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
Animal Health and Medicine							
Laia Maria Solano Gallego	Catedràtica Laboral d'universitat	Facultat de Veterinaria. Av dels turons sense numero, Bellaterra 08193, Barcelona, Spain	laia.solano@uab.cat	Animal Medicine and health	Animal medicine and surgery	Immunotherapy in canine leishmaniosis	Advancing vaccine development and immunotherapy in canine *L. infantum* infection
Enric Mateu	Professor	Fac. Veterinària, Travessera dels Turons s/n, UAB, 08193 Cerdanyola del Vallès	enric.mateu@uab.cat	Animal Health and Medicine	Dept. of Animal Health	Swine Health - Zoonoses	The project is aimed at understanding the different drivers of the evolution of influenza A viruses in pigs with emphasis on the immunological and epidemiological aspects.
Francesc Accensi i Alemany	Professor agregat	Centre de Recerca en Sanitat Animal (CReSA-IRTA) CReSA Building Campus de la UAB 08193 Bellaterra (Cerdanyola del Vallès) Barcelona Spain	Francesc.Accensi@uab.cat / Francesc.Accensi@irta.cat	Medicine and Animal Health (Programa de Doctorat de Medicina i Sanitat Animals)	Animal Health and Anatomy Dept / Research Center in Animal Health (IRTA-CReSA)	African Swine Fever	African Swine Fever (ASF) is the disease that currently geopardizes global swine industry. Having its origin in Africa, from 2007 on it has been reported, become endemic (and in expansion) in Europe (many countries, including EU) and Asia (including China, Vietnam and many others) -ASF has also appeared in some spots in America (Dominican Republic) and Oceania (Papua New Guinea). There is no treatment, neither a vaccine against its causal agent, ASF virus (ASFV). Unfortunately there is a limited knowledge on ASFV and the mechanims of immune response involved in the protection against ASF. The desperate situation of the worldwide swine industry makes it urgent to get a vaccine to control ASF, and in our laboratory we are nowadays working in the development of a vaccine by means of several approaches: We are refining a promising GMO-based LAV in terms of biosafety but as well we are working to unravel the mechanisms involved in ASF-protection in order to develop subunit vaccins.
Júlia Vergara-Alert	Full professor UAB/Researcher IRTA	Edifici CReSA, IRTA-CReSA	joaquim.segales@uab.cat / julia.vergara@irta.cat	Medicina i Sanitat Animal	IRTA-CReSA	Zoonotic coronaviruses, SARS-CoV-2	Pathogenesis and prevention/control of SARS-CoV-2 infection in animal models
Joaquim Segalés	Full professor UAB/Researcher IRTA	Edifici CReSA, IRTA-CReSA	joaquim.segales@uab.cat / julia.vergara@irta.cat	Medicina i Sanitat Animal	IRTA-CReSA	Porcine enteric coronaviruses	Dissection of the innate immune response against porcine enteric coronaviruses: modulation of interferon type III cytokine production to improve protection at mucosal level
Dr. Natàlia Majó/ Dr. Núria Busquets	Full professor UAB/Collaborator researcher at the master's program in Zoonoses and One Health	Edifici CReSA, Campus UAB	natalia.majo@uab.cat / nuria.busquets@irta.cat	Animal health and medicine (Veterinary faculty UAB)	Dp. Animal Health and Anatomy (Veterinay faculty UAB) /IRTA-CReSA	Arboviruses and arthropod vectors	West Nile virus (WNV) is the most widespread arbovirus in the world. Since the first outbreaks of WNV in horses and humans in Spain in 2010, the disease has reappeared in that region every year. The human cases of WNV in Spain have been sporadic before 2020. The epidemiological situation changed drastically in 2020, as human 77 cases (and 7 deaths) were reported. The scenario in Europe is further complicated by the simultaneous circulation of two distinct lineages, lineage 1 and 2. WNV transmission cycle is complex as it is driven by numerous factors related to the virus, the vectors, the hosts and the environment. Despite extensive research, knowledge gaps around these factors remain and need more research to be elucidated. IRTA-CReSA team incorporates specialists in arbovirology, entomology, and epidemiology, providing the multidisciplinary approach needed to fill those gaps. The objectives of the project "Determination of the role of mosquito vectors and other factors on WNV transmission" include: i) determine the ability of two Culex mosquito species present in Spain to transmit WNV (lineage 1 and 2), which is essential to evaluate the risk. ii) To assess the capacity of WNV lineage 2 to overwinter in Cx. pipiens mosquitoes by vertical transmission and horizontal transmission. iii) Evaluate the ability of a mosquito-specific virus (Culex Flavivirus) to alter the vector competence of Cx. pipiens for WNV, which it may be used as potential WNV control tool. Overall, the results of the project will help to improve the programs for the surveillance and control of WNV. Vector competence studies will be carried out at IRTA-CReSA where Biosafety level 3 (BSL3) laboratories and insectary facilities are available. So that, this project will provide a PhD student with the opportunity to learn more about mosquito-virus interactions and work in BSL3 facilities.
Animal Production							
Josep M Folch	UAB Associate professor at CRAG (Centre de Recerca en Agrigenòmica)	Edifici CRAG. Campus de la UAB. 08193 Bellaterra (Cerdanyola del Vallès) – Barcelona	josepmaria.folch@uab.cat	PhD in Animal Production	Department of Animal and Food Science, University Autonomous of Barcelona	Functional genomics and system genetics approaches applied to improve pig health, production, and meat quality	The research group of CRAG - Autonomous University of Barcelona, generated since 1996 a unique animal material by crossing Iberian pigs with different commercial breeds. Iberian is a native pig breed in Spain characterized by its excellent meat quality. Currently, productive records and genotypes are available for more than 1,500 animals with different genetic backgrounds, including Landrace, Duroc and Pietrain. Many QTLs have been identified for growth, carcass and fatty acid composition and candidate genes studied. New genomic methodologies were applied, genotyping animals with the 60 k porcine chip SNPs (Illumina), analysing the expression of 20,201 genes in muscle with microarrays (Affymetrix), studying the liver, adipose tissue and muscle transcriptomes by RNA-Seq, and sequencing the whole-genome of founder animals. In addition, the pig gut microbiome composition and its effect on growth and lipid metabolism has been studied. In the present project, we are interested in a holistic approach combining immunity, production and meat quality traits to increase pigs' efficiency, health and welfare, while maintaining economic profitability for producers and social acceptance.The research proposal will include the following work packages: 1. Analysis of the pig liver transcriptome by RNA-Seq in 250 pigs with phenotypic records for growth, immunity and meat quality. Study of differentially expressed genes, new genetic variants, genomic regions regulating liver gene expression, and gene expression networks. 2. Analysis of the transcriptome data and productive records using system biology approaches to identify metabolic pathways, regulators, biomarkers, genes and polymorphisms involved in energy homeostasis and affecting both health and productive traits. 3. Functional validation of relevant genetic variants in candidate genes by cell transfection luciferase reported assays, ELISA assays of protein activity, chromatin immunoprecipitation assays, and epitranscriptome modification analysis.
Alex Clop	CSIC Researcher at CRAG (Centre de Recerca en Agrigenòmica)	Edifici CRAG. Campus de la UAB. 08193 Bellaterra (Cerdanyola del Vallès) – Barcelona	alex.clop@cragenomica.es	PhD in Animal Production	Plant and Animal Genomics/ CRAG	Cell level -omics to understand spermatogenesis and boar reproduction in swine	We are currently carrying single cell MultiOME experiments to generate RNA-Seq and ATAC-Seq data at the cell level in the testicles from boars from artificial insemination studs with high genetic merit for production traits. This data will inform on the gene expression and its regulatory complexity for each cell types involved in spermatogenesis. This data will be coupled with whole genome sequencing of several animals with semen quality records and genotypes will be annotated. Variants co-segregating with the phenotype and also mapping within genes expressed ore differentially active regulatory elements will be considered candidates to cause alteration on the semen traits.Different experimental designs will be performed to increase the likelihood to find such variants. A selection of the most promising variants will then be genotyped in other animals for a genetic association study.
Biochemistry, Molecular Biology and Biomedicine							
Ana Paula Candiota	CIBER senior Researcher Ascribed to UAB	Edifici Cs Campus UAB, Department of Biochemistry and Molecular Biology (Lab C/225)	AnaPaula.Candiota@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Molecular biophysics and application to medicine	Noninvasive biomarkers of therapy response in preclinical brain tumours through MRSI-based molecular imaging
Saura, Carlos A.	Associate Professor	Institute of Neuroscience, School of Medicine, UAB	carlos.saura@uab.cat	Biochemistry and Molecluar Biology/Neuroscience	Dpt Biochemistry and molecular Biology/Institute of Neuroscience	Genomics, proteomics i bioinformatics	Gene transcriptional mechanisms in neurodegeneration and Alzheimer´s disease
Marc Torrent Burgas	Associate Professor	Biochemistry Department, Biosciences Faculty, Building C	marc.torrent@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Regulació gènica, estructura i funció de macromolècules	Design of new antimicrobial therapies: The last time scientists discovered a novel class of antibiotics that would eventually make it to market was in 1984. At present, only 25% of the antibiotics in clinical development represent new classes of antibiotics, and none of them has even the potential to work against the most dangerous pathogens. In this scenario, by 2050, more people will die from antibiotic resistance than from cancer. My group aims to transform antibiotic discovery pipelines by seeking to disrupt host-pathogen complexes invoved in bacterial infection. For more information about our research: https://sites.google.com/site/marctorrentburgas/

Natalia Sanchez de Groot	Ramon y Caja fellow	Building C, office C2-327 Carrer la Vall Moronta 08193 Bellaterra (Barcelona)	natalia.sanchez@uab.cat	Biochemistry, Molecular Biology and Biomedicine	Biochemistry and Molecular Biology	Regulació gènica, estructura i funció de macromolècules	The PhD student will help to find a connection between microbiota and neurodegenerative diseases. Specifically, a connection with the aggregation prone proteins expressed by the gut microbiota. We use multidisciplinary approaches including bioinformatics, biophysical and in vivo models to analyse the prion-like behaviour of the proteins expressed by the gut microbiota and uncover its ability to transmit an aggregated conformation to the brain. We aim to discover bacterial strains, protein candidates and transmission mechanisms to inspire new treatments for neurodegenerative diseases.
Alicia Roque Córdova/Inmaculada Ponte Marull	Professora agregada/Professora Titular	Facultat de Biociències	alicia.roque@uab.es inma.ponte@uab.es	Biochemistry, Molecular Biology and Biomedicine	Department of Biochemistry and Molecular Biology	Gene regulation, structure and function of macromolecules	Regulation of histone H1 somatic variants and its alterations in cancer: There are seven variants of histone H1 differentially expressed in somatic cells. H1 variants are involved in the epigenetic regulation of chromatin structure and are often dysregulated in disease, in particular in cancer. Therefore, we are interested in studying the regulation of the expression of H1 variants and their role in cancer. Our proposal includes two main objectives. The first aim is to study of the post-transcriptional regulation of H1 variants by epitranscriptome modifications and RNA-binding proteins using genomic techniques such as me-RIP-seq and RIP. The second aim is to characterize the alterations of histone H1 variants in cancer by proteomic approaches and their molecular contribution to carcinogenesis.
