-K<sub>12</sub>.

### PROJECT INFORMATION

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### RELATED PUBLICATIONS

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3. R. Schirhagl et al., (2014) Nitrogen-Vacancy Centers in Diamond: Nanoscale Sensors for Physics and Biology, *Annu. Rev. Phys. Chem.*, vol. 65, no. 1.

# COOLFACADE

## Architectural integration of solar cooling systems in the building envelope

The necessity of lowering energy consumption from fossil fuels in the built environment demands us to take action on optimizing building systems currently under operation, while developing new technologies driven by renewable energy sources. This research project examines the feasibility of solar cooling façade integration for commercial buildings in warm climates as a response for the current scenario, while exploring further possibilities for the development of new architectural façade products.

La necesidad de reducir el consumo de combustibles fósiles en nuestras ciudades implica optimizar los sistemas actualmente en operación en edificios, mientras se exploran nuevas tecnologías basadas en energías renovables. Este proyecto busca examinar las posibilidades y barreras existentes para la integración de sistemas de refrigeración solar en fachadas para climas cálidos, como alternativa a los sistemas convencionales de aire acondicionado, además de ofrecer nuevas posibilidades para el desarrollo de productos arquitectónicos y diseño de fachadas.



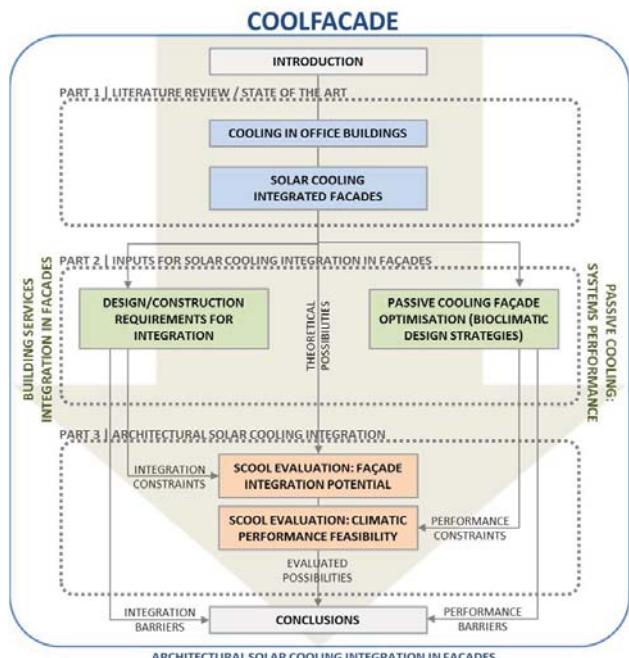
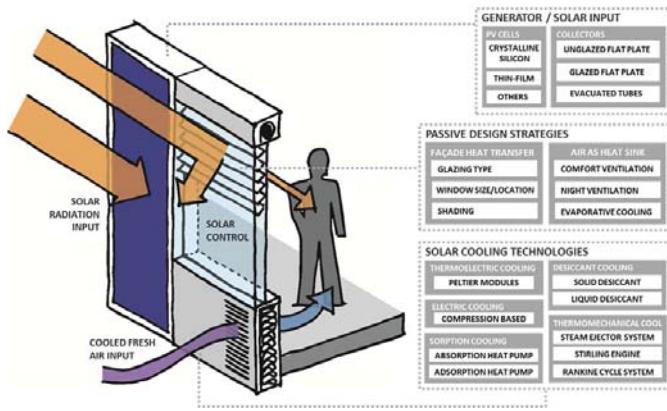
### RESEARCH DESCRIPTION

The energy utilised for the cooling of buildings is an important aspect of the current public agenda towards sustainability. Buildings account for almost a third of the global energy consumption, while studies show that refrigeration and air conditioning are responsible for about 15% of the total electricity consumption in the world. Solar cooling systems have been focus of attention these last years, for its potential to lower indoor temperatures using solar renewable energy. However, there is no much development regarding its architectural integration in buildings.

