UAB
Universitat Autònoma de Barcelona

Animal Production

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Alex Clop & Alicia Roque	CSIC researcher at CRAG; Professora Titutalr d'Universitat (D. Bioquimica i Biologia Molecular)	c/ Vall Moronta sn, edifici crag. Campus UAB. Facultat de Biociencies Campus UAB	alex.clop@cragenomica.es; alicia.roque@uab.cat	Animal Production	Dept of Animal Sciences and food technology	genomics tools to identify variants affecting male reproduction traits in swine.	We are carrying whole genome sequencing and single cell multiome (RNA + ATAC) sequencing of the pig testicle in (i) boars with opposite performance for sperm quality and (ii) boars with a novel case of azoospermia and unaffected controls. With this approach, we will identify DNA variants displaying allelic frequeny differences between the boars with opposite semen quality (i) and being only present or recessive in azoospermic animals (ii). The single cell multiome data will be used to identify gene expression or genome accessibiity differences between groups for (i) and for (ii). A selection of candidate variants will be then used in a genetic association study for severral boar reproduction traits in near 1000 boars from dfferent genetic backgrounds. We will also study the genetic basis of sperm capacitation and will also develop a deconvolution model to predict single cell transcriptomes from. bulk testicle tissue RNA-seq..
Gerardo Caja	Catedratic emerit	Ruminant Research Group (G2R), Department of Animal and Food Sciences, Edifici V, Campus universitari, Universitat Autònoma de Barcelona, 08193 Bellaterra (Spain)	gerardo.caja@uab.cat	Animal Production	Animal and Food Sciences	Management and welfare	Project TechCare: it is a multi-actor project using innovative precision technologies to improve welfare management in sheep and goats systems. The research developed in the UAB group focus on dairy sheep and goats in experimental and large scale commercial farms. The project is funded by the EU H2020 programme (Grant agreement no. 862050).
Roser Sala Pallarés	Assistant Professor (Profesor Titular de Universidad)	Veterinay Medicine Faculty, Universitat Autònoma de Barcelona (Bellaterra, Barcelona, Spain)	roser.sala@uab.cat	Animal Production	Animal and Food Science	Fats in monogastric animals: Nutritional evaluation	To investigate the potential use of fat by-products rich in Medium Chain Fatty Acids in fish feeding and their repercussions in terms of nutritive value (digestion/ absortion), gut health and productive performances. The specific objectives are: 1) to determine how the different composition (fatty acid profile; and structure; %Triacylglycerols and Free fatty acids) of the ingredients rich in MCFA affects their utilization by the fish studying the dynamic of digestion and absorption, 2) to test the effects of the different MCFA sources on gut health, including microbial balance and intestinal histomorphology; 3) to establish the best nutritional strategy for their supplementation in feeding programs of fish in order to obtain a high palatability of feeds, nutrient utilization efficiency and positive gut environment.
Susana M. Martín-Orúe	Full Professor	Travessera dels turons s/n. Facultat de Veterinària. Campus UAB. 08193 Bellaterra. Barcelona. Spain	susana.martin@uab.cat	Animal Production	Animal and Food Science Departament	Nutrition and feeding of monogastrics (pigs, poultry, fish)	Slow growing piglets are particularly relevant for the pig industry in terms of welfare and economic sustainability. Numerous and interdependent factors could be the origin for this variable performance, but previous studies have evidenced that the early gut microbiota and post-weaning feeding behaviour could have a pivotal role. In the present proposal, we will explore these main drivers conditioning performance of low efficient piglets, with a particular focus on the gut-brain axis and its possible role in the adaptation of piglets to dry feed. Using in vivo and in vitro models, the project will aim to test differences in the structure and responsiveness of gut microbiota between low and high thriving piglets and also to evaluate the potential of different biotic strategies to improve the response of poor performing individua.

Animal and Food Science

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Manuel Castillo Zambudio	Professor	08193 Bellaterra (Cerdanyola del Vallès), Barcelona	Manuel.Castillo@uab.cat	Animal and Food Science	Department of Animal and Food Science UAB	Forecast the shelf life of dairy products based on this technology	We plan to investigate spectral techniques to develop predictive models to forecast the shelf life of dairy products under different sterilization conditions. Utilizing optical sensor technology can facilitate non-destructive and swift prediction of dairy product shelf life, thus saving testing time and promoting innovative product development for swift market entry.

Animal Medicine and Health

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Alberto Allepuz	Profesor Agregado	Edifici V, Travessera dels Turons, 08193 Cerdanyola del Vallès, Barcelona	alberto.allepuz@uab.cat	Animal Medicine and Health	Animal Health adn Anatomy	Animal Health, Infectious Diseases and Veterinary Epidemiology	Development and application of models to understand the effect of preventive measures in the spread of pathogens in farmed animals
Martí Cortey Marquès	Professor Agregat	Edifici V, Travessera dels Turons, 08193 Cerdanyola del Vallès, Barcelona	marti.cortey@uab.cat	Animal Medicine and Health	Animal Health adn Anatomy	Animal Health, Infectious Diseases and Veterinary Epidemiology	Evaluation of the role of the microbiota in the development of the immune response after vaccination, using pigs as animal model

Enrique M Mateu de Antonio	Professor	Veterinary Faculty, Travessera dels Turons s/n, campus UAB, 08193 Cerdanyola del Vallès, Spain	enric.mateu@uab.cat	Animal Medicine and Health	Dep. Animal Health and Anatomy	Research on transmissible diseases	Assessment of the risk associated to different routes of transmission for relevant pathogens of pigs (PRRSV, Influenza, etc.)

Aquaculture

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Mariana Teles Pereira	Ramon y Cajal Researcher	Universitat Autònoma de Barcelona	mariana.teles@uab.cat	Aquaculture	Department of Cellular Biology, Physiology and Immunology	Emergent contaminants: a new and global threat to fish health	The PhD plan will be related with the study of the interplay between the most important climate change drivers in the aquatic environment, such as temperature and the contamination by nanoplastics. Also interactions between chronic exposures to nanoplastics and increases in temperature and the potential effects that those stressors can have in posterior challenges typically occurring under aquaculture conditions (e.g fish vaccination, transport) will be assessed. Preference will be posed on the use of non-invease biomarkers in order to decrease animal sacrifice which is in accordance of the 3R on the reduction of animals for experimental purposes. We will also give preferences to the use of automated analysers for the measurement of biomarkers.
Nerea Roher Armentia	Associate Professor	Institut de Biotecnologia i Biomedicina, Campus UAB	nerea.roher@uab.cat	Aquaculture	Cell Biology, Animal Physiology and Immunology	Stress, Immunology and Vaccine development	Development of novel subunit vaccines for fish viral diseases (SAV, IHNV and White spot)

Biochemistry, Molecular Biology and Biomedicine

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
José Manuel López Blanco	Associate Professor	Unitat de Bioquímica, Facultad de Medicina, Universitat Autónoma de Barcelona.	josemanuel.lopez@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Bioquímica clínica, patologia molecular i farmacologia	Alterations in Neronal Stem Cells (NSC) and Pluripotent Stem Cells (iPSC) obtained from Lesch-Nyhan patients. Lesch-Nyhan disease (LND) is caused by a deficiency in the purine metabolism and is characterized by severe neurological manifestations. Neuronal Stem Cells and Pluripotent Stem Cells obtained from LND patients will be culture with physiological media to mimic in vivo conditions. We will asses wether these cells present biochemical and/or functional alterations, and if the differentiation program into different cell types is compromised.
Jordi Moreno Romero	Ramon y Cajal Fellow	Faculty of Biosciences, Building C	jordi.moreno.romero@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Department of Biochemistry an Molecular Biology	Gene regulation, structure and function of macromolecules	The group's research focuses on how plants adapt to changes in their environment through epigenetic regulation. When the environment changes, the structure of chromatin, which is found in the cell nucleus, also changes. Epigenetic marks, such as DNA methylation and histone modifications, play a crucial role in altering chromatin structure and determining whether genes are turned on or off. In the study of how plants respond to environmental cues, DNA methylation has been extensively researched, while histone modifications are gaining attention but are not fully understood. This PhD project aims to investigate the role of a specific histone modification, tri-methylation of lysine 27 on histone H3 (H3K27me3), in how plants adapt to environmental cues. The group has discovered that H3K27me3 levels are important for regulating genes involved in light response. However, the exact mechanisms linking signaling and epigenetic control of gene activity are still unknown. Using advanced molecular biology techniques, including transcriptomics, epigenomics, and proteomics, the project aims to uncover the relationship between transcription factors, chromatin remodelers, and histone marks that control gene expression in response to environmental changes.
Salvador Ventura	Full Professor in Biochemistry and Molecular Biology	Institute of Biotechnology and Biomedicine Parc de Recerca UAB, Mòdul B Universitat Autònoma de Barcelona E-08193 Bellaterra (Barcelona)	salvador.ventura@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Institute of Biotechnology and Biomedicine/Department of Biochemistry, Molecular Biology	Gene regulation, structure and function of macromolecules	A structurally designed self-assembling mRNA vaccine to treat Parkinson's Disease. Webpage: Finding a truly effective treatment for Parkinson's disease – that goes beyond simply managing symptoms – has long been a challenging task and, to this day, there are no available therapeutic options that can effectively slow or stop the underlying disease. However, research and trials to find treatments are ongoing. In this project, we leverage our recent breakthrough involving the identification of a crucial epitope essential for a-synuclein aggregation—the root cause of the cerebral pathology- to structurally design and characterize a novel mRNA vaccine that, upon self-assembly in humans, can stop the development of the disease. https://ibb.uab.cat @PPMC_UAB Reference articles: Santos et al. doi: 10.1016/j.tibs.2022.02.001. Santos et al. doi: 10.1038/s41467-021-24039-2.
Jaume Farrés	Full Professor	Unitat de Bioquímica de Biociències- Facultat de Biociències - Edifici Cs · C2/325 · carrer de la Vall Moronta - 08193 Bellaterra (Barcelona) Spain	jaume.farres@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and molecular biology	Gene Regulation, Structure and Function of Macromolecules	Development of enzyme inhibitors as new pharmacological agents against cancer disease