Salvador Ventura	Full Professor	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	High resolution structure-based design of therapeutic and diagnostic molecules for Parkinson's disease (PD): The loss of dopaminergic (DA) neurons in the brain of PD patients compromises their motor and cognitive abilities. There is strong evidence connecting the aggregation of the protein a-synuclein (a-Syn) and the death of DA neurons. Converging studies indicate that early αSyn oligomers, rather than neuronal amyloid inclusions, are the actual pathogenic culprits, causing membrane disruption and neuron-to neuron spreading of the disease. Therefore, there is hope that molecules capable of selectively neutralizing toxic oligomeric species would attain clinical efficacy. A structure-activity relationship study allowed us to identify natural peptides which bind to αSyn oligomers with low nanomolar affinity without interfering with monomeric functional αSyn (DOI: 10.1038/s41467-021-24039-2). This activity is translated into an unprecedented anti-aggregation potency and the ability to abrogate αSyn oligomers toxicity for neuronal cells. We will use Cryo-Electron Microscopy, Solid State NMR and Single-Molecule Fluorescence techniques to solve the high-resolution structure of the peptide:oligomer complex, with the idea of evolving new peptidic variants that can be used for PD therapeutics and diagnostics.
Alex Peralvarez-Marin	Associate Professor	Biophysics Unit / School of Medicine	alex.peralvarez@uab.cat	Biochemistry, Molecular Biology, and Biomedicine	Biochemistry and Molecular Biology / Biophysics Unit	Molecular Biophysics and Biomedical Applications	We are characterizing the structure-function-interaction relationships of mammalian neuropeptides to try to understand neuroscience-related neuropeptides in Alzheimer's disease, Parkinson's disease, stroke, and neurodegeneration. We are looking for a highly motivated PhD candidate willing to combine experimental and computational methods to solve neurosciences puzzles. For latest publications check: https://scholar.google.es/citations?user=jP4TJKkAAAAJ&hl=en ORCID: 0000-0002-3457-0875
Bioinformatics							
Miquel Angel Senar	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	miquelangel.senar@uab.es	Bioinformatics	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Assessment of the biodiversity using metagenomics approaches. This topic relates to the analysis and development of efficient and accurate software tools that can be used to identify and to assess the relative abundance of species in complex DNA mixtures.
Margarida Julià-Sapé	Senior Lecturer	Biochemistry Department, Biosciences faculty	Margarita.Julia@uab.cat	PhD in 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
Biotechnology							
Gregorio Álvaro Campos	Associate Professor (Professor agregat)	Engineering School, Campus UAB, Universitat Autònoma de Barcelona	gregorio.alvaro@uab.cat	Biotecnologia (Biotechnology)	Departament of Chemical, Biological end Environmental Engineering	Biocatalysis, Multi-enzymatic biotransformations, Biocatalyst engineering and Enzymes production	Intensification of enzymatic production of building blocks for the next-generation bio-based polymer
Gregorio Álvaro Campos	Associate Professor (Professor agregat)	Engineering School, Campus UAB, Universitat Autònoma de Barcelona	gregorio.alvaro@uab.cat	Biotecnologia (Biotechnology)	Departament of Chemical, Biological end Environmental Engineering	Biocatalysis, Multi-enzymatic biotransformations, Biocatalyst engineering and Enzymes production	Enzymatic process for sustainability and circularity: cotton biobleaching using textile waste streams
Arben Merkoçi	Professor ICREA i Investigador Principal del grup Nanobioelectronics and Biosensors	Campus UAB, building ICN2, 08193 Bellaterra, Barcelona, Spain	arben.merkoci@icn2.cat	Biotechnology	Nanobioelectronics and Biosensors Group / Catalan Institute of Nanoscience and Nanotechnology	Nanobiosensors design and applications	The idea of this PhD Thesis project is to develop innovative nanobiosensors for clinical diagnostics. This is a multidisciplinary project that will involve the research and study of new nanomaterials (ex. graphene and other 2D materials etc.) with interest to design and fabricate new (bio)sensing platforms. The candidate with experience in experimental science and engineering (ex. in material science, chemistry, electronics, communication systems & IoT, biotechnology or related fields) will be working in a multidisciplinary group with the idea to innovate and further strengthen the biosensing technologies developed in the group. For more info see: www.nanobiosensors.org
Cell Biology							
Ignasi Roig Navarro	Professor Agregat	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)	Use of CRISPR-Cas9 technology to identify novel genes required for gametogenesis in mammals.	The project aims to identify novel genes required for the proper development of mammalian gametogenesis. Our previous investigations have uncovered unannotated genes that are preferentially expressed in the gonads. Using in vivo transfection of tagged-versions of these genes, we have demonstrated that their proteins localize in the nuclei of spermatocytes. Using CRISPR-Cas9, genetics, molecular biology, and cell biology tools we will reveal the functions of these novel genes in spermatogenesis and oogenesis. The success of this project will help to better understand the origins aneuploidy and infertility in humans.
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 examine whether chromatin interactions are conserved in distantly related vertebrate clades (reptiles and fish). 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.
Chemistry							
Jordi García Antón, Roger Bofill Arasa	Professor Agregat (Associate Professor)	Office C7/325.1 (Dr. Jordi GA) and Office C7/331 (Dr. Roger B.), Unitat Química Inorgànica, Dept. Química, Facultat de Ciències, Universitat Autònoma de Barcelona, 08193, Bellaterra (Barcelona), Spain	Jordi.GarciaAnton@uab.es Roger.Bofill@uab.cat	Chemistry	Chemistry	Nanomaterials for Energy Applications: Catalysis for the Obtention of Solar Fuels	Synthesis and characterization of isolated or supported metallic or metal-oxide nanoparticles for energy applications: (photo)catalytic transformations for the obtention of solar fuels (hydrogen evolution, carbon dioxide reduction reactions) and, additionally, for the reduction of nitrogen. Website: https://seloxcat.wordpress.com/
Gregori Ujaque	Professor Titular	Dep. Chemistry, UAB, Cerdanyola del Valles, 08193, Barcelona, Catalonia, Spain	gregori.ujaque@uab.cat	Chemistry	Department of Chemistry	Nanocatysis	(a) Design of nanodevices for catalysis and molecular recognition (Supramolecular catalysis). (b) New catalysts generation for adressing synthetic challenges and chemical waste.
Manel del Valle	Full Professor	Department of Chemistry, Faculty of Sciences	manel.delvalle@uab.es	Chemistry	Chemistry	Nanobiosensors	Molecularly imprinted chemical sensors to build electronic tongue analysis systems.
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	Functional Materials and Organic Reactivity	The aim of PhD project will be the development of electro- and photoresponsive molecular materials for the fabrication of smart devices (sensors, energy-saving windows, luminescent displays and anti-counterfeiting marks).

Prof. Dr. Daniel Maspoch	ICREA Research Professor and Head of the Supramolecular NanoChemistry & Materials Group (NANOUP)	Edifici ICN2 - Campus UAB 08193 Bellaterra	daniel.maspoch@icn2.cat	Chemistry	Institut Català de Nanociència i Nanotecnologia (ICN2)	NanoChemistry and Nanomaterials - Metal-Organic Frameworks	The Group's research interests are focused on controlling the assembly -Supramolecular Chemistry- of molecules, metal ions and nanoparticles for the creation of functional nanostructured materials -Nanotechnology- with empty spaces; and use them to encapsulate, store, separate, react and deliver molecules of interest. Specifically, our main contributions are in the fields of nanoporous Metal-Organic Frameworks (MOFs), Covalent-Organic Frameworks (COFs), Metal-Organic Polyhedra (MOPs) and Delivery Systems for applications in myriad areas, including Energy, Catalysis, the Environment, Encapsulation, and Life Science. Within the last years, the group has published more than 50 scientific papers in prestigious international journals (Chem. Soc. Rev., Nature Chemistry, Nature Communications, Adv. Mater., JACS, Angew. Chem. Int. Ed., among others).
Maria Isabel Pividori Gurgo	Professor/Catedràtica d'universitat	Departament de Química/Unitat de Química Analítica Edifici Cn · despatx C7-245 · carrer dels Til·lers Campus de la UAB · 08193 Bellaterra (Bellaterra) · Barcelona · Spain https://isabelpividori.net T +34 93 581 1976	isabel.pividori@uab.cat	Chemistry	Chemistry Department	Rapid Diagnostic Tests for the early diagnosis of non-communicable diseases based on exosomes. Keywords: i) exosomes; ii) bioanalytical chemistry, rapid diagnostic tests iii) analytical bioinstrumentation, biosensors, genosensors, immunosensors, DNA chips, lateral flow assays iv) nanobiomaterials, metallic nanoparticles, magnetic nanoparticles, oriented immobilization of biomaterials in nanomaterials Further details about research lines can be found in https://isabelpividori.net/research/	Rapid Diagnostic Tests for the early diagnosis of non-communicable diseases based on exosomes This proposal is related to the development of rapid tests (RDTs) to meet the features for RDTs summarized under the acronym ASSURED by the WHO (Affordable; Sensitive; Specific; User-friendly; Rapid and Robust; Equipment-free; and, Delivered to those who need it) for different applications, but specially for inflammatory biomarkers and cancer. Novel biomarkers as is the exosomes will be exploited for improving the clinical diagnosis and prognosis of different non-communicable conditions. Recently, our research group have developed our own technologies for the separation and detection of exosomes from different nature (breast cancer, osteoblastic, neuronal) from complex biological matrix. Accordingly, this proposal will address three major technological challenges that have been identified as technology bottleneck for the use of novel biomarkers as in RDTs. The first one is related to the specificity in the isolation of the biomarker from complex matrices. To achieve that, a rational study of the biomolecules will be performed, followed by the isolation by novel solid-phase preconcentration strategies and advanced materials including magnetic molecularly-imprinted polymeric particles. The second one addresses the increase in the sensitivity using strategies for the simultaneous amplification and tagging of overexpressed transcripts by ultrasensitive isothermal approaches. Finally, in all instances, analytical simplification will be implemented in order to minimize pipetting, washing steps and manipulation of reagents to provide analytical tools requiring minimal training for final users, but without any loss in the analytical performance. Biosensors and Lateral flow tests will be considered as prominent RDTs technologies based on electrochemical and optical readout, respectively, which can operate under minimal technical requirements in scarce-resource settings. The application that are envisaged includes targets affecting global health. All the developed strategies will assess a coherent business-focused analysis of research and innovation bottlenecks and opportunities to current and future societal challenges related with health and wellbeing. The SPECIFIC OBJECTIVES are as follows: O1 Defining the needs of novel biomarkers based on exosomes in RDTs for the diagnosis of communicable and non-communicable diseases. O2 Defining the technological specifications for the specific isolation of exosomes, in order to prevent interference of free receptors in biological fluids. O3 Assessing the biomarkers present in the exosome membrane for the specific isolation and detection of exosomes by RDTs directly from the clinical samples. O4 Interfacing solid-phase preconcentration strategies and advanced materials in RDTs for exosomes. O5 Defining the technological specifications in order to enhance the sensitivity for the detection of exosomes in RDTs. O6 Studying the overexpression of the genetic material in the exosomes to increase the sensitivity for the detection for communicable and non-communicable diseases. O7 Integrating amplification techniques on genetic material presents as cargo in exosomes. O8 Designing RDTs for the early detection of communicable and non-communicable diseases based on exosomes.