The research project deals with the integration of solar driven cooling strategies into the building façade, as a way to support the use of low-energy alternatives to the use of centralized AC in office buildings. Furthermore, the possibility of using the façade itself as a heat dissipation system is seen as an opportunity for the development of self-sustaining cooling façade modules to be applied either on new buildings or refurbishment projects, avoiding mechanical cooling equipment whatsoever in the line of new "nearly zero" energy standards.

The research project is structured in three parts: a first part for the definition of the framework and fundamental aspects; a second one for the exploration of different families of topics to be considered as design inputs; and finally a third part dealing with the evaluation of the integration potential of selected solar cooling technologies and the design of a façade concept to discuss current integration possibilities through feasible scenarios.

There are two main expected outcomes from the research project: a conceptual design and evaluation of a solar cooling façade concept for warm climates, and a roadmap for solar cooling façade product development considering current possibilities and constraints and future scenarios.



### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Prieto A, Knaack U, Klein T, Auer T. 25 Years of cooling research in office buildings: Review for the integration of cooling strategies into the building façade (1990–2014). *Renewable and Sustainable Energy Reviews*. 2017;71:89–102.
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# Cell Biology Master Student

## Medical and Pharmaceutical Drug Innovation

Since September 2016 I've been enrol in the Medical and Pharmaceutical Drug innovation (MPDI) master program in the University of Groningen. I decided for a master degree first, to make sure I really wanted to go into a PhD program afterwards and to explore my options. I have realized that cell biology and fundamental science is what I wanted and so I have decided to look for PhD position within Groningen and Europe in neurodegeneration and ageing.

Desde septiembre del 2016 estoy cursando el magister Medical and Pharmaceutical Drug Innovation (MPDI) en la universidad de Groningen. Me decidí a hacer un magister primero, para asegurarme de que realmente quería entrar a un doctorado y para explorar mis opciones. Me di cuenta de que biología celular y ciencia básica es lo que me motiva así que estoy buscando posición de doctorado en Groningen y Europa en general en neurodegeneración y envejecimiento.



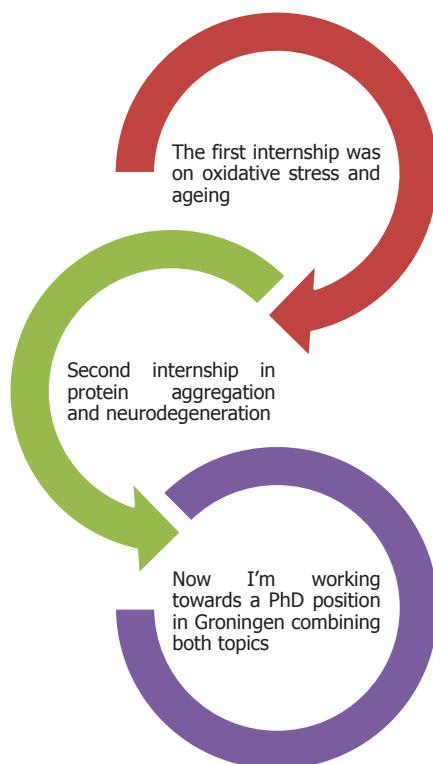
### My two internship within the master

My first internship was in the European Research Institute for the Biology of Ageing (ERIBA). And I worked setting up the protocol for detection of carbonylation of proteins of the nuclear pore complex (NPC). We worked in a yeast model, easy enough to manipulate and similar enough to the human NPC. At the end of the project we realized that oxidative stress causes changes in the proteins of the NPC and that leads to mislocalization of these proteins.

The implications of my first project hints to a dysregulation of the NPC, the channel that allows the traffic between cytoplasm and nucleus, which contributes to homeostasis instability and can contribute to neurodegeneration.