ALEX PERALVAREZ-MARIN	Associate Professor	Biophysics Unit / Department of Biochemistry and Molecular Biology / Institute of Neurosciences Schol of Medicine	alex.peralvarez@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology / Institute if Neurosciences	Membrane Disruptive Peptides as a tool for cargo delivery (CPP), pore formation and antimicrobial potential	Using Biophysics, Cell biology, and computational methods, we will design multipupose peptides with antimicrobial, antiamyloid or cell penetrating potential towards diagnose, therapy and biotechnology use.
Ana Paula Candiota	Associate Professor	Biochemistry and Molecular Biology Department / Biosciences Faculti. Edifici Cs Campus UAB	AnaPaula.Candiota@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Molecular biophysics and application to medicine	Magnetic resonance based follow-up of therapy response in preclinical brain tumours: relationship with tumor microenvironment
Joaquin Ariño	Full Professor & PI	Ed. IBB, Campus UAB, Cerdanyola del Vallès, Barcelona, Spain	joaquin.arino@uab.es	Biochemistry, Molecular Biology and Biomedicine	Institut of Biotechnology & Biomedicine, and Dept. Biochemisry & Molecular Biology	Novel alkaline pH-regulatable promoters in *Pichia pastoris* for protein production: Design, construction and optimization	The yeast *P. pastoris* is a very important host for production of recombinant proteins of industrial interest. Currently, most protein are expressed using the *AOX1* promoter. In spite of its advantages, it involves the use of methanol, a flammable and toxic compound whose metabolism has other disadvantages. Therefore, large efforts are invested in finding suitable alternative expression systems for *Pichia*. We have identified and tested a set of promoters that are finely regulated by alkalinization and suitable for heterologous protein expression. This proposal aims to bring the selected alkaline-inducible strains to the bioreactor level for production of different enzymes of industrial interest, such as phytases or lipases, as well as to elucidate, by transcriptomic analysis, the signaling pathways controlling alkaline pH-controlled gene regulation. The identification of specific transcription factor-binding genomic elements will allow the generation of synthetic hybrid promoters with improved capabilities.
Jose Miguel Lizcano de Vega	Catedràtic Laboral (UAB)	Departmanet de Bioquímica, Facultat de Medicina. Campus UAB, Bellaterra (Barcelona)	josemiguel.lizcano@uab.cat	Biochemistry, Molecular Biology and Biomedicine	UAB Dept. of Biochemistry and Molecular Biology, and VHIR Research Instiute	Protein Kinases and Cellular Signaling in cardiomyocite aging	Cellular singaling pathways driven by protein kinases are involved in all the processes within the cell. MAP kinases, and specifically MAP kinase ERK5, are key players in the pathophysiology of cardiomyocytes. Among others, classical MAPKs and ERK5 are involved in age related cardiomyocyte hypertrophy, are activated by the Advanced glycation endproducts (AGEs), and promote cellular senescence.
Marc Torrent Burgas	Associate Professor	Biosciences Faculty, Buiding C, Dept. Biochemistry and Molecular Biology	marc.torrent@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Structure and Function of Macromolecules	Search of new antimicrobials against multidrug resistant bacteria. Our research lines focuses on the discovery of new antibiotics and adjuvants that target the pathogen-host interactome. More information on the group webpage: https://sites.google.com/site/marctorrentburgas/

Bioinformatics

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
ALEX PERALVAREZ-MARIN	Associate Professor	Biophysics Unit / Department of Biochemistry and Molecular Biology / Institute of Neurosciences Schol of Medicine	alex.peralvarez@uab.cat	Bioinformatics	Biochemistry and Molecular Biology / Institute if Neurosciences	Cannabidiol and in silico drug discovery	Cannabidiol is a multitarget drug. Using computational Biophysics, we will assess the putative binding sites of Cannabidiol in several integral membrane targets relevant for human pathophysiology.
Miquel Angel Senar	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	miquelangel.senar@uab.cat	Bioinformatics	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	This topic focuses on the study of methods to assess the relative abundance of species in complex genomic samples. Starting from traditional methods (metabarcoding, metagenomics), their limitations are analyzed and new approaches are designed and evaluated to achieve better results in terms of accuracy and performance.
Josep Piñol	Catedràtic d'Universitat	Carrer dels Til·lers. Edifici C.Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	josep.pinol@uab.cat	Bioinformatics	Animal Biology, Plant Biology and Ecology	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	This topic focuses on the study of methods to assess the relative abundance of species in complex genomic samples. Starting from traditional methods (metabarcoding, metagenomics), their limitations are analyzed and new approaches are designed and evaluated to achieve better results in terms of accuracy and performance.
Margarida Julià-Sapé	Senior Lecturer	Biochemistry Department, Biosciences faculty	Margarita.Julia@uab.cat	Bioinformatics	Biochemistry Department, Biosciences faculty	Omics and Molecular Bioinformatics	Machine learning coupled to magnetic resonance spectroscopy data of brain tumours- biomarker discovery for prognostic stratification of patients with glioblastoma
Xavier Daura Ribera	ICREA Research Professor / UAB Adjunct Professor	Edifici MRB, Campus de la UAB	xavier.daura@uab.cat	Bioinformatics	Institut of Biotechnology and Biomedicine (IBB)	Structural Bioinformatics and Pharmacoinformatics	Molecular mechanics of allosterism: understanding the physics of allosteric effects in proteins through computational modelling and simulation.

Biotechnology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Anna Laromaine (ICMAB-CSIC) & Natalia Sanchez de Groot (Tutora UAB)	Cientifica Titular ICMAB / Ramón y Cajal Investigator UAB	Institut Ciencia de Materials de Barcelona- Campus UAB	alaromaine@icmab.es	Advanced Biotechnology	Institut Ciencia de Materials de Barcelona-Campus UAB	Biomaterials and C. elegans	Project title: Small organism as a model to evaluate external environmental factors Project background: We use the 1 mm-long nematode Caenorhabditis elegans as an animal model to test the toxicity of the materials and drugs. This worm has transparency, a short life cycle, and minimal maintenance and growth requirements. Between 60-80% of the C. elegans genome has human homologous genes, and most metabolic pathways are also conserved. Using simple non-mammalian model organisms minimizes the cost associated with in vivo experiments in the early stages of discovery and yields highly informative results such as survival rate, growth effects, reproduction toxicity, and changes in metabolism. We have studied how nanoparticles are uptaken by the worms and evaluated developmental parameters for nanoparticles, metal-organic frameworks, and even complex chemical clusters. (Ref below) We are currently evaluating different stimuli, drugs, and nanoparticles in collaboration with different research groups, which will impact our understanding of diseases or human health. This project will evaluate C. elegans exposed to nutritional materials, drugs and external stimuli such as electromagnetic fields could drive specific effects on oxidative stress, development on in specific organs/ functions such as cardiac arrhythmias and metabolic health. We will challenge the C. elegans to answer complex and combined questions i.e. in the cardiotoxicity and metabolism fields. Team: The work will be carried out at the Nanoparticles and Nanocomposite Group (www.icmab.es/nn) at the Materials Science Institute of Barcelona (www.icmab.es) within the framework of the European project, NEXTGEM project and SGR project. The center and our university environment in the UAB, BNC cluster, and Barcelona city provide many opportunities for complementary training in transferable skills (communication, entrepreneurship, ...) that will expand the candidate's interdisciplinary experience. Collaboration with complementary groups and short research stages in other centers are envisaged. References Pushing the limits on the intestinal crossing of Metal-Organic Frameworks: an ex vivo and in vivo detailed study, ACS Nano 2022, 16, 4, 5830–5838, Sara Rojas, Tania Hidalgo, Zhongrui Luo, David Ávila, Anna Laromaine*, and Patricia Horcajada* Arrhytmic Effects Evaluated on Caernorhabditis elegans: The case of polypyrrole nanoparticles S. Y. Srinivasan; P. Alvarez Illera; D. Kukhtar; N. Benseny-Cases; J. Cerón; J. Álvarez; R. I. Fonteriz; M. Montero; A. Laromaine, ACS Nano 2023 10.1021/acsnano.3c05245 . Toxicogenomics of iron oxide nanoparticles in the nematode C. elegans L. Gonzalez-Moragas, Si-Ming Yu , N. Benseny-Cases, S. Sturzenbaum , A. Roig, A. Laromaine*, Nanotoxicology., 2017,11,5, 647-657.
Gregorio Álvaro Campos	Associate Professor	Engineering School, Campus UAB, Universitat Autònoma de Barcelona	gregorio.alvaro@uab.cat	Biotechnology	Departament of Chemical, Biological end Environmental Engineering	Greening production processes, Biocatalysis, Multi-enzymatic biotransformations, Biocatalyst engineering and Enzymes production	The proposal will be related to the European project OXIPRO which focuses on the development of novel enzymes – and specifically oxidoreductases – for environment-friendly consumer products for detergent, textile cosmetics and nutraceutics.