Manuel Valiente	Full Professor	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	manuel.valiente@uab.cat	Chemistry	Chemistry	Food Chemistry for food safety	The wine market has changed dramatically in the last fifty years, moving from small national markets, to the globalized web revolution being threatened by counterfeit products. The main focuss of the work will be the use of a novel combination of Plant Protection Products to improve the productivity of vineyards. Grapes will be cultivated by using tested products that reduces plant stress, increasing the productivity. Chemical parameters will be analyzed on grapes and vineyards to control the quality and also to identify those indicators that ensure traceability.
Manuel Valiente	Full Professor	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	manuel.valiente@uab.cat	Chemistry	Chemistry	From environmental pollution to circular economy	Mining wastes are not only a problem but a metal value source. Critical Raw Materials, such as Ge, W, Sb and Co are of strategic importance for the worldwide industry. The studies to develop will include the characterization and selection of nano sorbents, to implement a reagentless process, based on thermosorption/desorption, to recover the high value metals from mining wastes. Will learn and use techniques as ICP-MS, LC-MS, HPLC, AF4 (for nanophases analysis), GC-MS, SEM, TEM, Calorimetry and Sinchrotron Radiation. It will be implemented in a pilot plant for process demonstration
Manuel Valiente	Full Professor	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	manuel.valiente@uab.cat	Chemistry	Chemistry	Chemical Speciation to cancer research	Micronutrients are essential for maintaining a good human health even though they are only required in trace amounts. One of such micronutrients is selenium (Se) which plays an important role in the immune system. The proposed thesis will be focused on the speciation of selenium compounds as a cocktail to treat breast or skin cancer. Developed in collaboration with Hospitals of Barcelona and International institutions including Karolinska Institute (Sweden) and University of Innsbruck (Austria). Will learn and use techniques in Synchrotron facilities and in laboratory as ICP-MS, HPLC, UV... as needed.
Montserrat López Mesas	Associate Professor (Tenure Professor)	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	montserrat.lopez.mesas@uab.cat	Chemistry	Chemistry	Chemical Speciation to functional food	About 3 billion people worldwide are affected by low intakes of the essential nutrient selenium (Se). Inadequate dietary Se intake is related to the risk of developing chronic degenerative diseases. In the present study, Se will be applied directly to the plant via foliar application, and the study of the Se species will be performed at different stages of the plant maduration and in the different parts of the plant. Will learn and use techniques in Synchrotron facilities and in laboratory as ICP-MS, HPLC, UV... as needed. The study is part of a project where cows will be feeded with the plants to study the uptake of the Se on the milk that will follow dairy products, in particular cheese.
Montserrat López Mesas	Associate Professor (Tenure Professor)	Faculty of Science, Campus UAB, Bellaterra 08193, Barcelona, Spain	montserrat.lopez.mesas@uab.cat	Chemistry	Chemistry	Environment pollution of micro and nanoplastics	Have you ever considered the quantity of plastic that surrounds you? Nanoplastics (NPLs) are the product of continuous physical and chemical weathering of plastic in the environment. They can act as pollutant carriers and trespass the blood-brain barrier, releasing the pollutants into the organism. This project will be focused in the development of new and innovative methodologies to detect and quantify NPLs in several matrixes, by the use of sophisticated techniques as AF4-MLS-UV or GPC-UV... as well as, study their adsorption capacity towards inorganic and organic pollutants by ICP-MS or GC-MS respectively.
Rosario Núñez	Investigador Cientific CSIC	Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, 08193 Bellaterra (Barcelona)	rosario@icmab.es	Chemistry	Materials Moleculars y Supramoleculars	Highly Stable and Luminescent Carborane Based Fluorophores for Optical Applications	The PhD project will deal to prepare highly luminescent materials and to tune their structures and properties, both in solution and solid state. Unique icosahedral boron clusters-based luminophores will be synthesized and their properties (luminescence, thermal and chemical stability, etc) will be studied to provide materials for optical and biomedical applications. See some example: Biomat. Sci., 2019, 7, 5324-5337, https://doi.org/10.1039/C9BM00903E; Inorg. Chem Front. 2020, 7, 2370, https://doi.org/10.1039/D0QI00127A; Biomat. Sci, 2021, 9, 5691-5702, https://doi.org/10.1039/D1BM00730K. The student will learn to work with Schlenck techniques (vacuum-nitrogen lines, glovebox), use different characterization techniques: Infrared Spectroscopy (IR-ATR), Nuclear Magnetic Resonance (RMN), X-Ray diffraction, thermogravimetric analysis (TGA), TEM, DLS, UV-vis, fluorescence spectroscopy, among others. The PhD student will interact with other expert groups (physics, biologists and theoreticians) to evaluate the incorporation of the molecules into devices or to explore as fluorescence probes for bioimaging.
Carolina Gimbert Suriñach	Ramón y Cajal Researcher and Professor	Chemistry Department, Edifici C, Campus UAB 08193 Bellaterra (Cerdanyola)	carolina.gimbert@uab.cat	PhD in Chemistry	Chemistry Department	Molecules and materials for solar fuel energy and organic reactivity	Molecules and materials for H^+/CO_2 uptake and reactivity: preparation and characterization of functional organic materials with enhanced affinity to CO_2 and water and with the ability to convert them to high energy products such as hydrogen or methanol.
Computer Science							
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, GPU 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, GPU compression.
Blum, Christian Clemens	Investigador Científico I	IIIA-CSIC, Campus UAB, Carrer de Can Planas, Zona 2, 08193 Bellaterra	christian.blum@csic.es	Computer Science (Doctorat en Informàtica)	IIIA-CSIC	Artificial Intelligence	Metaheuristics are approximate techniques for optimization. Examples include evolutionary algorithms, ant colony optimization, and tabu search. Recent research deals with the use of machine learning and deep learning for leveraging metaheuristics, especially in the context of large-scale problem instances which are hard to be solved. The goal of this thesis proposal is to make algorithmic progress in this exciting field of research in the context of hard optimization problems related to sustainability.
Eduardo César	Titular d'Universitat	Carrer de les Sitges. School of Engine	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 Biological Systems.
Anna Sikora	Agregada	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 engine	Auto-tuning of environmental HPC applications. The goal is to analyze environmental HPC applications and indicate/apply possibilities of their automatic and dynamic tuning.
Miquel Angel Senar	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	miquelangel.senar@uab.es	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Data management challenges in genomic applications. This topic relates to the study and design of mechanisms and strategies that can be applied in advanced HPC systems by genomic applications with large demands of data processing. Target computing systems will consist in heterogeneous platforms, combining multicore processors and accelerators (GPUs), combined with parallel file systems; and target applications will focuss on genome analysis tools that are applied to metagenomics problems.
Tomàs Margalef	Catedràtic d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	tomas.margalef@uab.es	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Performance Engineering of computational science applications: The goal is to design and develop environmental applications (forest fire, meteorology, climate modeling) exploiting advanced HPC architectures (Multi/many core processors, accelerators, GPUs, ...).
Ana Cortés	Titular d'Universitat	Carrer de les Sitges. School of Engineering. Universitat Autònoma de Barcelona. 08193 Cerdanyola del Vallés.	ana.cortes@uab.es	Computer Science	Computer Architecture and Operating Systems	High Performance Computing Applications for science and engineering (http://grupsderecerca.uab.cat/hpca4se/en)	Edge Computing for near real time forest fire spread prediction. This topic is oriented to compute the evolution of extreme fires in situ, by gathering the data required from the on going hazard environment and taking advantage of unnamed aerial vehicles and low consumption GPUs.
Antonio Manuel López Peña	TU Computer Science Department & ICREA Academia & Principal Investigator at Computer Vision Center (CVC)	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	antonio@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Technological Innovation: Development of Semi-Supervised Learning (SSL) techniques for synthetic-to-real unsupervised domain adaptation of deep-learning models in the field of autonomous driving. Abstract of the related project, named as SSL-ADA: The curse of data annotation, i.e., augmenting raw sensor data with ground truth, is a major bottleneck for developing deep perception models. This problem is especially exacerbated in autonomous driving due to its multimodal sensor suites. We could say that data is the driver in autonomous driving, but only if these data comes with proper annotations. In practice, large production teams of well-trained human oracles are required to annotate the raw sensor data. Alternatively, we can leverage automatically annotated data from virtual environments, being these data generated four orders of magnitude faster than by human oracles, as well as being more accurate and richer. However, still there is not a universal solution for the domain shift between virtual and real-woporation of the molecules into devices or to explore as fluorescence probes for bioimaging.es will be performed, followed by the isolation by novel solid-phase preconcentration strategies and advanced materials including magnetic molecularly-imprinted polymeric particles. The second one addresses the increase in the sensitivity using strategies for the simultaneous amplification and tagging of overexpressed transcripts by ultrasensitive isothermal approaches. Finally, in all instances, analytical simplification will be implemented in order to minimize pipetting, washing steps and manipulation of reagents to provide analytical tools requiring minimal training for final users, but without any loss in the analytical performance. Biosensors and Lateral flow tests will be considered as prominent RDTs technologies based on electrochemical and optical readout, respectively, which can operate under minimal technical requirements in scarce-resource settings. The application that are envisaged includes targets affecting global health. All the developed strategies will assess a coherent business-focused analysis of research and innovation bottlenecks and opportunities to current and future societal challenges related with health and wellbeing. The SPECIFIC OBJECTIVES are as follows: O1 Defining the needs of novel biomarkers based on exosomes in RDTs for the diagnosis of communicable and non-communicable diseases. O2 Defining the technological specifications for the specific isolation of exosomes, in order to prevent interference of free receptors in biological fluids. O3 Assessing the biomarkers present in the exosome membrane for the specific isolation and detection of exosomes by RDTs directly from the clinical samples. O4 Interfacing solid-phase preconcentration strategies and advanced materials in RDTs for exosomes. O5 Defining the technological specifications in order to enhance the sensitivity for the detection of exosomes in RDTs. O6 Studying the overexpression of the genetic material in the exosomes to increase the sensitivity for the detection for communicable and non-communicable diseases. O7 Integrating amplification techniques on genetic material presents as cargo in exosomes. O8 Designing RDTs for the early detection of communicable and non-communicable diseases based on exosomes.
Carlos Alejandro Parraga	Associate Professor (Professor Agregat) Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	Alejandro.Parraga@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Aesthetics is the discipline concerned with the study of beauty and its appreciation. A typical goal in Computer Science is to predict observer's perceptions when presented with visual stimuli and in the case of beauty, the goal is to predict the judgments of observers when exposed to natural images. The complexity of the problem requires restricting the characteristics of these natural images to include ony a subset that are evaluated by lower level cortical mechanisms. This project will start by applying a computational simulation of the visual cortex to images and extracting the most relevant features from its low-level cortical operators. We will then use machine learning techniques to learn these features and conduct judgement preditions. The results will be tested on a database of aesthetically-evaluated natural scenes. The methodology of this project is multidisciplinary (computational neuroscience, psychophysics, computer vision).