I'm currently working on my second project in the cell biology department in the University of Groningen and we are looking at protein aggregation in the context of neurodegenerative disease, Huntington disease model. Using HEK cell line we are looking at the contribution of chaperones, proteins in charge of correct protein folding, specially co-chaperones and their function to prevent aggregation.

At the end of my master we have to write a PhD position for one of our last classes and if the proposal is strong enough they can give a 3-years scholarship to do it. I'm currently under conversation with my supervisor to make it happen.



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# Facebook groups and academic preparation for the PSU

## The academic, instrumental and emotional utility of social media for Chilean youth

In Chile, the University Selection Test (PSU, Prueba de Selección Universitaria), is a standardized annual national test which defines entrance to university. The PSU selection system is run on a 'higher score, first served' basis, with slots filled with decimal points differences, generating sharp cut-offs (Hastings, Neilson, & Zimmerman, 2013). This system, together with the inequalities in academic preparation in Chile, make succeeding in this test a difficult endeavour for Chilean students.

In a series of interviews, the present study first analyzed the uses & gratifications obtained by Chilean youngsters when participating in a closed Facebook group about taking the Chilean equivalent to the U.S.'s SATs, the Prueba de Selección Universitaria (PSU).

In a second phase, a survey ( $N = 446$ ) gauged both the emotional and instrumental utility of using diverse social media during the test taking phase of the PSU.



### SAMPLE & METHODOLOGY

The first stage of the project consisted on 22 in-depth interviews were conducted all along Chile, (in 8 different regions). The sample was grouped in 3 zones, and considers the 3 different types of schools in each zone (private-paid, public and voucher schools).

Interviews were semi-structured with the following topics: main experiences during the PSU, main confidants, main expectations of results, career choice, sharing online about the PSU, helping others online with the PSU, participating in Facebook groups, use of other social media regarding the PSU.

On a second stage, 446 students located all around Chile answered a survey using experience sampling methodology, in which their social media usage was gauged, as well as their main sources of emotional and academic support.

### INTERVIEWS RESULTS

'Academic support'. Participants declared to use the Facebook group to improve their study skills by sharing study material with other members, and to help one another with test questions.

Stress release through humor. Participants stressed that the numerous jokes and memes regarding the test helped them mitigate their study pressure.

Information gain. Participants visited the group as an alternative information platform, searching for tricks and tips, particularly for those first-time testers.

Financial struggle. The PSU Facebook group was particularly useful for students who struggled to pay for academic preparation outside of their school.

### SURVEY RESULTS

Social media was an important source of obtaining both emotional support and practical information during the PSU. Students confided predominantly on their parents and close friends as support network.

On the day before the PSU, 60% of participants had used Facebook to either update their status (8.6%), writing direct messages (12%), participating in Facebook groups (20%), publishing pictures (2%), publish memes (10.7%), or to publish how they were feeling (5.7%). Only 10% of participants used Twitter to share emotions, 25% email, 28% Instagram, 2% Pinterest, 4.6% YouTube, 6% Skype, 6% blogs, and 0.3% fotolog.

An important means to share personal content related to the PSU was Whatsapp with 90% of participants stating they had used it to talk about the test. The highest type of usage (36.8%) was to participate in Whatsapp groups, followed by writing private messages (30%), updating their status (8.2%), and to express how they were feeling (10%).

Moreover, 86.8% of participants declared to have received feedback to their social media postings. In general, most participants declared that this feedback was satisfactory (70.50%), gave support (83%), advice (78.3%), showed empathy (82%), and made the sharer feel that they were listened to (77.5%). The most frequent feedback providers were friends (61.4%), classmates (37%), and family members (30%). Notably, 26.8% declared to have received feedback from strangers.



### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Rodriguez-Hidalgo, C., Tan, E. S., & Verlegh, P. W. (2017). Expressing emotions in blogs: The role of textual paralinguistic cues in online venting and social sharing posts. *Computers in Human Behavior*, 73, 638-649. DOI: [10.1016/j.chb.2017.04.007](https://doi.org/10.1016/j.chb.2017.04.007)
- Rodriguez Hidalgo, C. T., Tan, E. S. H., & Verlegh, P. W. J. (2015). *The social sharing of emotion (SSE) in online social networks: a case study in Live Journal*. *Computers in Human Behavior*, 52, 364-372. DOI: [10.1016/j.chb.2015.05.009](https://doi.org/10.1016/j.chb.2015.05.009)

# Endocrine regulation of fish reproduction:

## New opportunities for Chilean aquaculture industry

The production of viable gametes (egg and spermatozoa) is relevant to develop aquaculture system for new species. In our group, we study how the endocrine system modulates spermatogenesis, in particular the spermatogonial fate in zebrafish testis. Since Chilean aquaculture consists almost exclusively (90%) of salmon species production, understanding fish reproduction will help to develop aquaculture of new species and also improve salmon farming.

La producción de gametos viables es relevante para el desarrollo sistema de cultivo de nuevas especies. En nuestro grupo, estudiaremos como el sistema endocrino modula la generación de gametos masculinos (espermatogénesis), en particular el destino de las spermatogonias en testículos del pez cebra. Debido a que la acuicultura en Chile esta basada casi por completo en especies salmonidas (90%), el estudio de la reproducción de peces ayudara a el desarrollo de la acuicultura de nuevas especies y tambien ayudara a mejorar la acuicultura del salmón.



### The pituitary hormone Fsh stimulates spermatogenesis by regulating Igf family members

The increasing food demand and reduction of fishing stock have resulted in growing aquaculture production in the last years. In Chile, aquaculture has become one of the most important food industries; however, close to 90% of the total production consists of salmonids species. Therefore, the development of aquaculture system for other fish species is needed. The production of gametes (eggs and spermatozoa) is one of the key aspects to consider when introducing new species into aquaculture system

Sexual reproduction is by far the dominating mode of reproduction, although only half of the individuals (i.e. mothers) can produce offspring. The balance of this costly strategy is provided by the evolutionary advantage of the genetic recombination during meiosis in combination with sexual selection that exerts its pressure predominantly on males. Males produce thousands of haploid spermatozoa, highly specialized cells functioning as motile genome vectors, in a event denominated spermatogenesis. Spermatogenesis is a cellular developmental process that requires complex regulatory mechanisms. The cellular basis of spermatogenesis is a population of spermatogonial stem cells (SSCs), usually present as single cells in close contact with somatic cells. SSCs can either be quiescent, self-renew to produce more SSCs, or differentiate into subsequent developmental stages to eventually produce spermatozoa. In order to sustain spermatogenesis, a balance between self-renewal and differentiation is required.

The endocrine system have evolved as the major regulator of these complex processes. The pituitary hormone Follicle-stimulating hormone (Fsh) regulates the activity of somatic cells in gonads, which then communicate with germ cells via short-range signaling. Nevertheless, the information available on the short-range communication systems involved in mediating Fsh effects is limited. Using male zebrafish as a fish model, we discovered that Fsh stimulates both self-renewal and differentiation of spermatogonia, a critical process to maintain testis tissue homeostasis throughout adult life.

In my project, I studied how Fsh makes use of members of Igf signalling system to stimulate self-renewal/differentiation of spermatogonia in zebrafish testis.

