ANNEX II.1

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-149894OB-I00	Global change and diversity from the Cretaceous to the Palaeogene: a deep ocean view	PRE2024-UZ-01

Principal Investigator 1 of the project: Alegret Badiola, María Laia

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Scientific lines of the project in which the thesis would be framed.

- *The Mesozoic Marine Revolution*
- *Evolution of Cretaceous benthic foraminifera*
- *Indicators of biogeochemical cycles*
- *Palaeoenvironmental and palaeoceanographic reconstructions*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-146041OB-C21	Development of laser scanning techniques to improve surface functionalities in the induction of hydrogen production processes and in superconductivity.	PRE2024-UZ-02

Principal Investigator 1 of the project: Angurel Lambán, Luis Alberto

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Principal Investigator 2 of the project: Badía Majós, Antonio

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Scientific lines of the project in which the thesis would be framed.

LINE: Surface functionalisation of superconducting materials and magnetic-superconducting material hybrid structures by means of laser treatments.

ACTIVITIES ON THE LINE:

- Laser irradiation of thin films and bulks of superconducting materials.
- Laser irradiation of magnetic-superconducting hybrid materials.
- Electromagnetic characterisation of functionalised materials.
- Microstructural characterisation of functionalised materials.
- Conceptualisation and numerical simulation

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-149052OB-I00	Improvements in the development of advanced biofuels with integrated CO2 capture	PRE2024-UZ-03

Principal Investigator 1 of the project: Arauzo Pérez, Jesús María

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Project principal investigator 2: Sánchez Cebrián, José Luis

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Scientific lines of the project in which the thesis would be framed.

The future doctoral thesis will be framed within the following line of research of the Thermochemical Processes Group

A) **Production of bioproducts and biofuels from biomass and waste.**

Specifically, the thesis will be developed in the Doctoral Programme in Chemical and Environmental Engineering, the main topic being the development of the production process of advanced biofuels from the pyrolysis of lignocellulosic biomass by means of the HDO process.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-146091OB-I00	Combination of therapeutic nanoparticles to prevent antimicrobial resistance using concerted approaches based on bioorthogonal binding on bacterial walls	PRE2024-UZ-04

Principal investigator 1 of the project: Arruebo Gordo, Manuel

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Scientific lines of the project in which the thesis would be framed.

Synthesis and characterisation of antimicrobial materials
Bioorthogonal chemistry
Nanoparticle-based targeted delivery systems Bacterial
resistance to antimicrobials Molecular mechanisms
of resistance
Microbiological assays on planktonic bacteria, sessile bacteria and intracellular infection
models
Topical polymicrobial infections

ANNEX II.5

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148256NB-I00	Deformation map of the Neogene of Iberia based on magnetic factories and mesostructures.	PRE2024-UZ-05

Principal Investigator 1 of the project: Casas Sainz, Antonio María

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Principal Investigator 2 of the Project: Román Berdiel, María Teresa

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Scientific lines of the project in which the thesis would be framed.

- Magnetic susceptibility anisotropy
- Structural Geology
- Paleomagnetism
- Tectonics

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-146811NA-I00	Liquid crystal complex colloids: creating new functional materials for optics and sensors	PRE2024-UZ-06

Principal Investigator 1 of the project: Concellón Allueva, Alberto
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Scientific lines of the project in which the thesis would be framed.

Emulsions are ubiquitous in our daily lives (e.g. milk, paint, cosmetics), but they are also key components in medicines, food and high-performance materials. In particular, complex liquid crystal emulsions (CLCEs) are an emerging field of research due to their excellent stimuli-responsive properties, and have shown significant potential for the design of functional soft materials, with applications in tunable optics, sensors, controlled release and robotics.

The main objective of this project is to develop ECCLs and harness their extraordinary potential by creating innovative integrated devices. Our work will particularly focus on exploring two key applications of ECCLs: (1) inexpensive biosensors with high sensitivity and versatility, designed for pathogen detection without the need for complex specialised equipment, making them ideal for point-of-care applications and environmental monitoring; and (2) dynamically switchable photonic lenses and devices, whose properties can be controlled by stimuli such as light, electric or magnetic fields. This multifaceted approach aims to harness the properties of ECCLs in unprecedented ways, opening the way to new application concepts and integrated devices. This aligns with the thematic priorities of the 'Spanish Strategy for Science, Technology and Innovation 2021-2027', also contributing to some of the Sustainable Development Goals (SDGs).