Carlos Alejandro Parraga	Associate Professor (Professor Agregat) Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	Alejandro.Parraga@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Existing computational approaches to predict visual discomfort are based on a fundamental principle that visual systems have evolved to optimally perceive the environment through selective pressure. Computational characterizations of uncomfortable visual stimuli are all based on a mathematical quantification of departure from the 1/f^2 statistics of natural scenes using Fourier analysis and the assessement of mechanistic computational models of the visual cortex in response to achromatic images. This project will study the link between second and third-order statistical manipulations of natural scenes eliciting both strong negative aesthetic judgements and visual discomfort. The methodology of this project is multidisciplinary (computational neuroscience, psychophysics, computer vision).
Carlos Alejandro Parraga	Associate Professor (Professor Agregat) Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	Alejandro.Parraga@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Image difference prediction refers to the quatification of perceived (subjective) difference between pairs of images. This is a very important subject in disciplines as different as image compression, graphics, virtual reality, aesthetics, etc.Most of the work so far has focused on difference prediction "at threshold", i.e. between pairs of images that are very similar. We want to expand the scope of this study to include images that are fundamentally different ("suprathreshold"). This project will start by applying a cortical model of visual discrimination to pairs of images to obtain the activity of visual cortical neurons when comparing the images in question. We will then apply machine learning techniques to the model's output to predict observer's difference judgements. The methodology of this project is multidisciplinary (computational neuroscience, psychophysics, computer vision).
Carlos Alejandro Parraga	Associate Professor (Professor Agregat) Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	Alejandro.Parraga@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Observers use several visual cues to perceive and rate the symmetry of natural scenes. The problem of predicting these ratings is still unsolved from a computational point of view. Moreover, there is evidence that symmetry is an important predictor of aesthetic value for natural scenes. We will tacle the problem from several different fronts, using image processing and machine learing techniques to extract the simmetry (both local and global) of objects in natural images and compare these with the ratings produced by human observers in a variety of conditions. The methodology of this project is multidisciplinary (computational neuroscience, psychophysics, computer vision).

Maria Vanrell Martorell	Full Professor Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	maria@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Understanding and Visualizing trained deep CNNs using selectivity indexes Everyone knows the high performance of Convolutional Neural Networks (CNNs) in solving computer vision problems; however, there is a lack of understanding on how the networks achieve such a performance. In this thesis project we propose to use: (a) selectivity indexes of different natures, like class, concept, colour, or texture; and (b) individual neuron visualizations to understand intermediate representations. In this way we can build generic methodologies to open the black box that any trained CNN has been up to now and make that this understanding can be used to improve the training and consequently the performance. The deeper is the understanding the better is going to be the result.
Maria Vanrell Martorell	Full Professor Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	maria@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Open, analyse and change black-box trained deep CNNs to improve their properties Everyone knows the high performance of Convolutional Neural Networks (CNNs) in solving computer vision problems; however, there is a lack of understanding on how the networks achieve such a performance. In this thesis project we propose to define: (a) similarity and relevance indexes that allow to understand how the neurons cooperate between them; and (b) use the previous indexes to condition their training and learn about the individual neuron tasks. In this way, we can prune useless neurons or make them more useful and achieve more sustainable networks. Thus, they can be embedded in autonomous systems without affecting their performance.
Maria Vanrell Martorell	Full Professor Computer Science Department & CVC Senior Researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	maria@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Smart image editing using deep CNNs Everyone knows the high performance of Convolutional Neural Networks (CNNs) in solving computer vision and computer graphics problems; one special kind of these networks are those than generate a new version of the input image adding a smart change, like the same scene under different light conditions, or the same football team with different t-shirt colours, etc. In this thesis project we propose to build Deep CNN architectures with constraints that separate intrinsic physical properties that can be manipulated independently to reconstruct new smarter versions of the same image by partially modifying the estimated intrinsic components.
Joost van de Weijer	CVC Senior Researcher & Professor Computer Science Programme UAB	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	joost@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Continual learning: many algorithms are learned based on the assumption that the algorithm has access to all the data when learning. In Continual Learning we assume that a learner has access to a sequence of tasks, and during the learning of new tasks it has no access to data of previous tasks. Coninual learning is believed to be a crucial property of future artificial learning systems. The project will be done in the LAMP group in the Computer Vision Center; the group is one of the leading groups in Europe on this topic.
Ernest Valveny	Associate professor CVC Senior Researcher/ Ramon y Cajal researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	ernest@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center		Multilingual Scene Text Visual Question Answering: Visual Question Answering has become a key task in the "vision and language" field over the past decade. Scene Text VQA emerged as a specific VQA branch, introduced by the host group of this PhD candidature. The aim of Scene Text VQA is to answer questions that require to be able to read and understand the text that appears in the image in the context provided by the visual information. Most Scene Text VQA systems only consider English text both in images and questiona. However, we live in a multilingual world and thus, in a realistic scenario, images and questions can contain text in any language. The prospective student will work on developing methods to address the multilingual challenge in the Scene Text VQA scenario, by creating models that are able to reason about an image given a question and a set of recognized text instances in any language. The work will be based on leveraging advancements in automatic word translation without paired data to creMol Biol Evol 36 (8), 1686-1700; Waters and Ruiz-Herrera (2020) TiG 36(10):728-738; Vara et al. (2021) Nature Communicat
Dimosthenis Karatzas	Associate professors & CVC Senior Researchers	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	dimos@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Reading Systems for Document Visual Question Answering (DocVQA): Document Visual Question Answering, as introduced by the host group of this PhD prososal, emerges as a zero-shot alternative to traditional information extraction on documents typically based on a fine grained classification of the input document, followed by specific (typically handcrafted) information extraction processes, which are difficult to generalize to other types of never-before-seen documents. The goal in DocVQA is to extract information about the documents by answering questions that require being able to understand the complex and rich document content and layout structure (text, tables, figures, etc.) The prospective PhD student will focus on the development of novel methods for Document Visual Question Answering, addressing some of the challenges and limitations of current methods: multipage documents (that require to integrate reasoning about the context of the whole document to answer the question), explainability (that impliesporation of the molecules into devices or to explore as fluorescence probes for bioimaging.es will be performed, followed by the isolation by novel solid-phase preconcentration strategie
Lluís Gómez	Associate professor CVC Senior Researcher/ Ramon y Cajal researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	dimos@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Video Text Visual Question Answering: The existing models for Video Visual Question Answering ignore the scene text information, although it is often necessary to provide a correct answer. Creating new models for text-based Video VQA implies new, different problems with respect to the case of VQA for still images. In this PhD proposal we aim to explore text-based Video VQA as a novel task, in which answering questions about a given video requires to understand scene text instances within it. The PhD work will tackle this problem in two levels. First, doing basic research on novel systems for text tracking and anytime scene text recognition combining evidences over time. Subsequently, designing new models for text-based Video VQA leveraging textual and visual cues.
Lluís Gómez	Associate professor CVC Senior Researcher/ Ramon y Cajal researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	dimos@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Multimodal Image Understanding: Multimodal data representation learning is a fundamental technique to integrate data of different types that are helpful for image understanding. Multimodal representations (visual and textual) provide richer information than a single modality by taking advantage of the specific information of each modality. This is specially relevant in data that is multimodal by nature -- such as social media content that usually includes images and text --, with multiple applications such as fine-grained image classification, cross-media retrieval or the analysis of social media (for instance, detection of hate speech messages or fake news). The prospective PhD student will work in designing and training deep neural network models to extract rich representations from multimodal publications, combining both visual and textual information in the message, including scene text that appears in the image. The PhD work will explore different approaches. On one hand, a cross-modal approach, whereporation of the molecules into devices or to explore as fluorescence probes for bioimaging.es will be performed, followed by the isolation by novel solid-phase preconcentration strategies and advanced materials including magnetic molecularly-imprinted polymeric particles. The second one addresses the increase in the sensitivit
Ernest Valveny	Associate professors & CVC Senior Researchers	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	dimos@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Reading systems for embodied interaction: Systems that successfully interact with the man-made world around us need to be able to read and understand written information in real scenes (e.g. product names and prices in order to purchase products in a super market, or signs to find ones way in the city). This PhD proposal will research in embodied multimodal learning in scenarios that require locating and extracting written information in an interactive manner.
Dimosthenis Karatzas	Associate professor CVC Senior Researcher/ Ramon y Cajal researcher	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	dimos@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational Models for Artificial Vision	Deep Learning for Computer Vision. Computer vision is an area of machine learning dedicated to analyzing, understanding, and interpreting images. It is used to teach computers to use visual information to perform visual tasks that humans can do in their daily lives. In recent years, deep learning has revolutionized this field of artificial intelligence and enabled the creation of more accurate and complex models. The prospective PhD student will work on the design of new models for computer vision with the aim of advancing the state of the art.