Cell Biology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Aurora Ruiz-Herrera Moreno	Associate Profressor	Campus UAB	aurora.ruizherrera@uab.cat	Cell Biology	Institut de Biotecnologia i Biomedicina (IBB)	Exploring the dynamics of genome architecture and gene function in Vertebrates	The central goal of this proposal is to investigate the evolutionary plasticity and function of higher-order vertebrate genome organization, and how this is transmitted to the offspring. We will use these data to provide new interpretive hypotheses on the mechanism(s) responsible for the origin and function of genome architecture. In the present proposal we will focus on the function and the extent of higher-order organization conservation in representative vertebrate genomes. Using cutting-edge computational and experimental methods we will exa whether chromatin interactions are conserved in distantly related vertebrate clades. Our breakthrough research on mammals demonstrates that our goals are feasible, and that analysis of the mechanistic forces responsible for chromatin structure is central to understanding genome organization and evolution in deep evolutionary assemblages.Recent references from the group: Vara et al. (2019a) Cell reports 28 (2): 352-367, e9; Vara et al. (2019b) Mol Biol Evol 36 (8), 1686-1700; Waters and Ruiz-Herrera (2020) TiG 36(10):728-738; Vara et al. (2021) Nature Communications 12 (2981); Waters et al. (2021) PNAS 118(45) e2112494118.
Ignasi Roig Navarro	Associate Professor	office C2/107, Fac. Biociències, Campus UAB, Cerdanyola del Vallès 08193, Spain	ignasi.roig@uab.cat	Cell biology	Genome Integrity and Instability group, Institut de Biotecnologia i Biomedicina (IBB)	To study the function of TRIP13 in meiotic prophase.	TRIP13 is a master regulator of the meiotic cell cycle, controlling DSB repair, chromosome axis formation, desynapsis, MSUC, and the spindle assembly checkpoint. TRIP13s involvement in these events is thought to be done by remodeling HORMA domain proteins. However, in our previous grant, we found evidence that the ATPase function of TRIP13 is dispensable to promote the loading of RAD51 onto resected breaks, implying that TRIP13 may have unexpected scaffolding functions. This proposal will use genetic, proteomic, genomic, and cell biology tools to uncover TRIP13 scaffolding functions in meiosis.

Andreu Blanquer	Postdoctoral Researcher	Vall Moronta St., Sciences Building, Campus UAB	andreu.blanquer@uab.cat	Cell Biology	Dept. Cell Biology, Physiology and Immunology	Magnetoelectric membranes for skin tissue regeneration	The research line will be developed in collaboration with the Instituto de Microelectronica de Barcelona (IMB-CNM, CSIC) and Institut Català de Nanociència i Nanotecnologia (ICN2). The project will explore the new strategies based on energy harvesting and nanodevices to improve skin wound healing. Newly developed magnetoelectric membranes will be tested in terms of biocompatibility, cell differentiation and cell migration in vitro. In addition, the membranes will be optimazed to ensure the enhanced wound healing.
Matilde Esther LLeonart Pajarín and Andreu Blanquer Jerez	Reseacher and teacher of VHIR Master and Postdoctoral Researcher	Passeig Vall d´Hebron 119-129; Collserola Building, 08035 Barcelona (VHIR) & Carrer de la Vall Moronta, Sciences Building, Campus UAB (UAB)	matilde.lleonart@vhir.org and andreu.blanquer@uab.cat	Cell Biology	Dept. Biologia Cel·lular, Fisiologia i Immunologia	The research line is focused in unraveling the resistance mechanisms of cancer stem cells and cancer cells	With around 14 M people worldwide are diagnosed with cancer and over 8 M dying every year, new approaches to therapy are urgently needed. Despite enormous investments, cancer is often incurable and remains the second leading cause of death worldwide. In Europe, head and neck cancer (HNSCC) incidence is increasing. Specifically, the incidence of oral cavity, oropharyngeal and laryngeal cancers continues to rise and is expected to increase by 40%, 30% and 30%, respectively, by 2040. HNSCC patients, unfortunately, do not have many therapeutic options. Accordingly to our previous discoveries, TSPAN1 signaling inhibition by siRNA approach, renders smaller tumors and reduced metastasis. Therefore, we hypothesized that pharmacologycal inhibition of TSPAN1 will be a good strategy against cancer. By in silico studies (artificial inteligence programmes), starting from a library of 200,000 compounds, 20 of them were selected for in vitro testing. Two of them (D13 & D14) were promising by reducing tumor size and metastasis in mice models. The most promising drug (D14) was chemically modified (D14-3) to increase its solubility and to define the Markush formula. Now our aim is to increase the drug potency to reach a terapeutic efficacy of nanomolar (nM) concentrations in vivo. For this purpose additional analogues of D14-3 will be designed and synthesized (up to 200) to test first in vitro (established HNSCC cell lines and HNSCC biopsy-derived cell lines) and further in animal models (mice). Best compound/s (third or fourth round of chemical modifications) in animal models will be combined with CDDP to treat HNSCC tumors. Such combination will be tested in Phase I Clinical trials of HNSCC patients in collaboration with the Clinitians of the Hospital Vall d´Hebron.

Chemistry

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Gregori Ujaque	Associate Professor	Dep. Chemistry, UAB, Cerdanyola del Valles, 08193, Barcelona, Catalonia, Spain	gregori.ujaque@uab.cat	Chemistry	Chemistry	Computational Nanocatalysis	Use of Multiscale Modelling for: (a) Design of nanodevices for catalysis and molecular recognition (Supramolecular catalysis). (b) Developing next generation of catalysts under green chemistry principles
Gonzalo Guirado & Jordi Hernando	Associate Professors	Department of Chemistry, Faculty of Sciences, Campus Bellaterra, UAB	gonzalo.guirado@uab.cat jordi.hernando@uab.cat	Chemistry	Chemistry	Electrochemistry, Photochemistry and Organic Reactivity	The aim of PhD project will be the design, synthesis and characterization of electro- and photoresponsive molecular materials for the fabrication of smart devices (sensors, energy-saving windows, luminescent displays and anti-counterfeiting marks).
Maria Jesús Sánchez Martín	Associate Professor (Tenure Professor)	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	mariajesus.sanchez@uab.cat	Chemistry	Chemistry	Functional Food	According to an estimate, almost 800 million people all over the world are malnourished, around 98% of whom are residing in developing countries. In addition to this, around 2 billion people globally experience another type of hunger, known as hidden hunger, which is caused by poor intake of essential micronutrients in the everyday diet. The aim of this project is to increase this intake through crops biofortification. Different biofortification strategies with essential micronutrients will be developed in different type of crops. NANOTECHNOLOGY and new materials will be used for encapsulating the compounds in order to increase the micronutrients' uptake by foliar application. And different nanomaterials to avoid accumulation in soil or to recover different compounds for their re-use will be developed by means of a circular approach.
Carolina Gimbert Suriñach	Associate Professor	Chemistry Department, Edifici C, Campus UAB 08193 Bellaterra (Cerdanyola)	carolina.gimbert@uab.cat	Chemistry	Chemistry	Functional materials and organic reactivity	Preparation and characterization of organic molecules and materials for light induced chemical reactions including solar fuel production.
Ona Illa i Soler & David Amabilino	Professora Agregada , i Professor CSIC	Departament de Química, Química Orgànica, i ICMAB-CSIC	Ona.Illa@uab.cat i amabilino@icmab.es	Chemistry	Química Orgánica i ICMAB-CSIC	Functional Materials and Organic Reactivity	The project will involve the synthesis of new photoswitchable organic molecules that are capable of performing a number of functions, including acting as molecular motors and as storing thermal energy. The student will learn organic synthesis and phase behaviour of organic materials, matching the complementary experience of the two supervisors.
Xavier Cetó	Associate Professor (Tenure Professor)	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	xavier.ceto@uab.cat	Chemistry	Chemistry	Nanobiosensors design and applications	Design and development of electrochemical sensors employing novel microfabrication techniques and different substrates, as well as their subsequent modification with different nanomaterials and biorecognition elements to improve their response. Developed sensors will be fully characterized, and applied for the qualitative and quantitative analysis of different pharmaceutical and food products.

Manel del Valle	Full Professor	Department of Chemistry, Faculty of Sciences	manel.delvalle@uab.es	Chemistry	Chemistry	Sensors and Biosensors	Application of new technologies for the modification of electrodes, with employement of nanotechnology and late generation nanocomponents (graphene, nanoparticles, MOFs, conducting polymers, molecularly imprinted polymers), with the aim of developing chemical sensors and biosensors for detecting compounds of interest in the environmental, pharmacy or clinical fields. Stages of the research: (1) To prepare and activate electrodes based on carbon platform; (2) Structural, microscopic and electrochemical characterization of electrodes; (3) to Characterize the analytical properties of developed sensors and biosensors; (4) To perform final application of developed devices.
Adelina Vallribera Massó	Full Profesor of Organic Chemistry	Chemistry Department/Organic Section	adelina.vallribera@uab.es	Chemistry	Faculty of Science	Sustainable photoinduced methods for organic synthesis	Photocatalysis and EDA complexes tools will be used for exploration of novel chemical space in organofluorine settings
Ramon Alibés Arqués & Félix Busqué Sánchez	Full Professor/Associate Professor	Edifici CN. Chemistry Department. Faculty of Science	ramon.alibes@uab.cat /felix.busque@uab.cat	Chemistry	Química	Synthesis of Bioactive Organic compouns and Functional Materials (SynOrgFun)	From Small molecules to nanomaterials based on catechol compounds for biomedical applications. The proposal involves oriented research with a high interdisciplinary character focus on the development of new catechol-based bioadhesives and biocompatible magnetic nanoparticles and the development of new transthyretin (TRR) amyloidogenesis inhibitors.
Roger Bofill Arasa & Laia Francàs Forcada	Associate Professor, Investigadora RyC	Office C7/331 (Dr. Roger B.) and Office C7/434 (Dr. Laia F.), Unitat Química Inorgànica, Dept. Química, Facultat de Ciències, Universitat Autònoma de Barcelona, 08193, Bellaterra (Barcelona), Spain	Roger.Bofill@uab.cat; Laia.Francas@uab.cat	Chemistry	Chemistry	Photoelectrodes for the Synthesis of Solar Fuels, High-added-value Organic Molecules and the Degradation of Chemical Pollutants.	Preparation and characterization of modular semiconducting photoanodes and photocathodes for energy and environmental applications: obtention of H2 and reduced carbon products from water and CO2, upgrading of biomass derived molecules (e.g. glycerol and furfural) and degradation of environmetal pollutants. Website: https://seloxcat.com/
Jose Muñoz Martín	Ramón y Cajal Senior Researcher	Office C7/355, Unitat Química Inorgànica, Dept. Química, Facultat de Ciències, Universitat Autònoma de Barcelona, 08193, Bellaterra (Barcelona), Spain	JoseMaria.Munoz@uab.cat	Materials Science	Chemistry	Functionalization of Emerging 2D Materials as Novel Molecular Switches and Sensors.	The chemistry of different emerging inorganic 2D materials (i.e., Monoelemental Materials or Transition Metal Dichalcogenides) will be explored for the custom preparation of stimuli-responsive 2D materials for electrochemically monitoring molecular switches and sensors. This will result in advanced electronic devices. The candidate will join the SelOxCat group that currently integrates two CSC students. See more info: www.seloxcat.com (bio of Jose M.).