The research environment at UNIZAR and INMA, the only Aragonese centre with the Severo Ochoa distinction of excellence, offers an interdisciplinary framework and access to advanced infrastructures that will boost both the scientific and personal development of the PhD student. In addition, the training will include specialised workshops and a plan for the development of transversal competences, both specific to the PhD Programme in Organic Chemistry and of a general nature. This comprehensive approach will enrich the research experience, preparing the PhD student to successfully face the challenges of the future.
challenges in the demanding and constantly evolving field of advanced materials.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-147373OB-I00	Physics-informed models of the world for the development of cognitive digital twins	PRE2024-UZ-07

Project Lead Researcher 1: Cueto Prendes, Elias

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Principal Investigator 2 of the project: Alfaro Ruiz, Iciar

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Scientific lines of the project in which the thesis would be framed.

- • Physics-informed machine learning,
- • Neural networks informed by physics and/or thermodynamics,
- • Graph neural networks, geometric deep machine learning,
- • Digital human twins.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-147581NB-I00	From the Ebro to the Rubicon. The written culture of Hispania Citerior in the context of the northwestern Mediterranean (III B.C.E. - III A.D.)	PRE2024-UZ-08

Principal Investigator 1 of the project: Díaz Ariño, Borja

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Principal Investigator 2 of the project: Estará Tolosa, María José

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Scientific lines of the project in which the thesis would be framed.

Latin, Paleo-Hispanic and Paleo-European Epigraphy

Ancient History of the Western Mediterranean

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-151254OB-I00	Analysis of digital co-creative processes of heritage education integrating Artificial Intelligence.	PRE2024-UZ-09

Project Principal Investigator 1: García Ceballos, Silvia

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Principal Investigator 2 of the project: Rivero Gracia, María Pilar

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Scientific lines of the project in which the thesis would be framed.

The line in which the thesis is framed is focused on the field of formal education in secondary and higher education. It proposes to design and implement co-creative learning situations around heritage, through digital environments applied to the classroom and under a media literacy basis, in order to evaluate the learning generated and the skills developed in secondary school and teacher training students.

The contents to be worked on will be specific to the Social Sciences and a priority for socio-cultural progress, incorporating the bases of Media and Information Literacy in line with the MIL UNESCO Alliance: educating critical and creative thinking, or the ethical and democratic use of networks and information. The aim is for young people to be able to analyse, evaluate, create and access media content and media responsibly. This will be done through:

1) The design and implementation of co-creative actions applied in Secondary and Higher Education, designing and evaluating educational proposals through the use of digital media, based on the joint creation of contents, meanings or solutions to problems or challenges related to heritage.

2) The analysis of the relationships and learning that such practices can promote - and their scope - in heritage education based on cultural exchange and identifying the factors involved in such processes. (This will be done from the micro to the macro between local, national and international institutions).

3) The implementation of AI in the analyses will help us to ascertain the keys and study in depth the strategies, dynamics and interactions that occur co-creatively in educational actions.

4) Define to what extent co-creative actions favour and enrich heritage learning, what type of learning is produced and what AMI competences are developed with these proposals for the co-construction of knowledge in order to specify appropriate actions that are directly linked to the social needs of adaptation to digital media.

The proposed objectives are as follows:

- To explore in-service teachers' conceptions about the implementation of co-creative actions and their perception of media and information literacy (MIL) applied to formal education [diagnosis of difficulties], paying attention to different variables that may have an influence, especially gender.
- To foster co-creative and educommunicative learning through the implementation of co-constructive actions in heritage key in digital environments applied to formal education through the participation of several institutions and countries [design, implement and evaluate].
- To identify the educational achievements derived from the co-creative implementation from factors linked to the sustainability of heritage and media literacy.
- To compare the learning and narratives elaborated by students between the actions implemented in one centre and those implemented under the participation of several institutions and countries.
- Explore whether it is possible to train AI for learning analytics.
- To characterise the educational-communicative and co-creative keys based on the factors of commitment, participation and significant learning and their indicators - in AMI and heritage education - in order to extract the keys to educational action that enable the design and implementation of optimised actions and make a constant contribution to social progress.