Luis Herranz	Senior researcher CVC	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	lherranz@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational models for artificial vision	Beyond sustainable/green AIAfter a decade of continuous technological breakthroughs, AI is often hailed as the holy grail to address the ecological crises (i.e. sustainable/green AI). This optimism, however, is countered with an increasing concern about the environmental impact of deep learning (the powerhouse behind recent AI's progress), whose ever-increasing computational cost results not in less but in more resource and energy demands, compounded by the pervasive deployment of machine learning (e.g. smartphones, vehicles, robots, wearable devices). Computer vision is arguably the most demanding field, due to the heavy nature of visual information (e.g. images, videos). As an instance, rebound effects are a well-known consequence of increased technological efficiency, resulting from increased ecological impact due to efficiency creating a larger aggregate demand. Sustainable/green approaches to deep learning often focus on algorithmic efficiency while not widening the view to consider rebound effects. In 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.roposal will include the following work packages: 1. Analysis of the pig liver transcriptome by RNA-Seq in 250 pigs with phenotypic records for growth, immunity and meat quality. Study of differentially expressed genes, new genetic variants, genomic regions regulating liver gene expression, and gene expression networks. 2. Analysis of the transcriptome data and productive records using system biology approaches to identify metabolic pathways, regulators, biomarkers, genes and polymorphisms involved in energy homeostasis and affecting both health and productive traits. 3. Functional validation of relevant genetic variants in candidate genes by cell transfection luciferase reported assays, ELISA assays of protein activity, chromatin immunoprecipitation assays, and epi
Luis Herranz	Senior researcher CVC	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	lherranz@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational models for artificial vision	Responsible artificial intelligence/computer vision (AI/CV)The increasing dependence of our lives on machine learning models taking automated decisions brings the crucial concern about accountability, especially in the case of failures and harmful decisions (e.g. an accident caused by a malfunctioning computer vision algorithm in an autonomous vehicle). Thus, a crucial requirement for governments and socially responsible AI/CV companies is ethical design with accountability mechanisms. This requires shifting from a black-box model paradigm to a white-box model where decisions can be monitored, as well as actively addressing uncertainty and bias at different stages, including (but not limited to) design choices, data collection and training processes. Objectives of the thesis project: a) critical analysis of the ethical ramifications of a variety of computer vision algorithms and scenarios, b) based on the previous analysis, propose architectural designs, techniques and data collection methodologies that proviporation of the molecules into devices or to explore as fluorescence probes for bioimaging.es will be performed, followed by the isolation by novel solid-phase preconcentration strategies and advanced materials including magnetic molecularly-imprinted polymeric p
Javier Vázquez Corral Luis Herranz	Associate Professor UAB Senior researcher CVC	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	jvazquez@cvc.uab.cat lherranz@cvc.uab.es	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational models for artificial vision	Color image and video enhancement by leveraging physical priors and deep learning Color image and video enhancement has been a problem of study for more than 40 years. Historically, enhancement methods were rooted in tailor-made priors (either physics or statistically-based), but in the last 10 years, with the appearance of deep learning approaches, the trend has switched. However, the black-box component of current deep learning methods, which does not allow the user to know what is happening in the failure cases, has hindered its wide deployment in some core imaging processes -such as in the camera image pipeline- in which understanding on what the algorithms are performing is paramount. Many enhancement and restoration problems are also severely ill-posed, such as colorization (e.g. every grayscale image has many possible colorized solutions), and physical priors can avoid unnatural solutions by enforcing the solution to be physically plausible. A possible solution to address the aforementioned problems ofMol 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.roposal will include the following work packages: 1. Analysis of the pig liver transcriptome by RNA-Seq in 250 pigs with phenotypic records for growth, immunity and meat quality. Study of differentially expressed genes, new genetic variants, genomic regions regulating liver gene expression, and gene expression networks. 2. Analysis of the transcriptome data and productive records using system biology approaches to identify metabolic pathways, regulators, biomarkers, genes and polymorphisms involved in energy homeostasis and affecting both health and productive traits. 3. Functional validation of relevant genetic variants in candidate genes by cell transfection luciferase reported assays, ELISA assays of protein activity, chromatin immunoprecipitation assays, and e
Javier Vázquez CorralLuis Herranz	Associate Professor UAB Senior researcher CVC	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	jvazquez@cvc.uab.cat lherranz@cvc.uab.es	Computer Sciences	Computer Science Department UAB & Computer Vision Center	Computational models for artificial vision	Explainable image and video restoration. Deep generative models (e.g. GANs) have revolutionized the field of visual enhancement and restoration. These models can transform old and degraded images into realistic reconstructions with vivid colors (even from black and white content). However, the underlying decisions in the restoration process are rarely understood, since they are simply based on implicit knowledge learned from observing large amounts of high quality images. This drawback is paramount, since visual enhancement problems are ill-conditioned, in some cases very severely (e.g. there are many plausible colorizations of a grayscale image). Explainability is the ability of the model to communicate to a human why a particular decision or solution was taken. In this PhD project we aim at endowing image/video restoration systems with the ability to explain their restoration decisions to humans in an intuitive and easily understandable format, who in turn can interact with the system in a more effective waporation of the molecules into devices or to explore as fluorescence probes for bioimaging.es will be performed, followed by the isolation by novel solid-phase preconcentration strategies and advanced materials including magnetic molecularly-imprinted polymeric particles. The second one addresses the increase in the sensitivity using strategies for the simultaneous amplification and tagging of overexpressed transcripts by ultrasensitive isothermal approaches. Finally, in all instances, analytical simplification will be implemented in order to minimize pipetting, washing steps and manipulation of reagents to provide analytical tools requiring minimal training for final users, but without any loss in the analytical performance. Biosensors and Lateral flow tests will be considered as prominent RDTs technologies based on electrochemi
Josep Lladós	Associate Professor UAB Senior researcher CVC	Computer Vision Center Edifici O - Campus UAB 08193 Bellaterra	josep@cvc.uab.cat	Computer Science	Computer Science Department UAB & Computer Vision Center	Computational models for artificial vision	Visual parsing in document intelligence by Graph Neural Networks (GNNs). Document Intelligence (DI) is focused on the reading, understanding and interpreting documents as invoices, forms, letters, diagrams… Language model (LM) architectures that NLP applies to text sentences, become a valid paradigm to be adopted by DI. LMs in DI can be backed by Graphs, that robustly represent objects and relations. Graph Representation Learning based on Graph Neural Networks (GNN) allows to define a computational framework to model the language of documents. The prospective PhD student will focus its research on (1) Learn graph-based language models able to perform task-agnostic architectures in document object recognition and information extraction (e.g. key-value association, table recognition...) (2) the development of neural program synthesis techniques in order to induce the compositional rules (via graphs) governing the structure of training layouts, synthesizing structurally plausible documents for data augmentationMol 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.roposal will include the following work packages: 1. Analysis of the pig liver transcriptome by RNA-Seq in 250 pigs with phenotypic records for growth, immunity and meat quality. Study of differentially expressed genes, new genetic variants, genomic regions regulating liver gene expression, and gene
Demography							
Albert Esteve Palós	Director, Centre d'Estudis Demogràfics	Ca n'Altayó, s/n, Edifici E2 Campus UAB, 08193-Bellaterra	demog@ced.uab.es	PhD Demography	Dep. Geography / Centre d'Estudis Demogràfics	Fertility and Households	The research line "Fertility and households" deals with aspects related to fertility and the formation and structure of households on a national and international scale. The methodological approach is mainly quantitative and comparative. Falling fertility, rising cohabitation, changes in marriage markets, and the transformation of households on a global scale are some of the topics most commonly studied in this research area.

Economics, Management and Organizations							
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	PhD Program in Economics, Management and Organizations	Departament d'Empresa	Innovation and Corporate Governance	Firms' growth usually implies the creation of corporations led by boards of directors. The composition, organization and structure of such boards is a relevant research topic. Special attention has been devoted to the differences of behavior between those boards controlled by members of the same family, developing a leading paradigm in the study of family business nowadays: the socioemotional wealth. A key element for maintaining the firms' competitiveness is innovation. We hold a large experience in the analysis of the determinants and consequences of the innovation policies and activities of firms. We propose the following broad topics: 1. Corporate ownership and governance: we will explore how increase in emphasis on one function (monitoring or resource provision) affects directors' ability to execute another function and its implications for corporate value creation. 2. Sustainable innovation: we seek to strengthen the analysis of the relationship between environmental innovations and firm performance. There is a debate about the extent to which these innovations, often forced by regulations, have a positive or negative impact on firm performance and survival.
Electrical and Telecommunication Engineering							
Marc Porti Pujal	Professor titular	Departament d'Enginyeria Electrònica. Edifici Q, Campus Universitat Autònoma de Barcelona, 08193. Bellaterra, Barcelona, Spain	marc.porti@uab.es	Electrical and Telecommunication Engineering	Electronic Engineering Department	Nanoscale and device level variability and reliability of emergent devices based on alternative technologies and/or materials for nanoelectronics.	The PhD student's work will be focused on the electrical properties (both at the nanoscale and/or and device level), variability and reliability of emergent devices as those based on 2D materials or TFTs, among others, which are of paramount importance for the nanoelectronics industry. 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 (USA, Germany, China...) 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.
Dr. 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	PhD in Electronic and Telecommunication Engineering	Telecommunications and System Engineering	Microwaves Engineering. Filters and Multiplexers for 5G/6G based on LNOI/LTOI .	Development of advanced RF-Filter synthesis techniques to cope with advanced topologies devoted to new spectrum requirements for 5G/6G (wide bandwidth and mmW frequencies) through advanced responses and the entanglement with functional materials. Train creative and innovative early-stage researchers through an intersectorial and interdisciplinary excellence and outstanding research programme.
Dr. 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	PhD in Electronic and Telecommunication Engineering	Telecommunications and System Engineering	Design and development of RF devices based on emerging functional materials (III-V Nitrides and LiNbO3) for 5G/6G.	Study of the performance of lateral excited and longitudinally coupled resonators (XBAR-CRF) to improve RF and microwave filter performance. Involve design and fabrication of resonators and filtering structures. Train creative and innovative early-stage researchers through an intersectorial and interdisciplinary excellence and outstanding research programme
Dr. 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	PhD in Electronic and Telecommunication Engineering	Telecommunications and System Engineering.	Microwaves Engineering. GaN PA and circulators for RF Front-End Very High Throughput Satellites.	5G is expected to operate at a very high data rate, which entails the need of a strong backhaul behind the base stations to transmit all the traffic generated by the user to the network. One of the better solutions to support this traffic as a complement to terrestrial networks (specially for large areas with less population) is to operate in the Ka band (26.5 to 40GHz), but also the use of Q/V band (30 to 75GHz) to increase the bandwidth offered by Ka bands, required at fixed infrastructure such the case of Gateways. Train creative and innovative early-stage researchers through an intersectorial and interdisciplinary excellence and outstanding research programme.
Ramon Vilanova	Full Professor	School of Engineering	Ramon.Vilanova@uab.cat	Electronics and Telecommunication Engineering	Telecomunications and Systems Engineering	Advanced Control Systems	Operation of wastewater systems with environmental impact considerations
Gonzalo Seco-Granados	Professor, Director of the Research Group on Signal Processing for Communications and Navigation	Engineering School Campus UAB 08193 Bellaterra	gonzalo.seco@uab.cat	Electronic Engineering and Telecommunications	Telecommunications and Systems Engineering	Communications, navigation and networking	Localization and Sensing with 5G/6G and Satellite-Based (LEO-PNT and GNSS) Systems The Internet of Things (IoT) has experienced great growth in recent years, with an estimated number of devices currently around 30 billion. At the same time, communications systems, in many cases of low-energy consumption, have been developed to meet the needs of data transmission of these devices. Once communication needs have been met, there is a growing and urgent demand for the calculation the position of such devices. This demand does not currently have a satisfactory technological response. A similar situation of lack of appropriate technological solutions is faced in the area of positioning for autonomous vehicles.The objective of this project is to contribute to the design of positioning solutions that are valid for IoT or autonomous vehicle environment. The innovations present in the latest versions of 5G and those being discussed for 6G will be exploited to design transmission mechanisms and algorithms that allow the calculation of the six components of position and orientation. Key elements will be the use of intelligent reflective surfaces and the availability of high-precision angular measurements even with low-bandwidth signals. In this thesis, we can also investigate on the positioning using signals coming from low-earth orbit satellites (LEOs), either from existing constellations, what is commonly referred to as signals of opportunity because they are not designed for positioning, or from a specifically-designed dedicated future constellation. In both cases, the use of LEO satellites provides the advantage of a higher signal power thanks to the shorter distance than the GNSS satellites. In addition, the specific design of signals can improve performance and simplify the operations performed by the receiver. Depending on the interests of the PhD candidate, the thesis will be focused on the 5G/6G systems or in LEO/GNSS systems.