Clinical and Health Psychology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Neus Vidal Barrantes	Professor	Office B5-158.12. Department of Clinical and Health Psychology. Faculty of Psychology (Building B). Universitat Autònoma de Barcelona. 08193 Bellaterra (Cerdanyola del Vallès)	neus.barrantes@uab.cat	Clinical and Health Psychology	Department of Clinical and Health Psychology, UAB.	Developmental Psychopathology, Person-Genes-Environment Interaction in the	Emerging research shows that some individual psychological traits render some more susceptible to their surroundings for better and for worse—that is, in a supportive environment, certain genetic, personality, and temperamental traits render an individual more sensitive to all experiences: in a negative, neglectful or abusive one, they will disproportionately suffer, but in a positive, supportive environment, they will also disproportionately benefit from environmental experiences (e.g., Assary et al., 2023; Belsky et al., 2022). This novel thinking based on evolutionary theory is known as the Differential Sensitivity model (Belsky & van Ijzendoorn, 2017; Boyce, 2016), and has been recently encompassed under the umbrella framework of environmental sensitivity (Pluess, 2015; Greven et al., 2019). Following this model, individuals traditionally considered to have greater vulnerability to mental health conditions are considered to have greater susceptibility to environmental influences (i.e., more sensitivity). To date, scant studies have used this model in adult mental health. We recently showed, for the first time, that higher genetic sensitivity, both for childhood environmental experiences and adult daily-life experiences, moderates impact of risk and resilience to express psychotic and depressive symptoms (Barrantes-Vidal et al., in press a, b). This project aims to test the diffential sensitivity theory using nonclinical and clinical samples and also to yield ecological and psychometric measures to capture psychological sensitivity to the environment.

Computer Science

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Carlos Borrego Iglesias	Associate Professor	Building Q, Engineering School, Autonomous University of Barcelona	carlos.borrego@uab.cat	Computer Science	Department of Information and Communications Engineering	Enhancing User Privacy through Deep Learning Analysis of Network Traces	The project aims to enhance user privacy in online communication by employing deep learning techniques on network traces. By analyzing patterns in network traffic, the model will be trained to identify and predict potential privacy vulnerabilities, such as sensitive information leakage. This involves developing a robust deep learning architecture capable of extracting meaningful insights from complex network datasets while respecting privacy constraints.

Eduardo César	Associate Professor	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	eduardo.cesar@uab.cat	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Parallel Agent Based Modeling and Simulation of Social Systems.
Anna Sikora	Associate Professor	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	anna.sikora@uab.cat	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Auto-tuning of HPC applications based on Machine Learning. The goal is to analyze HPC applications and indicate/apply possibilities of their automatic and dynamic tuning using Machine Learning techniques.
Tomàs Margalef	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	tomas.margalef@uab.cat	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Application of High Performance Computing to Environmental Applications: The goal is to design and develop environmental applications related to climate change (forest fire, meteorology, climate modeling) exploiting advanced HPC architectures (Multi/many core processors, accelerators, GPUs, ...).
Miquel Angel Senar	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	miquelangel.senar@uab.cat	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	HPC challenges in genomic applications. This topic relates to the study and design of mechanisms and strategies that can be applied to improve the performance of genomic applications with large demands of data processing. Target computing systems will consist in heterogeneous platforms, combining multicore processors and accelerators (GPUs); and target applications will focus on genome analysis tools that are applied to metagenomics problems.
Joan Serra-Sagristà	Full Professor	Edifici Q, Escola d'Enginyeria, Universitat Autònoma de Barcelona	joan.serra@uab.cat	Computer Science	Dep. of Information and Communications Engineering	Security, coding, and compression	Data compression: deep learning compression, remote sensing data coding, astronomical data coding, high throughput coding, point cloud compression.
Joan Serra-Sagristà	Full Professor	Edifici Q, Escola d'Enginyeria, Universitat Autònoma de Barcelona	joan.serra@uab.cat	Computer Science	Dep. of Information and Communications Engineering	Security, coding, and compression	Data compression: deep learning compression, remote sensing data coding, astronomical data coding, high throughput coding, point cloud compression.
Ivan Erill Sagales	Assistant Professor	Engineering School, Edifici Q, Autonomous University of Barcelona, 08193 Bellaterra, Barcelona, Spain	ivan.erill@uab.cat	Computer Sciences	Department of Information and Communications Engineering	Deep-learning models for structure-based genomic analysis	The gene expression program of a genome is implemented through the binding of different proteins to promoter regions of DNA. This process entails cooperative interactions among proteins as well as the recognition of sequence and structural properties of the DNA molecule that existing models cannot capture. This project seeks to develop a transformed-based deep-learning model incorporating sequence- and structure-based embeddings to predict promoter regions, and to develop the tools to interrogate the system's attention layers to infer contextual protein-DNA interaction rules in promoter models.
Ivan Erill Sagales	Assistant Professor	Engineering School, Edifici Q, Autonomous University of Barcelona, 08193 Bellaterra, Barcelona, Spain	ivan.erill@uab.cat	Computer Sciences	Department of Information and Communications Engineering	Large language model-based (LLM) curation of biomedical literature	Computational reasoning and inference in biomedicine requires that biomedical knowledge be extracted from primary literature sources and stored as ontological statements. Curati biomedical literature is typically performed by trained curators, but this model cannot scale with the rate at which new findings are published. This project seeks to integrate ontological embeddings into an AI LLM framework in order to develop a system capable of automatically generating ontological statements from primary biomedical literature.
Ivan Erill Sagales	Assistant Professor	Engineering School, Edifici Q, Autonomous University of Barcelona, 08193 Bellaterra, Barcelona, Spain	ivan.erill@uab.cat	Computer Sciences	Department of Information and Communications Engineering	Structure-based comparative genomics of regulatory systems	Comparative genomics leverages the availability of large genomics datasets to study the composition and evolution of genetic mechanisms like gene regulatory networks. Our group has developed novel information theory-based models of protein-DNA binding that merge sequence and structure elements of DNA for enhanced prediction of gene regulatory modules. This project seeks to integrate the computational and statistical framework for these new models into a comparative genomics pipeline for the study of the complex gene regulatory networks that orchestrate virulence in bacteria.

Economics, Management and Organizations

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Miguel A García-Cestona	Full Professor (Catedràtic)	Departament d'Empresa, Facultat Economia i Empresa. Av de l'Eix Central. Edifici B. 08193 Bellaterra, Barcelona	Miguel.Garcia.Cestona@uab.cat	Economics, Management and Organizations	Departament d'Empresa	Corporate Governance and Corporate Finance	In recent decades, the topic of corporate governance has received increasing attention from scholars and practitioners alike. Today listed corporations contribute to the major part of economic wealth creation and their governance choices can have significant consequences on global economy. The nature of global ownership it changing. While most of the research treats owners as disengaged and disinterested, most of the corporations around the world are owned by constellations of owners with different interests, priorities and abilities to involve in the governance of the firm they own shares in. Furthermore, in a world that is increasingly more digitalized, relying on electronic communication and transactions as well as on digital databases, cyber risk has become a concern for both companies and consumers. An emerging literature shows that cyberattacks imply a decrease in stock market value. Nevertheless, other stakeholders of the firm such as bondholders and creditors may also suffer from cyberattacks due to their greater risk exposure. Moreover, a firm's cybersecurity risk might lead to changes in corporate governance policy. We hold a large experience in the analysis of different types of ownership and their implications for firm outcomes, as well as in the area of firm credit risk, based on which we propose the following broad topics: 1. Corporate ownership and governance: We will explore how different types of owners jointly influence corporate outcomes. Which constellations of owners are associated with value creation and which may lead to value destruction? In doing so the aim is to shift the focus from the agent to the principal in one of the key debates within the field of corporate governance. 2. Corporate finance: We will investigate the impact of databreaches on firm credit risk. On the one hand, we seek to analyze whether an increased risk of cyberattacks increases firm credit risk and consequently the cost of capital. On the other hand, we will study the role of databreaches in shaping firm corporate governance policies.