Figure 1. Fish model used in this project

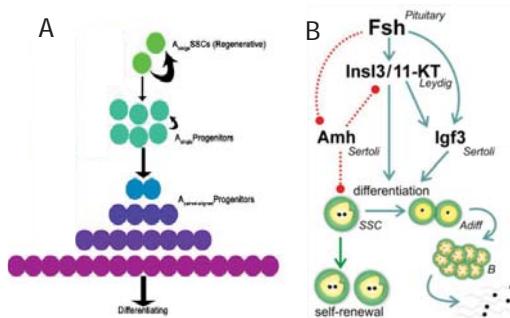
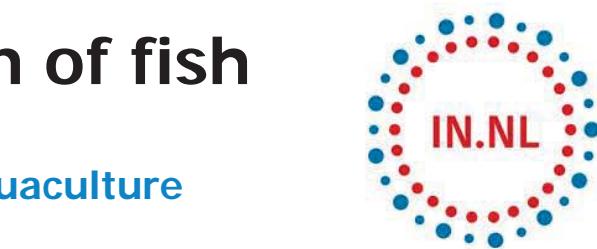


Figure 2. (A) The balance between self-renewal and differentiation of spermatogonial stem cells and (B) endocrine regulation of zebrafish spermatogenesis.

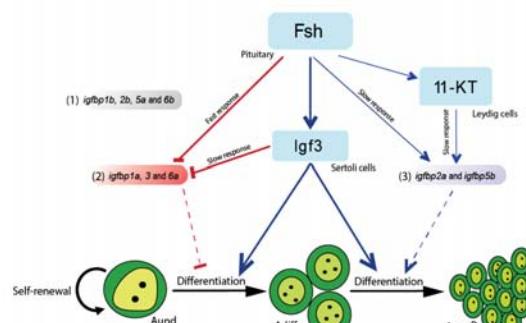


Figure 3. Schematic representation of the effects of Fsh and two downstream mediators, Igf3 and 11-KT, on *igfbp* transcript levels and potential roles of Igfbps in adult zebrafish testis.

### PROJECT INFORMATION

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### RELATED PUBLICATIONS

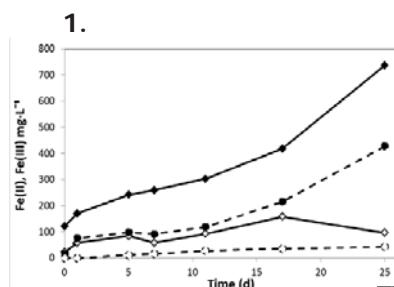
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- Crespo et al., (2016). *Molecular and Cellular Endocrinology*. 437:237-251
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- Safian et al., (2017). *Frontier in Endocrinology*. 8:328; doi: 10.3389/fendo.2017.00328

# Bioscorodite crystallization for safe arsenic removal in metallurgical streams

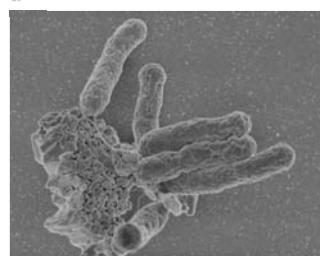
Silvia Vega Hernandez

Arsenic is a major contaminant in the metallurgical industry released during industrial operations. As it cannot be longer commercialized, a safe-long term disposal is needed. For this purpose, the removal of Arsenic in the stable and compact crystal Scorodite ( $\text{FeAsO}_4 \cdot 2\text{H}_2\text{O}$ ) is the best option. Here, we have demonstrated that scorodite can be biologically formed by thermoacidophilic ferrous ( $\text{Fe}^{2+}$ ) oxidizing bacteria. Therefore, we coupled bioleaching of ferrous mineral (pyrite) with the removal of arsenite ( $\text{As}^{3+}$  at high temperature (70°C) in presence of air which greatly reduce the cost of and oxidant in the process.