Entrepreneurship and Management							
Diego Prior Jiménez	Full Professor	Department of Business, Faculty of Economics and Business Studies, 08193 Bellaterra (Cerdanyola), Barcelona, Spain	diego.prior@uab.cat	PhD Program in Entrepreneurship and Management (IDEM)	Department of Business	Efficiency Analysis, Accounting and Finance	Corporate governance, social and environmental responsability and long term financial performance of firms
Environmental Science and Technology							
Antoni Sánchez Ferrer	Full Professor	Dept. of Chemical Engineering, Engineering School	antoni.sanchez@uab.cat	Environmental Science and Technology	Dept. of Chemical Engineering, Engineering School	Use of advanced nanomaterials in environmental applications	Beyond biogas as renewable energy source:coversion to methanol to through metallic nanoparticles embedded in metal-organic frameworks (MOFs)
David Gabriel Buguña	Full professor	School of Engineering	david.gabriel@uab.cat	Environmental Science and Technology	Department of Chemical, Biological and Environmental Engineering	Biological treatment of liquid and gas effluents. Elimination of nutrients, odours and volatile organic compounds	Exploit the integration of the carbon, nitrogen and suflur cycles in bioreactors to design optimal treatment trains to recover added-value products out of liquid and gaseous effluents (www.recycles-h2020.eu)

Xavier Font Segura	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.	Nanomaterials for environmental engineering	In the framework of Circular Economy and Climate Change, anaerobic digestion is pointed as a key technology to contribute to our sustainability. Additives can be used to improve anaerobic digestion of organic substrates (energy crops, wastes …). Between them, nanoparticles have been recently tested to improve biogas production. The effect of nanoparticles on biogas production have been generally assayed in batch experiments at volumes of 500 to 1000mL. The goal of this proposal is to produce and characterize different types of nanoparticles (Fe, Co, Ni, …) test them in batch processes and select the best nanoparticles to perform anaerobic digestion in continuous mode at 5L scale.
Teresa Gea Leiva	Professor	C/ de les Sitges, s/n. 08193 Bellaterra, Barcelona	teresa.gea@uab.cat	Environmental Science and Technology	Department of Chemical, Biological and Environmental Engineering	Waste Bioconversion for a Circular Bioeconomy.	Our proposal deals with the bioconversion of waste materials to glycolipid biosurfactants through fermentation (submerged and solid-state) using yeasts. Project tasks are related to: insights on metabolic process basis for modelling and optimization; process optimization and scale up; novel techniques for downstream processing and product characterization; life-cycle and techno-economic assessments.
Materials Science							
Prof. Jordi Arbiol	ICREA Research Professor and Group Leader	Institut Català de Nanociència i Nanotecnologia (ICN2), Campus UAB, Edifici ICN2, Bellaterra, 08193 Barcelona, Catalonia, Spain	arbiol@icrea.cat	Materials Science	Institut Català de Nanociència i Nanotecnologia, ICN2	Advanced Electron Nanoscopy	Correlation of the structure and composition of nanomaterials at atomic scale with their electrocatalytic properties at the nanoscale. The nanomaterials and nanostructures studied will be related to new nanomaterials for energy applicattions: e.g.: 2D nanostructures, nanoparticles,...
Angel Perez del Pino	Manager of the "Laser Processing Research" Group at the Institute of Materials Science of	Carrer dels til·lers s/n, Campus UAB, Bellaterra 08193, Spain	aperez@icmab.es	Materials Science	Institute of Materials Science of Barcelona	Laser fabrication of carbon-based nanocomposites for supercapacitors	Innovative laser processing technologies will be developed for the synthesis of hybrid graphene-metal oxide electrodes to be used in the fabrication of asymmetric supercapacitors.
Jordi Faraudo Gener	Científico Titular del CSIC	ICMAB-CSIC, Dept Theory and Simulation of Materials, Campus UAB	jfaraudo@icmab.es	Materials Sciences	ICMAB-CSIC, Dept Theory and Simulation of Materials	Biomaterials Research Line at ICMAB	Atomistic modelling of materials for drug delivery applications. We propose a particular focus on anti-cancer drugs. Examples of our simulation works can be seen in our YouTUbe channel https://www.youtube.com/channel/UCkrTDh1VQw06o0dzPcF2NqA
Dr. Raphael Pfattner	Investigador Ramón y Cajal	Instituto de Ciencia de Materiales, (ICMAB-CSIC), campus de la UAB	rpfattner@icmab.es	Ciencia de Materiales	NANOMOL/Instituto de Ciencia de Materiales, (ICMAB-CSIC)	Molecular Electronics RL4	Organic Electronics for Electronic Skin Applications
Xavier Torrelles Albareda	Investigador Científic	ICMAB; Campus UAB; 08193 Bellaterra	torrelles@icmab.es	Ciencia Materials / Electroquímica	ICMAB-CSIC	Catalysis: water dissociation for hydrogen production	Titanium oxide is of interest, among other reasons, for the photovoltaic conversion of light into electricity. One factor that limits the usefulness of titania for these applications is its band gap. A second factor is related to its active surface since its efficiency is proportional to it. A third factor is the limited knowledge and restricted availability of anatase (A) -TiO2 (001) surfaces, considered the most active titania surface for photoelectrochemical water separation applications. These surfaces cannot be synthesized in laboratories as single crystals and are very rare in nature. The bottleneck that supposes the access to monocrystalline surfaces of A-TiO2 (001) will be overcome by synthesizing highly ordered anatase(001) films using the PLD technique. The optimal bandgap will be adjusted by reducing the oxygen stoichiometry in the films by annealing treatments under UHV conditions. Finally, the improved catalyst will be functionalized by depositing or partially covering its surface with also catalyst oxides to increase its efficiency. TiO2 films can also be grown by forming heterostructures with other oxide catalysts to increase their efficiency. The objectives are, firstly, to synthesize high-quality epitaxial titania films to use these surfaces as a model system, and secondly, to grow these titania phases on ferroelectric oxides using PLD to improve their efficiency as a catalyst: water dissociation process. Conventional and advanced characterization (synchrotron) will be used to figure out some of the structural and electronic properties of this system in relation to its photocatalytic behaviour.
Judith Guasch	Ramón y Cajal researcher (ICMAB-CSIC) and Group Leader of a Max Planck	ICMAB-CSIC - Campus UAB; Til·lers, s/n; 08193 Bellaterra (Barcelona, Spain)	jguasch@icmab.es	PhD in Materials Science (UAB)	Chemistry	Dynamic Biomimetics for Cancer Immunotherapy	Development of biomimetic tissues based on bionanomaterials for cancer immunotherapy
Dr. Imma Ratera	Professor at the Materials Science Doctorate Programm of the UAB and Titular Researcher at CSIC (ICMAB)	Nanomol Group/Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB	iratera@icmab.es	Materials Science	ICMAB-CSIC; Department of Molecular Nanoscience and Organic Materials (NANOMOL)	Chemistry: Multifunctional Molecular Materials	Multifunctional Organic radical nanoparticles for intracellular nanothermometry. In the frame of a big collaborative European project (Micro4Nano), the work will consist on the design, preparation and characterization of molecular multifunctional materials based on organic radicals for the preparation of organic nanoparticles (ONPs) for 2-Photon Absorption Microscopy (2PM) and nanothermometry. Structural and optoelectronic characterization of the ONPs will be addressed by appropriate spectroscopic (absorption, emission and non-linear optical), microscopic and calorimetric techniques towards a promising research with impressive applicative implications in the field of bioimaging and biomedicine. (J. Mat. Chem. C, 2021, 33, 10610)
Juan Sebastian Reparaz	Cientifico Titular (ICMAB)	Instituto de Ciencia de Materiales de Barcelona (ICMAB-CSIC) - Campus UAB, Calle Tillers s/n	jsreparaz@icmab.es	Material Science	Instituto de Ciencia de Materiales de Barcelona (ICMAB-CSIC)	Thermal Transport in Condensed Matter.	Development of advanced high resolution imaging methodologies to study nanoscale thermal transport in thin films. Novel strategies to study thermal anisotropy.
Núria Aliaga-Alcalde	Professor ICREA	C/ Til.lers, s/n, CAMPUS UAB 08193 Bellaterra, Catalonia, Spain	naliaga@icmab.es	Materials Science UAB	ICMAB-CSIC / FunNanoSurf GROUP / http://departments.icmab.es/funnanosurf/	Nanoribbons in Molecular Electronics and Spintronics	The research project involve the synthesis of nanoribbons based on CCMoids that will be deposited on Graphene/SiO2/Si three-terminal devices to analyze the I-V characteristics of such materials. The project is divided in a chemical part where the organic materials will be synthesized and well-characterized and a second that includes the deposition of the materials and electronic measurements. Both parts made with the utilities of the group.
Maria Isabel Alonso	Research Scientist CSIC	ICMAB-CSIC, Campus UAB	isabel@icmab.es	Materials Science	Group of Nanostructured Optoelectronic Materials (ICMAB-CSIC)	Materials for energy	Optical properties of nanostructured and patterned materials using soft lithography and colloidal assembly for applications in light trapping, light emission, and sensing.
Dra. Elena Bartolomé Porcar	Full professor at EUSS (Escola Universitària Salesiana de Sarrià), School of Engineering associated to UAB; Head of EUSS Research Group; Doctor associated to ICMAB-CSIC	EUSS (UAB), Passeig Sant Joan Bosco, 74, 08017-Barcelona, Spain	ebartolome@euss.es	Material Sciences	Escola Universitària Salesiana de Sarrià (UAB), Magnetic Multifunctional Materials Group	"Magnetic 3d and 4f carborane based coordination polymers and MOFs: towards the development of new Multifunctional Molecular Materials"	The objective of this Thesis will be to synthesize new coordination polymers and porous metal-organic frameworks (MOFs) based on unprecedent carborane-based building blocks and suitable lanthanide (4f) or transition metal (3d) ions, and to investigate the magnetic properties in correlation with the structure of the materials. In particular, we plan to investigate the occurrence of Single-Molecular Magnet (SMM) behavior in materials of various dimensionality (1D, 2D, 3D) and magnetic ordering. In addition, we shall pursue the incorporation of a second physical property (e.g. luminescence, magnetocaloric effect), in views of the development of Multifunctional Molecular Materials for various applications, such as e.g. optoelectronics, anticounterfeiting or magnetic refrigeration. The PhD will be involved with the chemical synthesis and full physical characterization of the material, using a combination of techniques, including structural (XRD), magnetic (ac, dc magnetometry, XMCD in synchrotron), optical (luminescence, quantum yield), thermal (heat capacity) etc.

Ignasi Fina	Ramon y Cajal	Institut de Ciència de Materials de Barcelona (ICMAB-CSIC) Carrer dels Til·lers sn. Campus UAB Bellaterra 08193; Catalonia; Spain	ifina@icmab.es	Materials Science	Insitut de Ciència de Materials de Barcelona	Towards full-oxide electronic memory devices	There is an increasing demand of devices able to be integrated in the new era of devices in the age of the Internet of Things. These have further requirements of reliability and robustness and its downsize scalability might not be a main bottleneck anymore. The recent discovery of fully scalable ferroelectric oxide materials (doped hafnium oxide, HfO2) makes this material ideal candidate to be implemented in full oxide electronic devices. Ferroelectric materials show switchable by electric field spontaneous surface charge. This switchable charge can be used to modulate the conductivity of a so-called channel in a field effect transistor architecture device or of the tunneling current in ferroelectric tunnel junctions. ICMAB has the capability to growth such ferroelectric material (HfO2) with state-of-the-art crystalline quality. Thus, the framework of the present project is the development of full oxide devices based on highest quality ferroelectric oxide materials. For this work the student will work on the development of high quality films involving extensive structural (high resolution x-ray diffraction, synchrotron techniques,), but most importantly electric characterization (resistance measurements, ferroelectric characterization, device reliability parameters such as retention and fatigue, etc.). Electric characterization dynamics at the nanoscale will be also important to understand the physical mechanisms involved. In this regard atomic force microscopy integrating resistance measurements and ferroelectric characterization will be also a fundamental tool. Optical lithography at clean room facilities will be a final necessary step for device fabrication. The PhD will integrate a group with students and researchers with diverse expertieses and aims. The project will also be integrates in in-going collaborations with MIT (USA), University of Cambridge (UK) among other reseachers. The thesis will be supervised by Ignasi Fina (shorturl.at/gqHM5) with an intensive production and several on-going projects regarding the tôpic during the last years.