Electronic and Telecommunication Engineering

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Gonzalo Seco-Granados	Professor, IEEE Fellow	Engineering School Campus UAB 08193 Bellaterra	gonzalo.seco@uab.cat	Electronic and Telecommunication Engineering	Telecommunications and Systems Engineering	Communications, navigation and networking	Integrated Communications, Localization and Sensing in Distributed Massive MIMO 6G Networks with Intelligent Control of the Propagation Environment The integration of sensing and communications (ISAC) is widely seen as one of the main and disruptive features of the next generation of wireless communication systems. ISAC indeed allows the envisioned 6G network to not only communicate, but also to sense the environment, localise and track users as well as passive devices and objects within the wireless propagation environment, which in turn can be used for mobilising sensing-aided applications and/or improving communication functions. All those functionalities are expected to be offered by the same 6G network infrastructure. Another 6G key enabling technlogy are the reflective intelligent surfaces (RIS). RISs could contribute to improve localization and sensing in many ways and in various operating contexts, especially in challenging environments or limited deployment scenarios. The objective of the research topic is to advance towards a fully integration of ISAC into 6G by addressing the following challenges: - Derivation of bounds and algorithms for multi-static scenarios, overcoming the limitations of the usual monostatic sensing. - Inclusion of large multi-antenna technologies in the ISAC paradigm, such as RIS, extremely large MIMO (XL-MIMO), holographic MIMO. - Waveform optimization for different trade-off between localization and sensing accuray and latency, and communication performance. - Distributed antenna systems calibration for the explotation of phase coherence. - Tracking of dynamic agents with cooperative and perceptual capabilities.
Rosana Rodriguez	Full Professor	Departament d'Enginyeria Electrònica. Escola d'Enginyeria. Campus Universitat Autònoma de Barcelona. 08193. Bellaterra, Barcelona, Spain	Rosana.Rodriguez@uab.cat	Electronic and Telecommunication Engineering	Electronics Enginnering	Emerging Nanoelectronic Devices	Nowadays, the necessity of ultra-scaled electronic devices has produced the appearance of new nanodevices and circuits. In this sense, the devices with resistive switching, as memristors, present extraordinary properties of scaling, operation speed, and lower occupied chip area, which makes them one of most promising candidates for memory, neuromorphic (neural networks) and logic applications. The application of the resistive switching phenomenon has open a new path to the development of a new computer organization, more efficient but completely different to the traditional Von-Neumann computation. Objectives: This proposal is to experimentally investigate the electrical characteristics and reliability of resistive switching nanodevices oriented to the implementation of memory cells, neuromorfic systems and logic applications. Our consolidated research group has an experience of more than 30 years in the field of electrical characterization and reliability. Supervisor: Rosana Rodríguez. Electronic Engineering Department. e-mail: Rosana.Rodriguez@uab.cat
Miquel Vellvehi (CSIC) / José Rebollo (CSIC) / Gabriel Abadal (UAB)	CSIC Tenured Researcher / CSIC Scientific Researcher / Profesor del Dep. Electronica de la Escola de Enginyeria (UAB)	Carrer dels Til.lers s/n Campus UAB. Cerdanyola del Vallpes / ETSE Edifici Q Carrer de les Sitges 08193 Bellaterra	miquel.vellvehi@csic.es jose.rebollo@imb-cnm.csic.es	Electronic and Telecommunication Engineering	Institut de Microelectrònica de Barcelona (IMB-CNM)	Micro & nano- electronic Technology	Development of power device manufacturing on Si and/or UWBG (gallium oxide). Device design and simulation, set up of individual fabrication process steps (deposition, oxidation, etching, ion implantation...), mask design and device fabrication. Extensive electro-thermal characterisation of fabricated devices (die and wafer levels and packaged ones).
Núria Barniol Beumala	Full Professor	Dept. Enginyeria Electrònica, Engineering School (Edific QC) Universitat Autonoma Barcelona E 08913 Bellaterra	nuria.barniol@uab.cat	Electronic and Telecommunication Engineering	Dept. Electronics Engineering	Micro and Nano electromechanical Systems (MEMS/NEMS): CMOS integration and applications	Design of Piezoelectrical Micromachined Ultrasound Transducers (PMUTs) arrays integrated on CMOS for high resolution acoustic imaging towards single cell assessment in serous fluids.
Núria Barniol Beumala	Full Professor	Dept. Enginyeria Electrònica, Engineering School (Edific QC) Universitat Autonoma Barcelona E 08913 Bellaterra	nuria.barniol@uab.cat	Electronic and Telecommunication Engineering	Dept. Electronics Engineering	Micro and Nano electromechanical Systems (MEMS/NEMS): CMOS integration and applications	Development of a multi-frequency PMUTs-on-CMOS platform for controllable 3D arbitrary acoustic field and its application to neuromodulation.
Pedro de Paco Sánchez	Principal Researcher and Engineering School Professor	Escola Enginyeria - Edifici Q - Campus UAB. 08193 Cerdanyola del Vallès. Telf: 0034 93 581 47 35	pedro.depaco@uab.es	Electronic and Telecommunication Engineering	Telecommunications and System Engineering	Microwaves Engineering. Filters and Multiplexers for 5G/6G based on AW piezoresonators.	The Mobile Broadband data service has been under a fast growing cycle during the last years fueled by ubiquity. However, the most important point is that this unsparing traffic growth demonstrates the importance of wireless internet access to individual citizens, societies and economies, while simultaneously presenting a huge challenge to industry. In response to this traffic growth there is ruthless pressure on mobile infrastructure and mobile devices to become more efficient with the spectrum usage and more energy-efficient, evolving into a greener mobile network. The performance limitation of any wireless network will always be at the physical layer, because, the amount of information that can be transferred between two locations is limited by the availability of spectrum, the laws of electromagnetic propagation, and the principles of information theory. Solving a challenge of this magnitude will require not just new resources, but also a radically different approach to acquiring, deploying and managing these resources. To tackle the challenge of increased data rates with lower carbon footprint, all efforts can be summed up into three main groups: 1) small cells everywhere, 2) higher efficiency across the system, 3) more spectrum. Acces point densification will require minimization and greener infrastructures, maximizing spectral efficiency through multiple antenna is the only viable approach for substantial improvement and more available spectrum will require more complex architectures within infraestructure and devices. This general vision justifies the continual pressure to shrink the available area per band for RF Front End Module (RFFEM), while the compliance matrix of the spectrum mask specifications keeps growing. Leaps in technology are necessary to enable these advancements in device performance. From a holistic approach, our research proposal focuses on the exploration and understanding of advanced multifunctional materials and their relation with the development of advanced devices to cope with the huge challenge of RFFEM Evolution. These application-oriented materials are responsible for the characteristic function that the device or the component must undertake with a high demanding performance, requiring new and/or advanced simulation and design methodologies and tools. The target is the development of advanced RF-Filter design methodologies based on mems devices, to cope with new spectrum requirements for 5G/6G through advanced responses and the entanglement with functional materials. Study of the performance of lateral excited and longitudinally coupled resonators (XBAR-CRF) to improve RF and microwave filter performance. Train creative and innovative early-stage researchers through an intersectorial and interdisciplinary excellence and outstanding research programme in collaboration with the most relevant companies.

Xavier Oriols	Full professor	Dept. Enginyeria Electrònica (Edific QC) Universitat Autonma de Barcelona 08913 Bellaterra (SPAIN)	xavier.oriols@uab.es	Electronic and Telecommunication Engineering	Electronics Enginnering	Quantum solid-state devices with strong interaction between light and matter	Using light-matter interaction in the strong regime to develope new quantum electron devices at THz frequencies (https://journals.aps.org/prb/abstract/10.1103/PhysRevB.106.205306)
Gonzalo Murillo Rodriguez (CSIC) / Andreu Blanquer Jerez (UAB)	Researcher at the IMB-CNM (CSIC) / Ramón y Cajal Departament de Biologia Cel·lular, de Fisiologia i d'Immunologia (UAB)	IMB-CNM, Tillers s/n , Bellaterra, Spain Dept. Biologia Cel·lular, Fisiologia i Immunologia Unitat de Biologia Cel·lular Facultat de Biociències Campus de la UAB - 08193	gonzalo.murillo@csic.es	Electronic and Telecommunication Engineering	Dep. Electronica	Self-powered bioelectronic micro devices	Self-powered Micro and Nanodevices for bioelectronic applications in cell biology.
Gonzalo Murillo Rodriguez (CSIC) / Gabriel Abadal Berini (UAB)	Researcher at the IMB-CNM (CSIC) / Profesor del Dep. Electronica de la Escola de Enginyeria (UAB)	IMB-CNM (CSIC) carrer Til·lers s/n, 08193 Bellaterra / ETSE Edifici Q Carrer de les Sitges 08193 Bellaterra	gonzalo.murillo@csic.es	Electronic and Telecommunication Engineering	Dep. Electronica	Sustainable Micro and Nanogenerators	Development of Micro and Nanogenerator based on piezoelectric and triboelectric sustainable nanomaterials
Marc Porti Pujal	Associate Professor	Departament d'Enginyeria Electrònica. Edifici Q, Campus Universitat Autònoma de Barcelona, 08193. Bellaterra, Barcelona, Spain	marc.porti@uab.es	Electronic and Telecommunication Engineering	Electronics Enginnering	Variability and Cryptography with graphene based nanoelectronic devices	The PhD student's work will be focused on the electrical properties, variability and reliability of emergent devices as those based on graphene (and/or other 2D materials or printed technologies), which are of paramount importance for IoT. To do that, standard characterization techniques at wafer level and nanoscale resolution tools as Atomic Force Microscope based techniques will be combined. The goal is to study their variaiblity, reliability and its explotation for security applications. The PhD student will work in one of the hottest topics in nanoelectronics in a group with collaborations with worldwide research institutions and companies in the field of micro/nanoelectronics and will adquire extensive experience in characterization techniques, experimental work and/or simulation tools. The collaborative framework provided by the group will give an international projection to the student activities.

Entrepreneurship and Management

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Joan-Lluís Capelleras	Associate Professor	Department of Business, Faculty of Economics and Business Studies, 08193 Bellaterra (Cerdanyola)	joanlluis.capelleras@uab.cat	Entrepreneurship and Management (IDEM)	Department of Business	Entrepreneurship, Innovation and SME Management	The PhD Program in Entrepreneurship and Management (IDEM) offers students an academic framework for scientific research in the field of entrepreneurship. The proposed doctoral thesis will be on the topic of high growth entrepreneurship. The aim is to investigate how opportunities emerge across countries and the boundaries that the institutional context set on those seeking entrepreneurial efforts. Specifically, the dissertation will examine how both individual mechanisms and national institutions affect entrepreneurial growth. A large dataset that combines individual- and country-level data covering around 50 countries for a ten-year period will be used..