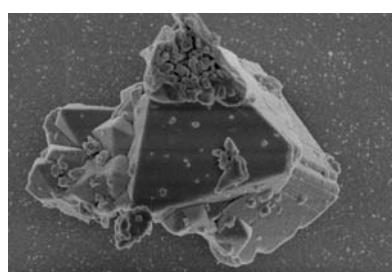
Arsenico es un metal tóxico generado en altas concentraciones durante el procesamiento metalúrgico. Su impacto negativo en la recuperación de valiosos metales como cobre y en el medio ambiente hace necesaria forma de almacenamiento estable y a largo plazo. Para este propósito la precipitación de cristales de arsenato férrico (Escorodita) es la mejor opción. Este estudio propone la precipitación de escorodita mediada por microorganismos acoplado a lixiviación de pirita. A través de este proceso se ha logrado la reducción de costos relacionado al uso de químicos y generación de desechos además de la remoción del 85% de arsénico de los effluentes de mina en forma de un pequeño cristal ( $<10\mu\text{m}$ ) que permite un menor manejo de los residuos mineros.



1. Oxidation of  $\text{Fe}^{2+}$  (filled symbol) to  $\text{Fe}^{3+}$  (empty symbol) in presence (solid line) and absence (dashed line) of thermophilic mixed culture.

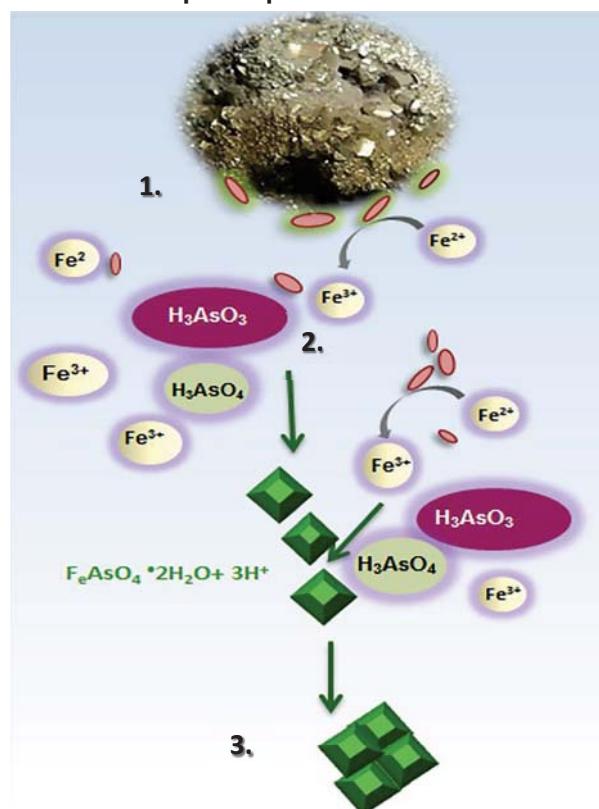


2. Biological mediates the precipitation.  
SEM pictures of the microorganisms (genus bacillus) attached to the minerals



3. Crystalline precipitates.  
SEM picture of crystalline BiOscorodite obtained in the process.

Schematic representation of  $\text{As}^{3+}$  oxidation and bioscorodite precipitation



## Conclusion.

The precipitation of crystalline scorodite is mediated by microorganisms since precipitates were not found in chemical controls.

### PROJECT INFORMATION

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### RELATED PUBLICATIONS:

Vega, Silvia, Jan Weijma, and Cees NJ Buisman. "Immobilization of Arsenic by a Thermoacidophilic Mixed Culture with Pyrite as Energy Source." *Solid State Phenomena*. Vol. 262. Trans Tech Publications, 2017.

# Managing Social Condominiums

## The role of third sector organisations in housing improvement and maintenance for Chilean homeowners

This research project focuses on the intermediary role of social enterprises in providing support, skills and building capacity among communities to improve management processes and to address quality in the built environment. The main goal is to show the possibilities and constraints of the intermediary role of third sector organisations in condominium management models for Chilean low-income homeowners.

Este proyecto de investigación se enfoca en el rol del tercer sector, y especialmente las empresas sociales, en la gestión habitacional, a través del apoyo social, técnico y organizacional a las comunidades para mejorar la mantención y administración de sus viviendas. El principal objetivo es mostrar las posibilidades y limitaciones de modelos alternativos para la gestión de condominios sociales.