Martí Gich	Lecturer at the Advanced Nanoscience an Nanotechnology Master studies	C/Til·lers, Campus UAB	mgich@icmab.es	Materials Science	Institute of Materials Science of Barcelona (ICMAB-CSIC)	Functional materials for the upcoming generations of wireless communications	To cope with the ever-increasing demand of wireless communications, the new generations of mobiles will work at significantly higher frequencies, in the range of the so-called millimetre-waves. Those shorter wavelengths bring about shorter range eye-of-sight transmissions which will require deploying a myriad of anternnas and devices. New functional materials supporting low-cost energy efficient mm-wave devices will be needed to back such a paradigm shift. In particular, ferrites with large magnetic anisotropies which are being developed at ICMAB show promise as functional materials for designing self-biased non-reciprocal devices for the 5G technologies. The aim of the PhD is designing and testing passive, miniaturized non-reciprocal devices taking advantage of these new magnetic oxides.
Marta Mas-Torrent	Investigador CSIC	Campus UAB, 08193 Bellaterra	mmas@icmab.es	Materials Science	ICMAB-CSIC	Organic electronic devices: organic field-effect transistors for sensing	Organic electronic devices are raising a great deal of interest for low-cost and large area applications. Here, we plan to prepare organic semiconductor thin films using solution-based techniques in order to fabricate organic field-effect transistors. The devices will be optimised and implemented in sensing applications. The candidates should have a physics, chemistry or materials background.
Agustín Mihi	Tenured Scientist at ICMAB	Institute of Materials Science of Barcelona ICMAB-CSIC, Campus UAB 08193, Barcelona	amihi@icmab.es	Materials Science	Institute of Materials Science of Barcelona ICMAB- CSIC	Plasmonics, Colloidal chemistry, photonics	Assembly of metal and dielectric colloids into photonic and plasmonic crystals for sensing, light emission and light trapping. See more about us here: https://enlightment.icmab.es/
Florencio Sánchez	CSIC Research scientist	Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, Bellaterra 08193, Barcelona, Spain	fsanchez@icmab.es	Materials Science	Institut of Materials Science of Barcelona (ICMAB-CSIC)	Ferroelectric HfO2 thin films for memory devices	The thesis will focus on ferroelectric doped HfO2 and related compounds. These new oxides are prime candidates for a next generation of non-volatile ferroelectric memories. The thesis will develop epitaxial films to understand and improve ferroelectric properties. The films will be grown by pulsed laser deposition, on perovskite oxide substrates and Si(001), and the thesis will involve an exhaustive structural and functional characterization of the ferroelectric HfO2 films. The specific objectives include i) the use of doping atoms never used in epitaxial HfO2 films, such as Ga and Sr; ii) use of HfO2 films with a tailored amount of defects and with varied orientation to improve memory reliability; iii) development of nanolaminates and superlattices to enhance ferroelectricity in thick films and improve endurance; and iv) development of flexible epitaxial films. The results derived of the thesis are expected to be published in more than 10 scientific papers in high-impact journals. The PhD student will join the Materials Science Institute of Barcelona (ICMAB-CSIC), www.icmab.es. The thesis will be supervised by Dr. F. Sanchez. Google scholar: https://scholar.google.es/citations?hl=es&user=DSHxiTkAAAAJ&view_op=list_works&sortby=pubdate
Alejandro Rodolfo GOÑI	ICREA Research Prof.	ICMAB	goni@icmab.es	Materials Science	Group of Nanostructured Optoelectronic Materials (ICMAB-CSIC)	Materials for energy	Study of light emitting semiconductor nanostructures based on low-dimensional hybrid perovskites
Núria Crivillers	Científic Titular CSIC	Campus UAB, 08193 Bellaterra	ncrivillers@icmab.es	Materials Science	ICMAB	Novel organic materials for memories and energy storage	Electroactive organic materials show great potential for the fabrication of energy storage devices as well as memories. For this purpose we plan to design, prepare and characterise a wide range of organic and hybrid materials (i.e., covalent organic frameworks (COF), self-assembled monolayers, etc) based on electroactive building blocks. Organic radicals (OR) have awakened much interest for its wide applicability such as magnetic materials, imaging agents, catalyst, electrochemical active materials, among others. For this, OR will be investigated for the purpose of the project.
Methodology of Biomedical Research and Public Health							
Mª José Martínez Zapata	Senior Clinical Researcher Miguel Servet II	Sabt Antoni Mª Claret, 167, Pavillion 18	mmartinezz@santpau.cat	Methodology of biomedical research and public health	Public Health and Clinical Epidemiology Department	Safety of surgical patient	The candidate can be a graduate in life sciences (dentistry, nursing, medicine, pharmacy, psychology), interested in independent clinical research from both primary and secondary studies. The research project would be developed in perioperative medicine. The job position is a Doctoral fellowship in METHODOLOGY OF BIOMEDICAL RESEARCH AND PUBLIC HEALTH at the Autonomous University of Barcelona, Spain. The training program proposed to the candidate pursues the following objectives: A. Training in critical reading of primary research studies and systematic reviews; B. Training in conducting systematic reviews according to the Cochrane methodology; C. Training in the evaluation of the quality of the evidence following the GRADE methodology; D. Training in the design of clinical studies; E. Training in the execution and implementation of clinical studies The products of the doctoral fellowship will be related to Systematic reviews following the Cochrane methodology (or other synthesis products) and primary clinical studies centered in perioperative medicine.
Pablo Alonso Coello	Senior researcher	Sant Antoni Mª Claret, 167, Pavillion 18	palonso@santpau.cat	Methodology of biomedical research and	Methodology of biomedical research and public health	Clinical guidelines and decision making	Incorporation of values and preferences in guidelines and decision making
Pablo Alonso Coello	Senior researcher	Sant Antoni Mª Claret, 167, Pavillion 18	palonso@santpau.cat	Methodology of biomedical research and public health	Methodology of biomedical research and public health	Clinical guidelines and decision making	Incorporation of economic evidence in guidelines and decision making
Neuroscience							
Anna Rosell Novel	Senior Researcher, PhD	Passeig Vall d'Hebron 119-129, 08035, Barcelona, Spain	anna.rosell@vhir.org	Neurosciences	Neurovascular Research Laboratory / Vall d'Hebron Research Institute www.lin-bcn.com	Neurorepair in Stroke Disease	The PhD position is offered for a highly-motivated neuroscientist who will be trained in the research fields of neuroscience, stroke disease, tissue regeneration, pre-clinical models and nanomedicine. It is mandatory to enroll to a Neuroscience Doctorate Programme, have or obtain the accreditation for animal experimentation, and have fluid English both written and spoken. The candidate will develop her/his research skills working in stroke disease, affecting annually >15,000,000 people worldwide with a high burden and an economic impact. Despite this umbers only acute therapies are available in a short period of time (hours) after symptoms onset) and there is an urgent need to investigate for new treatments to minimize stroke damage but also to boost post-stroke neurorepair. The predoctoral researcher will be trained in developing cerebral ischemia in rodents, in vivo imaging techniques (such as MRI or Fluorescent Molecular Imaging), in designing pre-clinical studies for drug delivery and in investigating the molecular and cellular actions of the tested treatments aiming at improving stroke outcome. The aim of the project will be to improve neurovascular repair after stroke by testing Endothelial Progenitor Cells-based therapies with the help of nanomedicine products and other advanced advanced delivery approached. This is a long-term line of research at Dr. Rosell's Lab which has produced successful results, collaborations and trained several PhD students in the recent years, including CSC students. Please see https://pubmed.ncbi.nlm.nih.gov/?term=Rosell+A+AND+STROKE.

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
Mar Hernández Guillamon	Senior Researcher	Neurovascular Research Lab. Lab 106, Mediterranean Building. Passeig Vall d'Hebron 119-129, Barcelona 08035, Spain	mar.hernandez.guillamon@vhir.org	Neuroscience	Vall d'Hebron Research Institute	One of the general aims at the Neurovascular Research Lab (VHIR) is to explore the vascular contribution to β-amyloid (Aβ) brain deposition to provide new biomarkers, innovative drug targets and diagnostic approaches for Aβ-associated diseases, including AD and cerebral amyloid angiopathy (CAA), which refers to the Aβ deposition in brain vessels being a common cause of hemorrhagic stroke. The shared role of Aβ in CAA and AD is a clear example of the crosstalk between neurodegenerative and cerebrovascular processes. The overlap between both conditions is based on mutual Aβ generation and clearance pathways, although the brain injury in both cases induces different diseases. More info about the group can be found at: http://www.lin-bcn.com/amyloid/ Some of the most recent publications of our group related with the project are: • Marazuela et al. Acta Neuropathol Commun 2021. PMID: 34530925 • Camacho et al. Brain Pathol 2021. PMID: 34514662 • Giménez-Llort et al. Biomedicines 2021. PMID: 34199476 • Bonaterra-Pastra et al. Biomedicines 2021. PMID: 33445800 • Greenberg et al. Nat Rev Neurol 2020. PMID: 31827267	Project Title: Crosstalk between neurodegenerative and cerebrovascular processes in Alzheimer's disease Our project is based on the identification of factors specifically associated with Aβ-parenchymal plaques and/or cerebrovascular Aβ deposits. Unraveling the levels and functional involvement of these components will allow elucidating the mechanisms that determine Aβ distribution and trafficking within the brain and proposing therapeutic targets to prevent the brain injury induced by Aβ in CAA or AD. Our group at the Neurovascular Research Lab (VHIR) studies the link between neurodegeneration and neurovascular dysfunction through in vivo and in vitro methodologies, including the use of transgenic AD mouse models, brain organotypic cultures, BBB complex cell culture models, as well as human brain and plasma/CSF samples.
Physics							
Angel Lizana Tutusaus	Associated Professor. Optics	Universitat Autònoma de Barcelona. Department of Physics. Group of Optics. 08193 Bellaterra (Barcelona) Spain	angel.lizana@uab.es	Physics	Physics	Optics & Photonics	Development of polarimetric a camera and polarimetric diffractive elements based on structured liquid crystal devices. Implementation of a Stokes polarimeter to be applied in biophotonics applications. The student will implement different structured patterns (micrometric scale) that will be combined with a camera to design a snapshot full Stokes imaging polarimeter. This polarimeter will be tested and applied in biomedical applications, for the early recognition of some diseases.