Environmental Science and Technology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Montserrat Sarra	Associate professor	School of Engineering. C/ de les Sitges, s/n. 08193 Bellaterra. Cerdanyola del Vallès (Barcelona)	Montserrat.Sarra@uab.cat	Environmental Science and Technology	Dept Chemical, Biological and Environmental Engineering	Biodegradation of Industrial Contaminants and Waste Valorisation	Halogenated organic compounds in general, and chlorinated compounds in particular, have been widely produced and used for industrial and agricultural purposes. But improper use, storage, and disposal have resulted in global pollution due to its characteristics such as inherent stability, bioaccumulation, low water solubility, volatilization, and long-distance migration. In recent years, one of the emerging sustainable and versatile technologies to improve bioremediation processes is the bio-electrochemical systems. In this project, microbial fuel cells will be used where the use of white rot fungi, producers of extracellular oxidoreductase enzymes, in the cathodic chamber can enhance the reduction of oxygen as a terminal electron acceptor, as well as demonstrating the ability to degrade organo-contaminant xenobiotics. The main objective of this project is the bio-electrochemical degradation of organochlorine pollutants into non-toxic products through fungal microbial fuel cells (F-MFC). Lindane will be used as a model pollutant, but the study will be extended to other organochlorine compounds. Laboratory studies will therefore be carried out to explore the dechlorination potential of white rot fungi growing on the cathode of microbial fuel cells.
Antoni Sánchez	Full Professor	UAB, Escola d'Enginyeria, Edifici Q, Carrer de les Sitges, 08193 Barcelona	antoni.sanchez@uab.cat	Environmental Science and Technology	Department of Chemical, Biological and Environmental Engineering	Composting of organic solid waste	Optimization of the composting process using biochar: iis effect on process parameters, gaseous emissions (ammonia, greenhouse gases, volatile organic compounds and odours) compost quality.
Xavier Font Segura	Full Professor	c/ de les Sitges, s/n, Escola d'Enginyeria, Campus UAB, 08193 Cerdanyola del Vallés, Barcelona	xavier.font@uab.cat	Environmental Science and Technology	Chemical, Biological and Environment Engineering Dpt.	Composting, bioconversion of organic waste and environmental remediation	In the framework of Circular Economy and Climate Change crisis, anaerobic digestion is pointed as a key technology to contribute to our sustainability. Our project is aimed to demonstrate that the anaerobic digestion process can be further improved by using nanomaterials. This improvement can be achieved through two strategies. By one side, nanoparticles can be used to improve the biological process of anaerobic digestion by its addition to the biological process. On the other side, it is possible to obtain valuable products from the CO2 contained in biogas (such as methanol, lactic acid or formaldehyde). The goal of this proposal is to produce and characterize different types of nanoparticles (Fe, Co, Ni, …) test them in batch anaerobic digestion processes and select the best nanoparticles to perform anaerobic digestion in continuous mode at 5L scale and pilot (100 L) scale and to obtain valuable products from the remaining CO2.

Ariane Arias Ortiz	Ramon y Cajal Researcher	Physics Department, Campus UAB, Carrer del Til·lers s/n, 08193 Bellaterra	ariane.arias@uab.cat	Environmental Science and Technology	Institute of Environmental Sciences and Technologies (ICTA)	Greenhouse gas emissions in wetlands	Interactions between microbial community dynamics and ecosystem methane fluxes

Genetics

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Laura Botigué & Antonio Barbadilla	External, Associate Professor	Edifici CRAG, Carrer de la Vall Moronta, Campus UAB, Cerdanyola, 08193	laura.botigue@cragenomica.es	Genetics	Centre for Research in Agricultural Genomics (CRAG)	Comparative genomics and evolution	FREEWHEAT aims to increase our understanding of wheat genome evolution under domestication. This projects uses genomics, molecular biology and population genetics theory and bioinformatics to study one of the most important episodes in the history of wheat, the transition from the first domestic wheat to modern varieties, by characterising the free-threshing phenotype. We are generating high quality genomic data to study the genetic variability within and around QTL that have been previously associated with the trait, and will generate transcriptomic data to investigate its genetic basis. As a novelty, I will investigate differences in structural variation between the hulled and the free-threshing forms, a source of variability that accounts for more than 80% of the wheat genome and is yet usually ignored, even if it can be directly involved in the phenotype. The data generated in FREEWHEAT will also be used to test to what extent the highly repetitive content of the wheat genome affects the performance of selection statistics, setting the foundations to build in the long term selection statistics that are able to account for this source of variability. The scope of this project is deeply rooted in the discipline of evolutionary biology, even if it also addresses historical questions such as when and where did free-threshing wheats started to be selected for, and technical questions like how genome architecture disrupts the classical genomic signal for positive selection. Results from this proposal will provide fundamental knowledge on i) wheat genome evolution, ii) a largely unexplored topic such as the patterns of positive selection in highly repetitive genomes, and iii) the historical origins of modern wheat varieties. This knowledge has important implications across different disciplines. In agronomy, understanding the evolution of the wheat genome and the ability to identify the regions of the genome that are under positive selection provide valuable information for future breeding programmes, and in social sciences understanding the origins of wheat improve our understanding of human history and the development of agricultural societies.
Marta Puig Font	Serra Húnter Lecturer	Institut de Biotecnologia i Biomedicina (IBB), Parc de Recerca Modul B, 08193 Bellaterra (Barcelona)	marta.puig@uab.cat	Genetics	Institut de Biotecnologia i Biomedicina (IBB) / Department of Genetics and Microbiology	Structural and functional characterization of complex regions in the human genome	Structural variants (SVs) of different types (deletions, duplications, inversions) accumulate in repeat-rich regions of the genome forming complex structural haplotypes (combinations of different SVs in a chromosome) that are polymorphic in human populations. Due to their size and complexity, these regions are excluded from most sequencing projects, and their exact nature, effects on gene expression, and contribution to human phenotype and disease remain unexplored. I propose to characterize these complex structural haplotypes in detail integrating all available information, and to develop a method to genotype the different structural haplotypes in each region using Oxford Nanopore Technologies (ONT) long reads, which can be up to hundreds of kb long. This method would use a combination of bioinformatic analysis and experimental data. The characterization and genotyping of these complex regions will allow us to analyze their effects on the expression of genes contained within or close to them.

Materials Science

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Anna Laromaine (ICMAB-CSIC) & Alex Peralvarez (Tutor UAB)	Cientifica Titular ICMAB / Associate Professor in Biophysics UAB	Institut Ciencia de Materials de Barcelona- Campus UAB	alaromaine@icmab.es	Materials Science	Institut Ciencia de Materials de Barcelona-Campus UAB	Biomaterials and nanocomposites	Project title: Natural polymers nanocomposites for biological applications Implantation of engineered smart biomaterials are at the forefront of healthcare research, and those structures are gradually transitioning to biomimetic and bioactive platforms. Multidisciplinary efforts from materials science, biomedicine, cell therapies, and clinical methodologies are requested to improve current biomaterials. Soft nanocomposites using natural polymers with fine-tuned mechanical and functional properties are propitious alternatives to allografts, autografts, and synthetic polymers in the development of biomedical implants. In this context, the main objective of this thesis is to enlarge the natural polymers landscape of soft nanocomposite implants by combining natural polymers and nanoparticles toward functional platforms for medical applications beyond the current state-of-the-art. We want to design sophisticated natural hydrogels and nanoparticles systems displaying a variety of shapes, topographies and porosities while also encompassing features such as biocompatibility, biointegrability, mechanical compliance, stimuli responsiveness or programmed biodegradation profiles. We suggest evaluating the performance of soft materials made of natural polymers, such as silk, collagen and polysaccharides such as cellulose, hyaluronic acid and chitosan and combine them with selected inorganic functional nanoparticles (NPs). We are looking for a highly motivated student with background in biotechnology/ biomedicine/ biochemistry/ nanoscience/ polymer science or chemistry that would like to work in an international and interdisciplinary group within an innovative project with interesting prospective applications. The student will have to speak perfect English with good teamwork skills. We encourage the application of student of the described backgrounds; acceptance will be based on an interview and reference letters. We are looking for a highly motivated student with background in biotechnology/ biomedicine/ biochemistry/ nanoscience/ polymer science or chemistry that would like to work in an international and interdisciplinary group within an innovative project with interesting prospective applications. The student will have to speak perfect English with good teamwork skills. We encourage the application of student of the described backgrounds; acceptance will be based on an interview and reference letters.