### DESCRIPTION

Low-income homeowners face important challenges regarding housing management. In the case of condominium tenure, homeowners have a double challenge; besides the financial constraints of providing technical maintenance to each dwelling, they have to organise the management of the common areas. The case of Chile is illustrative regarding the challenges of a "homeownership society" in which housing policies have encouraged ownership among the poorest population. After thirty years of operation, the affordable housing stock and its neighbourhoods present high levels of deterioration and devaluation. Moreover, Current Government subsidies are not able to cope with the high amount of dwellings and fail to provide a sustainable solution in the long-term.

Therefore, it is important to develop alternative management models to improve and maintain the condominiums, providing technical, organisational and social support to homeowners from a bottom-up approach. Understanding the relevance of external action to improve management processes among vulnerable households, this research explores the intermediary role of the third sector in providing support, skills and building capacity among communities to improve management processes and to address quality in the built environment.



### RESEARCH OUTLINE

#### 1. CONCEPTUALISATION

LOW-INCOME HOMEOWNERSHIP | CONDOMINIUM MANAGEMENT

THIRD SECTOR AS INTERMEDIARY

- Definition of problem variables of condominium management in Chile.
- Analytical model for condominium interventions.

#### 2. ANALYSIS

CASE STUDY ANALYSIS, METHODS AND APPROACHES

LOCAL CASE

INTERNATIONAL CASES

- Database of international and local practices of third sector organisations.
- In-depth analysis of three selected cases.
- Adapted lessons.

LESSON-DRAWING AND TRANSFERABILITY

#### 3. SYNTHESIS & PROPOSAL

DEFINITION OF ROLES AND VALIDATION

COURSE OF ACTIONS FOR ALTERNATIVE ROLES

- Definition of possibilities and identification of constraints for the role of third sector organisations in condominium management.
- Guidelines for alternative roles.

### PROJECT INFORMATION

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### RELATED PUBLICATIONS

- Vergara d'Alenccon, L. M., Gruis, V., & Van der Flier, K. (2016). The intermediary role of social enterprises in the management of affordable condominiums. Evidence from a Chilean case study. ENHR Conference 2016. Belfast, Northern Ireland, 28 June - 1 July 2016.

- Vergara d'Alenccon, L. M. (2016). Gestión de la Vivienda Social. Hechos, desafíos y campos de acción. Revista CA. Ciudad y Arquitectura, 152.



# Redes Chilenas

## Trabajando en unidad para un mejor futuro científico en Chile

RECH is the Chilean Networks Association. RECH is comprised of 14 networks of Chilean researchers throughout the world. At RECH, we intend to promote changes to the Chilean scientific institution by working towards strengthening the investment in science, supporting the generation of the Ministry of Science and Technology and improving the conditions of Becas Chile for scholarship recipients, among other goals. We hope to get to the non scientific Chilean population by communicating what we do and how to achieve our goals.

RECH es una plataforma que agrupa distintas redes de investigadores Chilenos a lo largo del mundo y busca promover cambios en Chile en pos de mejorar la institucionalidad científica Chilena. Actualmente participan 14 redes y estamos en contacto con diversas instituciones para mejorar la conectividad de la comunidad científica tanto en Chile como en el exterior con la sociedad Chilena. Estamos en trabajo constante para mejorar las condiciones de los becarios CONICYT así como aumentar la inversión en ciencia y tecnología entre otros proyectos.



### QUIÉNES SOMOS RECH?

ReCh es una plataforma que aúna 14 redes de investigadores tanto en Chile como en el mundo y esta compuesta por más de 2000 investigadores desempeñándose en diversas áreas del conocimiento. Provenimos desde las humanidades, ciencias sociales, ciencias básicas y aplicadas.