It would be linked to the PhD programme in Education at the University of Zaragoza.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148739NB-I00	Controlling signalling profiles of GPCRs for use in the treatment of neuropathologies	PRE2024-UZ-10

Principal Investigator 1 of the project: García Nafría, Javier

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Scientific lines of the project in which the thesis would be framed.

The doctoral thesis in this research project would be devoted to the structural study of neuronal receptors using mainly electron cryo-microscopy.

At the technical level, in order to achieve the objectives, the following will be used:

- *Molecular cloning techniques,*
- *Protein production in eukaryotic systems,*
- *Protein purification,*
- *Biophysical characterisation of macromolecular complexes,*
- *as well as their structural determination by electron cryo-microscopy.*

The aim is to understand the functional mechanisms of neuronal receptors as well as the impact of certain modules on receptor structure and function.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148505OB-I00	Study of the mechanisms of heat resistance and latency of thermophilic spores that threaten the stability of sterilised products.	PRE2024-UZ-11

Principal Investigator 1 of the project: Gayán Ordás, Elisa

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Principal Investigator 2 of the project: Condón Usón, Santiago

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Scientific lines of the project in which the thesis would be framed.

Controlling bacterial spores that cause food spoilage is a major challenge in combating food waste and ensuring the supply of food of acceptable nutritional and sensory quality. Although heat is the most widely used preservation method to produce food that is stable at ambient temperatures, treatment conditions in industrial processes must be carefully optimised, and even then, spoilage still occurs, resulting in large economic losses. Spores of thermophilic species, both facultative and strict, are the main cause of spoilage of sterilised foods due to their high heat resistance. Furthermore, quantification of thermophilic spores in food is difficult due to the presence of a subpopulation that is unable to revive under optimal culture conditions, but can germinate and multiply during food storage in an unpredictable, "zombie-like" manner. As the intensification of heat treatments would compromise food quality and process profitability, there is an urgent need to look for alternative methods to inactivate thermophilic spores, together with the development of better methods for their detection and quantification. This requires a thorough understanding of the mechanisms of heat resistance and the germination process at the cellular and molecular level of thermophilic spores. Since thermophilic species producing the most heat-resistant spores often show a large subpopulation of "zombie" spores, both characteristics could be mechanistically and/or evolutionarily related. The main objective of this project is to identify the physio-molecular mechanisms associated with heat resistance and "zombification" in thermophilic spores, according to the following work plan:

(i) To assess the correlation between heat resistance and germination efficiency in thermophilic spores.

(ii) To assess the co-evolvability of heat resistance and "zombification" by means of directed evolution tests.

(iii) Characterisation of germination, resistance and physico-chemical properties of the spores of the mutants and their ancestors, including the whole population and the spore fraction.

"zombies".

(iv) Identification and validation of the mechanisms of increased heat resistance and "zombification" in the most representative spore mutants using a multi-omics approach and genetic modification techniques.

Experimental work involves learning and implementing classical microbiology techniques, predictive microbiology, microscopy, genetic engineering and proteomics.

It will be proposed to carry out a stay of at least 3 months in a foreign research centre.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-150327NB-I00	Towards Good Governance in Public Procurement in the Context of the European Health Union	PRE2024-UZ-12

Principal Investigator 1 of the project: Gimeno Feliú, José María

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Scientific lines of the project in which the thesis would be framed.

- *Public procurement, in particular strategic public procurement and its practical implementation.*
- *Administrative law, in particular good administration.*
- *Health law, in particular improving the management of health benefits, procurement of medicines, value-based care and putting the patient at the centre.*
- *Innovation, understood as a tool for achieving the results outlined above.*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-147987OB-C31	Development of in silico models for the analysis of tendinomuscular injuries using artificial intelligence based techniques.	PRE2024-UZ-13

Principal Investigator 1 of the project: Grasa Orús, Jorge

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Principal Investigator 2 of the project: Calvo Calzada, María Begoña

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Scientific lines of the project in which the thesis would be framed.