Alberto Pomar & Ramón Yañez	Investigador Científico ICMAB-CSIC/ Profesor Titular	Instituto de Ciencia de Materiales de Barcelona. Campus UAB	apomar@icmab.es, ramon.yanez@uab.cat	Materials Science	Instituto de Ciencia de Materiales de Barcelona. ICMAB, Departament de Química	Complex oxides for spintronic applications	Spintronics is a rapidly growing field of research that involves the generation, manipulation and control of the spin of electrons in materials. These have the potential to revolutionize information technology by providing faster, more efficient, and more versatile ways of processing and storing information. In this context, complex oxides have gained significant attention in recent years since they can combine a relatively low damping with a wide range of magnetic and electronic properties that can be tuned by controlling the crystal structure or composition of the material. In this project of thesis the student will work on the preparation and characterization of complex oxide thin film and heterostructures aimed to the development of spintronic devices.
Jordi García-Antón Aviñó	Associate Professor	Office C7/325,1 (Dr. Jordi G.-A.), Unitat Química Inorgànica, Dept. Química, Facultat de Ciències, Universitat Autònoma de Barcelona, 08193, Bellaterra (Barcelona), Spain	Jordi.GarciaAnton@uab.es	Materials Science	Chemistry	Design of nanocatalysts for boosting energy conversion reactions	Integration of inorganic nanoparticles (transition metals and metallic oxydes) onto semiconductor materials' surfaces for improving energy conversion reactions as renewable fuels sources, including hydrogen production from water splitting and reduced carbon products from carbon dioxide. See more info: www.seloxcat.com (bio of Jordi G.-A).
Martí Gich García & Pedro Antonio de Paco Sánchez	Lecturer at the Advanced Nanoscience and Nanotechnology master's degree and CSIC researcher (M. Gich) ; Principal Researcher and Engineering School Professor (P. de Paco)	ICMAB-CSIC c/Til·lers s/n Campus UAB 08193 Cerdanyola del Vallès ; Escola d'Enginyeria - Edifici Q - Campus UAB. 08193 Cerdanyola del Vallès.	mgich@icmab.es ; pedro.depaco@uab.es	Materials Science	Institut de ciència de Materials de ICMAB-CSIC (M. Gich); Telecommunications and System Engineering (P. de Paco)	Development of functional materials (M. Gich) and Microwaves Engineering. Filters and Multiplexers for 5G/6G based on AW piezoresonators (P. de Paco)	The relentless demand to increase data rates, data traffic, and connected devices in our mobile communications has prompted a paradigm shift in wireless technology. 5G and the forthcoming 6G will use mm-waves and miniaturized antenna systems that will need to be low-cost and energetically efficient. An unresolved challenge of this transition is the miniaturization of passive ferrite-based non-reciprocal devices above 100 GHz, for which bulky external magnets are required.The PhD objective is to contribute to the development of miniaturized self-biased non-reciprocal magnetic components for the forecasted 6G evolution. New ferrites with mm-wave resonances will be the key functional materials underpinning the operation of the targeted devices.
César Fernández Sánchez (CSIC), Maria del Mar Puyol Bosch (UAB), Martí Gich (CSIC)	CSIC Scientific Researcher (CFS); Profesor Titular UAB (MPB); Científico Titular (MG)	Instituto de Microelectrónica de Barcelona, IMB-CNM (CSIC) Universidad Autónoma de Barcelona (UAB) ICMAB (CSIC)	cesar.fernandez@csic.es	Materials Science	IMB-CNM	Micro- and Nanoelectronics and Micro- and Nanosystems	Development of functional materials based on carbon matrices and funcional nanomaterials to be applied in the production of electrochemical sensors for the sensitive detection of emerging pollutants in surface waters
Javier Rodriguez Viejo	Full Professor UAB/Group Leader ICN2	ICN2, campus UAB	javier.rodriguez@icn2.cat	Materials Science	Grup de Propietats Tèrmiques de Materials en la Nanoescala/ICN2	Micro i nanoelectrònica. Micro i nanosistemes.	Oxide ferroelectrics haves multiple functionalities suitable for energy conversion and storage. Our motivation is to use oxide ferroelectric membranes for pyroelectric energy conversion to convert low-graded heat into energy. The pyroelectric coefficient and energy scavenging will be investigated near the critical-like transformation by using membrane-based resisitive devices with tuned thermal link with the surroundings that allow for fast heating and cooling and therefore large pyroelectric effects.
Javier Rodriguez Viejo	Full professor UAB/GRoup Leader ICN2	Physcs department	javier.rodriguez@uab.cat	Materials Science	Grup de Propietats Tèrmiques de Materials en la Nanoescala/Physics/UAB	Micro i nanoelectrònica. Micro i nanosistemes.	We aim to develop energy-efficient, organic and flexible multibit memories using local poling of nm-size regions of an ultrastable dipolar glass. The project is expected to exploit to an unprecedented extent a temperature-voltage-driven actuation in dipolar glasses to forge a new paradigm in flexible memories.
Borja Sepúlveda Martínez (CSIC) / Mar Álvarez Sánchez (CSIC)/ Andreu Blanquer Jerez (UAB)	CSIC Scientific Researcher / CSIC Tenured Researcher / Ramón y Cajal researcher Dept. Biologia Cel·lular, Fisiologia i Immunologia(UAB)	Instituto de Microelectrónica de Barcelona IMB-CNM (CSIC), Campus UAB 08193 Cerdanyola del Vallès (Barcelona) Spain Dept. Biologia Cel·lular, Fisiologia i Immunologia Unitat de Biologia Cel·lular Facultat de Biociències Campus de la UAB · 08193 Bellaterra (Cerdanyola del Vallès) · Barcelona · Spain	borja.sepulveda@imb-cnm.csic.es / mar.alvarez@imb-cnm.csic.es	Materials Science	Instituto de Microelectrónica de Barcelona IMB-CNM (CSIC)	Opto-mechanical nanosystems for therapeutic actuation and detection	The main objective of the PhD tesis is to develop novel opto-electric and magneto/opto-mechanical nano-structures for minimally invasive wireless electrical and mechanical stimulation of superficial (e.g. retina) and deep neural tissues, and non-invasive detection.

Mathematics

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Roberto Rubio	Ramón y Cajal fellow	Faculty of Sciences, Campus UAB, 08193 Barcelona	roberto.rubio@uab.cat	Mathematics	Department of Mathematics	Differential Geometry	Generalized geometry: naturality, connections and low dimensions (GENTLE). Generalized geometry is a revolutionary approach to geometric structures; generalized complex structures encompass symplectic and complex geometry while also reaching the very narrow area between complex and almost complex structures; generalized Kähler geometry and certain Courant algebroids provide a more natural language to several physical theories; and the theory has showed its potential to provide insights or make advances into purely differential-geometric questions. The PhD candidate will join the project GENTLE, from the Spanish State Research Agency, and will work in the aspect (naturality, connections or low dimensions) more suitable to his/her expertise.

Medicine

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line

Jaume Alijotas Reig	Full Professor	Vall Hebron Universtity Hospital. Passeig Vall d'Hebron 119-129, 08035-Barcelona, Catalonia, Spain	jaume.alijotas@vallhebron.cat	Medicine	Medicine HVH VHIR. Department of Medicine. Faculty of Medicine, UAB	Animal and human pathology related to antiphospholipid antibodies	Immunology, cellular immune activation of circulating lymphocytes in APS patients.

Microbiology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Esther Julián Gómez	Professor	Mycobacteria Research laboratory. Department of Genetics and Microbiology. C Building. Biosciences Faculty.	esther.julian@uab.cat	Microbiology	Genetics and Microbiology	Study of non-tuberculous mycobacteria as therapeutic tools and models of pathogenicity	The use of bacteria to treat cancer is one of the open forefronts, being a raising issue. There is a successful cancer therapy using bacteria: the case of M. bovis BCG, that is the first treatment option for non-muscle-invasive bladder cancer. Although efficacious, BCG is not a perfect therapy. Nontuberculous mycobacteria have arisen as a strong alternative to BCG treatment. We aim to understand the immunomodulatory and antitumor capacity of different species of non-pathogenic mycobacteria and BCG, both in the treatment and prevention of cancer progression and in other immune dysregulated diseases. For latest publications see: https://sites.google.com/view/mycobacteriaresearchlabuab/publications

Neurosciences

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Carlos A. Saura	Associate Professor	Unitat de Bioquímica i Biologia Molecular, Facultat de Medicina, UAB	carlos.saura@uab.cat	Neurosciences	Biochemistry and Molecular Biology/Institut de Neurociències	Biological basis of aging and dementia	Transcriptional +I114:I121mechanisms of synaptic plasticity and memory in Alzheimer´s disease. Alzheimer's disease (AD) is the most common dementia disorder but the cellular pathways causing neuronal dysfunction, memory loss and neurodegeneration are unclear. Our lab combines molecular and behavioral approaches, and cutting-edge genomic and cell-specific transcriptomic and proteomic methodologies in novel AD transgenic and knockout mouse models to better understand the molecular mechanisms mediating gene expression changes causing synaptic dysfunction and memory loss in AD. These studies provide knowledge of novel molecular targets and therapeutic strategies for early treatment of AD and related neurological disorders. More information: https://www.sauralab.com/
ALEX PERALVAREZ-MARIN	Associate Professor	Biophysics Unit / Department of Biochemistry and Molecular Biology / Institute of Neurosciences Schol of Medicine	alex.peralvarez@uab.cat	Neurosciences	Biochemistry and Molecular Biology / Institute if Neurosciences	Cannabidiol as a wide spectrum multitarget drug	Cannabidiol is a multitarget drug. Using Biophysics, Cell biology, and Molecular Biologywe will assess the role of Cannabidiol in several integral membrane targets relevant for human pathophysiology, such as TRP channels and GPCR receptors.
Clara Penas	Intern Titular Professor	Physiology Unit. Medicine Faculty. Universitat Autònoma de Barcelona. 08193 Bellaterra, Spain	clara.penas@uab.cat	Neurosciences	Cell Biology, Physiology and Immunology Deparmtent/ Neurosciences Institute	Epigenetic therapy to enhance functional outcome after traumatic injuries of the nervous system	The main goal of the PhD Tesis is to examine the potential of specific epigenetic compounds to enhance neuroprotection, neuroplasticity and functional outcome after brain stroke. For this purpose, primary cultures of neurons, astrocytes and microglial cells will be used, as well as an in vivo model of brain stroke in mice. The experimental settings encompass from molecular biology, cell biology, to behavioral and histologic assessment in mice.
Jose Rodriguez Alvarez	Professor of Biochemistry & Molecular Biology	Laboratory M2-115, Edifici M, School of Medicine, Campus de Bellaterra, Barcelona, Spain.	jose.rodriguez@uab.cat	Neurosciences	Institute od Neurosciences / Dpt Biochemistry & Molecular Biology	Mechanisms associated to early cognitive deficits in Alzheimer's disease. Biomarkers and new therapeutic strategies / Mecanismes associats als déficits cognitius primerencs a la malaltia d'Alzheimer. Biomarcadors i noves estratègies terapèutiques en la malaltia d'Alzheimer.	Molecular mechanism involved in synaptic deficits
Natalia Lago Pérez	Tenure Lecture position	Medical Physiology Unit, Faculty of Medicine, Universitat Autònoma de Barcelona (UAB)	natalia.lago@uab.cat	Neurosciences	Cell Biology, Physiology and Immunology/Institute of Neuroscience (Inc)	Modulation of Immune receptors to target neuroinflammation in spinal cord injury	Some of the pathologies affecting the Central Nervous System (CNS) such as traumatic spinal cord injury share active inflammatory processes that ultimately fail to resolve. These pathologies share the overactivation of microglia and resident astrocytes, as well as a high blood cell recruitment. The high demyelination that occurs in the axonal tracts of the spinal cord generates a large amount of myelin debris, composed of lipids and specific proteins, which must be phagocytosed, metabolized and eliminated. Inflammation resolves only when this cleaning process is completed, allowing the generation of a regenerative environment in which remyelination and compensatory synaptic plasticity can occur. The immunoreceptor CD300f modulates systemic inflammatory processes and participates in the phagocytosis of apoptotic cells; it is expressed by cells of the myeloid lineage including microglia. Its ligs are lipidic in nature, so it has been postulated that it could act as a sensor of damage-associated molecular patterns (DAMPs). Thus, it would play an important role in demyelination processes where an overload of lipid debris is generated. The main objective of the present proposal is to understand the mechanisms by which the CD300f immunoreceptor contributes to functional recovery after traumatic spinal cord injury and whether it may constitute a potential therapeutic tool. From this main objective, we ask several questions: a) what is the role of CD300f in the regulation of microglial and peripheral myeloid cell phenotype after spinal cord injury? b) what is the role of CD300f in phagocytosis and clearance of myelin and toxic lipids in demyelinating lesions? c) can we improve functional recovery after spinal cord injury by activating the CD300f immunoreceptor?