Juan Campos Coloma	Full professor. Optics	Universitat Autònoma de Barcelona. Department of Physics. Group of Optics. 08193 Bellaterra (Barcelona) Spain	juan.campos@uab.es	Physics	Physics	Optics & Photonics	Development of experimental methods and computer algorithms to measure the mirrors used in a synchrotron with sub-nanometer accuracy. This is a collaboration between the University Autonomous of Barcelona (UAB) and the Synchrotron ALBA, with the goal of developing cutting edge numerical and experimental methods for mirrors metrology. These mirrors are key elements for the efficient performance of the synchrotron beam lines.
Aitor Mugarza	Research Professor at ICN2	Edifici ICN2 UAB Campus, Bellaterra (Barcelona) 08193, Spain	aitor.mugarza@icn2.cat	Physics	Institut Català de Nanociència i Nanotecnologia (ICN2)	Atomically precise graphene nanoarchitectonics for sensing and optoelectronics	The last decade has witnessed impressive advances in the bottom-up synthesis of graphene-based nanostructures. The case of 1D graphene nanoribbons is an illustrative one, where all structural parameters (width, edge structure, doping, functionalization) can be controlled with atomic precision. Our group has recently extended this atomic control to 2D with the demonstration of the synthesis of a nanoporous graphene (Moreno et al. Science 360, 199, 2018). The nanomaterial, selected as "molecule of the year" by the American Chemical Society, and the demonstration of field-effect transistor made by this semiconducting graphene, was highlighted in the main scientific journals (Science Perspectives, Nature Electronics, Chemical Engineering & News, IEEE Spectrum, Nano Today). In this PhD project we intend to bring this approach to the next level, by fusing GNRs with other active components (quantum, chemical…) in lateral heterostructures that can also be conceived as hybrid nanoporous graphene. The project will tackle the on-surface synthesis of the hybrid nanoarchitectures, the characterization of the atomic and electronic structures by low-temperature scanning tunnelling microscopy and spectroscopy (STM/STS), and the realization and characterization of gate-modulated devices.
Jose Ramon Duran	Senior Postdoctoral Researcher at ICN2	Edifici ICN2 UAB Campus, Bellaterra (Barcelona) 08193, Spain	joseramon.duran@icn2.cat	Physics	Institut Català de Nanociència i Nanotecnologia (ICN2)	Optoelectronic nanodevices with atomically precise graphene nanostructures	The project aims at the realization of optoelectronic devices based on graphene nanostructures that are synthesized with atomic precision. The one nanometer scale nanostructuring that our group is able to perform with atomic precision brings graphene plasmonics to the NIR regime of interest for telecommunication. Excitons are also predicted to lie at the same energy regime due to the strong excitonic binding energy in low dimensional structures. Interestingly, both can be effectively modulated by gating. The main objective of the project will be the detection of plasmons and excitons in different type of nanodevice geometries and the demonstration of their gate modulation. The student will first learn how to synthesize the graphene nanostructures following the on-surface method developed in the group (Moreno et al. Science, 360 199 (2018)), which will be characterized by scanning tunneling microscopy. Then graphene nanostructures will be transfered the onto insulating substrates where the nanodevices will be fabricated. The integrity and performance of the devices will be characterized by Raman, FTIR, and electronic transport measurements.
Pablo Merino	Research Professor at ICN2	Edifici ICN2 UAB Campus, Bellaterra (Barcelona) 08193, Spain	aitor.mugarza@icn2.cat	Physics	Institut Català de Nanociència i Nanotecnologia (ICN2)	Light-emission with subnanometer resolution from hybrid graphene nanostructures studied by scanning tunneling luminiscnece	Scanning tunneling luminiscence (STL) has proven to be a tool capable of studying light emission from single molecules, resolving the electroluminiscence yield with intramolecular resolution. It also allows to combine the optical study with electronic (STS) and vibrational (IETS) spectroscopy performed simoultaneously and with the same spatial resolution. This project aims at applying this technique to the study of novel optical phenomena emerging from hybrid graphene-based nanoarchitectures that contain excitons coupled in excitonic superlattices, arrays of single-photon emmiters and other interesting quantum photonic architectures. The synthesis will be based on a method recently developed in our gorup ((Moreno et al. Science, 360 199 (2018)), and the structures will be studied by combining STM/STS/IETS/STL in ultra-high vaccuum and cryogenic conditions. The promising nanoarchitectures will be transferred lonto insulating substrates to fabricate optoelectronic devices in order to test their potential applications.
Gervasi Herranz Casabona	CSIC Research Scientist at ICMAB	Institute for Materials Science of Barcelona ICMAB-CSIC, Campus UAB, Bellaterra, E-08193	gherranz@icmab.cat	Physics	Multifunctional Oxides and Complex Structures at ICMAB-CSIC	Spintronics and Quantum Transport	SPINTRONIC DEVICES BASED ON OXIDE QUANTUM WELLS. The student will study spin-charge conversion efficiency in 2D-Oxide interfaces, with the aim of investigating the efficiency of spin-orbit coupling to inject spin-polarized currents in quantum well devices. The candidate will develop device nanofabication (optical and e-beam lithography) and quantum transport characterization. For more information about the acttivities at the host lab, visit https://gervasi-herranz.blog/
Gervasi Herranz Casabona	CSIC Research Scientist at ICMAB	Institute for Materials Science of Barcelona ICMAB-CSIC, Campus UAB, Bellaterra, E-08193	gherranz@icmab.cat	Physics	Multifunctional Oxides and Complex Structures at ICMAB-CSIC	Spin-photon coupling in quantum systems	SPIN-PHOTON COUPLING IN QUANTUM SYSTEMS. The student will study the coupling between spin, photons and lattice in transition metal systems, with sizeable spin-orbit coupling. The objetive of the research is to use photons to entangle spin and orbital states for possible applications in quantum information. The candidate will develop thin film growth, device nanofabication (optical and e-beam lithography), optical spectroscopy and imaging and theoretical modeling. For more information about the acttivities at the host lab, visit https://gervasi-herranz.blog/

Riccardo Rurali	Científic Titular del CSIC	ICMAB-CSIC, Campus de Bellaterra	rrurali@icmab.es	Física	Theory and Simulation of Materials, ICMAB-CSIC	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 block 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.
Can Onur Avci	PhD Thesis Director at UAB / Principal Investigator at ICMAB-CSIC	ICMAB-CSIC, Campus de la UAB, Carrer dels Til·lers, s/n, 08193 Bellaterra, Barcelona	cavci@icmab.es	Physics	Physics / Science Faculty	Spintronics	Spintronics is the broad area of physics aiming to study the spin degree of freedom of charge carriers in solids and exploit it in future information technologies. It offers revolutionary solutions to memory and logic applications that can boost the efficiency and functionality of future computers. One of the outstanding challenges in spintronics consists in controlling magnetic binary data with electricity. Recently, current-induced spin-orbit torques (SOTs) have emerged as an efficient means to control the magnetization in prototype memory devices made of magnetic thin films [1]. SOTs are a result of charge-to-spin conversion in (generally) nonmagnetic materials due to the spin-orbit coupling. Recent reports suggest that oxidation of certain normal metals (e.g., Pt, Cu) increases the spin-orbit coupling and hence the SOTs [2]. This project aims to dynamically modify SOTs in normal metal/magnetic insulator hybrid structures using solid-state ionic gating [2]. Ionic gating can implement and move a broad range of ions, including O2-, in metals controllably and reversibly, hence opening a gateway for tuning the SOTs in a given host metal. Starting from these base ideas, the PhD student will: 1) design and fabricate multilayers where different host metals and gating ions can be tested; 2) characterize SOTs in these layers and screen the best metal/ion combinations; 3) fabricate functional spintronic devices for switching and domain wall motion experiments [3]; 4) study other emergent spin transport properties that ionic gating can modify. The bulk of the film deposition and device characterizations will be performed in the recently established state-of-the-art laboratories of the PI and other technical facilities at ICMAB. This project is expected to generate breakthrough knowledge on the dynamic control of SOTs, a less-explored but promising area of spintronics. Ultimately, the findings shall lead to functional spintronic memory devices whose effficiency can be greatly tuned by ionic gating at will. References: [1] Nature 476,189 (2011); Nat. Nano. 8, 587 (2013); Nat. Mater. 16, 309 (2017) [2] PRB 98, 014401 (2018); PRL 125, 177201 (2020) [3] Nat. Mater. 18, 35 (2019) [4] Nat. Nano. 14, 561 (2019).
Plant Biology and Biotechnology							
Julia Qüesta	Researcher at CRAG (Centre de Recerca en Agrigenòmica)	Edifici CRAG. Campus de la UAB. 08193 Bellaterra (Cerdanyola del Vallès) – Barcelona	julia.questa@cragenomica.es	PhD in Plant Biology and Biotechnology	Plant Development and Signal Transduction Program/CRAG	Epigenetcis and Plant Development	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, proteomics and bioimaging, this project aims at revealing previously unpredicted functions of lncRNAs in facilitating early seedling development.
L. María Lois	CSIC Scientist at CRAG (Centre de	Edifici CRAG. Campus de la UAB. 08193 Bellaterra (Cerdanyola del	maria.lois@cragenomica.es	PhD in Plant Biology and Biotechnology	Plant Development and Signal Transduction Program/CRAG	Study of the regulation of protein activity by the conjugation of SUMO and its implications in biotechnology.	The group's research is aimed at finding solutions to the challenges facing society related to food security by exploiting the role of protein regulation through SUMO conjugation or SUMOylation.
Soraya Pelaz	ICREA Research Professor at CRAG (Centre de Recerca en Agrigenòmica)	Edifici CRAG. Campus de la UAB. 08193 Bellaterra (Cerdanyola del Vallès) – Barcelona	soraya.pelaz@cragenomica.es	PhD in Plant Biology and Biotechnology	Plant Development and Signal Transduction Program/CRAG	Floral induction and development	Plants as sessile organisms have to maximize their chances to survive adversities by reprogramming their development for adaptation to environmental changes. The correct timing of flowering, which is crucial to ensure reproductive success, is therefore of economic and adaptive value. Genetic pathways that regulate flowering time have been extensively studied in model species Arabidopsis thaliana and, to a lesser extent, Oryza sativa. We have uncovered a crucial role of TEMPRANILLO genes as repressors of flowering in Arabidopsis that act as integrators of the floral induction genetic pathways. Moreover, the play critical roles in response to high salt and drought as mutants are insensitive to these stresses. We plan to extend this knowledge to rice and plan to generate CRISPR mutants of the recently identified OsTEMPRANILLO gene that regulates floral induction. Thus, we will further study their insensitivity to different abiotic stresses and uncover the gene regulatory networks this gene is involved in.
Terrestrial Ecology							
Josep Peñuelas	Professor de Recerca del CSIC (Número de registre: 4042781035A5402) i	Edifici C, Universitat Autònoma de Barcelona 08193 Bellaterra	josep.penuelas@uab.cat	PhD in Terrestrial Ecology	CREAF, GLOBAL ECOLOGY UNIT CREAF-CSIC-UAB	Biogeochemistry and global change	Impacts of global anthropogenic changes on the reserves and flows of bioelements on ecosystems and humans