ReCh nace frente a la necesidad de articular una voz y una visión común frente al desarrollo de la actividad científica presente y futura del país. Para ello, se estableció una organización de trabajo (figura 1) que respeta la autonomía de las asociaciones miembros pero que evita burocracia innecesaria para así lograr consenso y buen criterio en la toma de decisiones. En la práctica, se busca generar un mecanismo de coordinación y decisión eficiente y efectivo, que permita la discusión abierta y respetuosa entre todas las asociaciones miembros de ReCh.

Tenemos la voluntad de promover los cambios que la institucionalidad científica chilena necesita, desde la creación del Ministerio de Ciencia y Tecnología, el incremento de los recursos basales para Investigación, hasta la mejora de las condiciones contractuales y becas. También esperamos contar con el apoyo de la comunidad no científica haciendo difusión de nuestro trabajo como RECH y como investigadores.

### LAS REDES PARTICIPANTES

Las redes participantes de RECH son las siguientes y se puede observar los logos de cada una de ellas en la figura 2.

1. ANIP
2. Más Ciencia para Chile
3. Nexus Chile-USA
4. Red de Investigadores/as Chilenos/as en España (Red INCHE)
5. ICES (Investigadores Chilenos en Suiza)
6. CHISA@UNSW Australia
7. Asociación de Investigadores y Estudiantes Chilenos en Wageningen (AIECh)
8. CREGA-Melbourne
9. REDICEC (Red de investigadores Chilenos en Canadá)
10. UoMCs, Universidad de Manchester
11. ChileUCDavis
12. Red de Investigadores Chilenos en los Países Bajos (InNL)
13. UO Chile Australia
14. Chileberk (UC Berkeley)

### COMISIONES DE TRABAJO

1. Comunicaciones
2. Becas
3. Inserción de investigadores
4. Mecanismos de retribución Becas Chile
5. Inversión en Investigación en Chile
6. Ministerio de Ciencia y Tecnología

**Si quieres trabajar con nosotros por favor no dudes en contáctarnos a [contacto@redeschilenas.cl](mailto:contacto@redeschilenas.cl).**

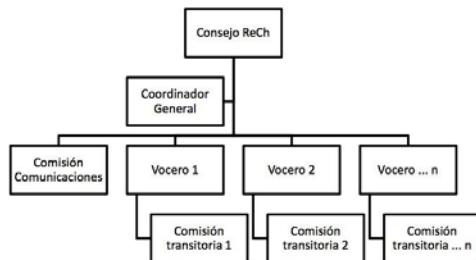


Figura 1: Estructura organizacional de trabajo en RECH



Figura 2: Logos de redes participantes en RECH



Figura 3: Mapa de la cobertura de RECH en el mundo

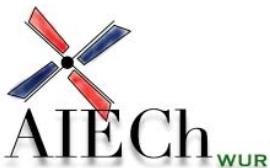
### PROJECT INFORMATION

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Si te gustaría tener mas información o sumarte al trabajo de RECH, contáctanos en nuestras redes sociales o a nuestro mail [contacto@redeschilenas.cl](mailto:contacto@redeschilenas.cl).

# Asociación de Investigadores y Estudiantes Chilenos (AIECh)

Chilean Student Association in Wageningen University



WAGENINGEN  
UNIVERSITY & RESEARCH



**MOTIVACIÓN:** necesidad de contar con una asociación establecida, que represente los intereses de los investigadores y estudiantes chilenos/relacionados con Chile en Wageningen University & Research.

**OBJETIVOS:** a) promover y facilitar la interacción e integración social, b) difundir las investigaciones y c) desarrollar una red de cooperación e intercambio científico.

**MOTIVATION:** the need to rely on an established association in order to represent the interests of Chilean researchers and students, and any other actor related with Chile and Wageningen University & Research.

**OBJECTIVES:** a) to promote and facilitate the social interaction and integration, b) to disseminate the research outcomes and c) to develop a collaborative network for scientific exchange.



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