Arnaldo J. Parra Damas	Investigador Ramón y Cajal (2022) Investigador Juan de la Cierva-Incorporación (2019)	Unitat de Bioquímica i Biologia Molecular, Facultat de Medicina, UAB	arnaldo.parra@uab.cat	Neurosciences	Institut de Neurociències. Dt Biochemistry and Molecular Biology	Molecular basis of synaptic dysfunction in dementia	Molecular mechanisms underlying synaptic dysfunction in Alzheimer´s disease. Our lab combines molecular and behavioral approaches, including cell type-specific omics approaches and epigenetic editing tools to characterize and modulate specific neuronal populations vulnerable to synaptic dysfunction in AD. We aim to reveal novel therapeutic strategies and biomarkers for early diagnosis and treatment of AD and related neurolodegenerative disorders.
Santiago Rojas Codina & Gemma Manich Raventós	Associate Professor/ Lecturer	Faculty of Medicine, Tower M6, Av Can Domènech s/n	Santiago.Rojas@uab.cat Gemma.Manich@uab.cat	Neurosciences	Department of Morphological Sciences (Unit of Human Anatomy and Embriology) / Institute of Neurosciences	Neuronal acute damage	Characterizatin of histological and MRI alterations in a rat model of intracerebral hemorrhage. Intracerebral hemorrhage (ICH) is a fatal condition with a high rate of disability, poor diagnostic tools and no available drug treatment. The histopathological basis of alterations observed by MRI in patients suffering ICH are not precisely known, and this impairs a proper diagnosis, prognosis and treatment of affected patients. The aim of this work is to use a a rat model of ICH produced to study the histological and blood peripheral alterations and its correlation with MRI imaging. We will characterize the main neuroinflammatory and neurodegenerative tissue alterations, we will determine peripheral inflammatory blood markers, and we will study MRI tissue alterations using histological, imaging and molecular techniques.
Emma Puighermanal	Ramon y Cajal Investigator	Autonomous University of Barcelona - Plaça Cívica, 08193 Bellaterra, Barcelona, Spain	emma.puighermanal@uab.cat	Neurosciences	Institute of Neuroscience - School of Medicine -	Study of the molecular mechanisms triggered by cannabinoids in the brain	By using state-of-the-art tools, the project aims to uncover the mechanisms by which cannabinoids exert some of their pharmacological effects in the mouse brain
Montse Solé Piñol	Ramon y Cajal researcher	Dpt. Bioquímica i Biologia Molecular, M2-115/M2-003. Facultat de Medicina. Campus UAB	montserrat.sole@uab.cat	Neurosciences	Dpt. Biochemistry and Molecular Biology. Neurosciences Institute	Mechanisms of Neurodegeneration and new therapeutic targets in tauopathies	To elucidate the role of the endogenous anti-apoptotic neuronal protein FAIM-L in Tau-related neurodegeneration using in vitro and in vivo models.

Pharmacology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Francesc Jiménez-Altayó	Associate Professor	Edifici M, Av. de Can Domènech, 08193 Bellaterra, Barcelona	francesc.jimenez@uab.cat	Pharmacology	Department of Pharmacology, Therapeutics, and Toxicology / Neuroscience Institute	Ischemic stroke	Identification of plasma markers predicting carotid atherosclerotic plaque progression and risk of ischemic stroke in asymptomatic patients

Physics

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line
Verònica Ahufinger Breto	Catedràtica d'Universitat (Full Professor)	Science Faculty. Physics Dept. Campus UAB, E-08193, Cerdanyola del Vallès, Spain	veronica.ahufinger@uab.cat	Physics	Physics Department	Quantum simulation	Theoretical (analytical and numerical) study of the implementation of non-trivial topological models in photonic systems. Use of Supersymmetry transformations and adiabatic techniques to engineer topology in discrete photonic systems and explore the use of orbital angular momentum modes and nonlinear materials.
Riccardo Rurali Xavier Cartoixà	Investigador Científic del CSIC /professor asociat UAB	ICMAB-CSIC, Campus de Bellaterra, Escola d'enginyeria UAB	rrurali@icmab.es, xavier.cartoixa@uab.es	Physics	Theory and Simulation of Materials, ICMAB-CSIC / Enginyeria Electrònica	Theory and simulation of the behaviour of materials / Materials physics	PHONON TRANSPORT IN NANOSTRUCTURED MATERIALS - The goal of this project is providing a theoretical framework aimed at understanding and controlling the manipulation of heat flux within nanostructured materials, for application in phonon logic and for novel materials for clean and sustainable energy. The student will perform quantum numerical simulations in order to devise realistic approaches for the engineering of thermal diodes and thermal transistors, the fundamental building blocks of phononics. In electronics information is transferred with charge carriers, whose motion can be easily controlled with external fields. This is not the case of phononics, where phonons —the basic particles that carry heat— have no mass or charge: this is why we live in a world of electronic devices and heat is normally regarded as a source of loss. The goal of this project is reversing this viewpoint and move to a new paradigm where heat can be actively used to transfer energy, thus information, in a controllable way. This approach allows envisaging a truly zero-power analog of electronics, as in our world heat is indeed ubiquitous and phononics circuits will effectively need no power supply. Additionally, learning how to modulate the heat flow will have also important consequences in conventional electronics —where heat dissipation at the nanoscale is a major issue— or in devising efficient thermoelectric materials —where materials with low thermal conductivities must be engineered. The student will interact closely with experimental groups of the Institute that work on thermal transport in 2D materials and nanostructured semiconductors.

Plant Biology and Biotechnology

Name	UAB Academic Position	Address	e-mail	Doctoral Programme	Department/Institute	Research line of the Doctoral Pr.	Topic Description Proposal related to the Research Line

Julia Qüesta & Jordi Moreno-Romero (UAB professor, co-director)	Researcher at CRAG	Edifici CRAG - Campus UAB	julia.questa@cragenomica.es	Plant Biology and Biotechnology	Plant Development and Signal Transduction Program/CRAG	Edifici CRAG - Campus UAB	Following germination, successful seedling establishment marks the start of the plant life. This PhD project will investigate the molecular processes responsible for post-germinative growth in plants. The transition from a dry seed (embryo) to a developing seedling requires several rounds of cellular differentiation. These differentiation programmes rely on stable epigenetic silencing of key developmental genes, mostly achieved by Polycomb Repressive Complexes (PRC1 and PRC2). In the model *Arabidopsis thaliana*, long non-coding RNAs (lncRNAs) have been linked to PRC silencing. However, the precise mechanisms whereby lncRNAs time the initiation of vegetative growth remain largely unknown. Combining cutting edge transcriptomics, epigenomics and bioimaging, this project aims at revealing previously unpredicted functions of lncRNAs in facilitating early seedling development.
David Caparrós-Ruiz	Permanent Researcher at CRAG	CRAG Buidling, Autonomous University of Barcelona (Spain)	david.caparros@cragenomica.es	Plant Biology and Biotechnology	Plant Synthetic and Metabolic Engineering	Plant Molecular Genetics	Lignin biosynthesis and regulation in maize. Maize represents one of the most important C4 cereal worldwide. Following cellulose, lignin is the second most abundant component of secondary cell walls. It has a crucial role in providing the necessary stiffness to maize stalks. However, the presence of lignin negatively affects the nutritional value of the forage and the energetic value of the maize biomass. Thus, understanding the biosynthesis and regulation of the lignin polymer is a crucial knowledge to obtain new biotechnological tools aimed to generate new maize varieties with increased nutritional and energetic values.
José Luis Riechmann & Jordi Moreno Romero	ICREA Research Professor - CRAG & Ramon y Cajal Fellow	CRAG Building - Campus UAB & Faculty of Biosciences, Building C	joseluis.riechmann@cragenomica.es; jordi.moreno.romero@uab.cat	Plant Biology and Biotechnology	Center for Research in Agricultural Genomics (CRAG) CSIC-IRTA-UAB-UB & Department of Biochemistry an Molecular Biology	Plant Molecular Genetics	Charting the plant peptidome in Arabidopsis and pea: a new layer on plant regulatory mechanisms. The research project aims to address a fundamental question in plant biology: the nature and characteristics of the plant peptidome and the functions that its components perform. Non-conventional peptides, or NCPs, are an important but largely uncharacterized component of the eukaryotic proteome. NCPs have already been shown to play critical roles in human biology. The plant peptidome is largely unknown, and so far, only initial experiments in Arabidopsis, maize and moss have attempted its characterization at a genome-wide scale. The project includes two different but interconnected aims: (i) functional characterization of novel peptides potentially involved in Arabidopsis developmental processes (such as flower/inflorescence development), and (ii) use of a peptidogenomics approach in pea (a model legume and protein crop of relevance for sustainable agriculture) to conduct an initial characterization of its peptidome.