1. *Design of scaffolds for tendon tissue regeneration. Mechanical characterisation of fabricated scaffolds and after tenocyte culture.*
2. *Experimental characterisation of the active and passive behaviour of healthy tendon-muscle units after application of tendon damage and after regeneration treatments.*
3. *Development of multiphysics and multiscale models to predict muscle regeneration.*
4. *Numerical simulation of the active response of the tendon-muscle units of the ankle and shoulder joints of the animal model.*
5. *Development of reduced order models to reduce computational simulation times.*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148342OB-I00	Integrated photonics for sensing and communications integration	PRE2024-UZ-14

Principal Investigator 1 of the project: Izquierdo Nuñez, David Contact e-mail: davidizq@unizar.es   Principal Investigator 2 of the project: Subías Domingo, Jesús Mario Contact e-mail: chubi@unizar.es
Scientific lines of the project in which the thesis would be framed.
  - *Integrated photonics* - *Design and characterisation of new photonic integrated circuits and devices (PICs) with Indium Phosphide (InP) and Silicon Photonics (SiP) technologies.* - *Coherent optical communications in optical fibre* - *New advanced modulation formats and transceiver architectures* - *Distributed fibre optic sensors* - *New signalling formats and interrogator architectures*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148958OB-C21	Innovative strategies for smart and sustainable polygeneration systems: a focus on lifecycle analysis and predictive control modelling	PRE2024-UZ-15

Principal Investigator 1 of the project: Lázaro Fernández, Ana

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Principal Investigator 2 of the project: Guillén Lambea, Silvia

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Scientific lines of the project in which the thesis would be framed.
1. Smart, sustainable and economically feasible polygeneration systems 2. Incorporating artificial intelligence (AI) machine learning techniques into energy integration, predictive control and thermal energy storage 3. Life Cycle Assessment/Life Cycle Analysis (LCA) applied to energy optimisation in the synthesis and operation of polygeneration systems.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148949NB-I00	Deciphering the complex translatitudinal coupling between climate and palaeogeography during the Lower Cretaceous of the Iberian Plate	PRE2024-UZ-16

Principal Investigator 1 of the project: Liesa Carrera, Carlos Luis
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Principal Investigator 2 of the project: Soria de Miguel, Ana Rosa
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Scientific lines of the project in which the thesis would be framed.

1) Sedimentology and palaeoclimate in continental-transitional environments of the Lower Cretaceous.
2) Cyclostratigraphic analysis;
3) Tectono-stratigraphic analysis and synsedimentary deformation in extensional contexts
4) Palaeogeographic analysis and palaeoclimatic variability in a translatitudinal context.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-150074NB-I00	Computational tools for haemodynamic characterisation in laparoscopic abdominal surgery	PRE2024-UZ-17

Principal Investigator 1 of the project: Murillo Castarlenas, Javier Antonio

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Scientific lines of the project in which the thesis would be framed.
Computational haemodynamics   *Numerical methods in flow simulation in arteries and veins Fluid-structure interaction in transonic regimes Calibration of haemodynamic parameters*   *Transient pulse signals in closed-loop haemodynamic models Mathematical modelling of orthostatic stress and pneumoperitoneum.*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-151473OB-I00	Cost-effectiveness and acceptability study of the Unified Protocol for the treatment of emotional disorders in brief groups in primary care services in Spain.	PRE2024-UZ-18

Principal Investigator 1 of the project: Osma López, Jorge Javier

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Scientific lines of the project in which the thesis would be framed.

Line 3. Efficiency and cost-effectiveness of transdiagnostic psychological interventions in emotional disorders.
General objectives: [1] To analyse the efficacy, cost-effectiveness and acceptability of the Unified Protocol for the transdiagnostic treatment of emotional disorders in group format in 5 vs. 8 sessions in Primary Care services in Spain; [2] To explore the variables that are related to greater or lesser improvement after the intervention and to offer evidence-based recommendations on the optimal duration of psychological treatments for adults with ET seen in PC.
Specific objectives:
Phase 1: [O1] Adapt the PU for group application in 5 and 8 sessions in PC users with ET. [O2] Carry out a pilot study to analyse the clinical usefulness and acceptability of the two interventions in PC (PU in 5 vs. 8 sessions) by the participants. [O3] To explore the degree of feasibility and acceptability of the two interventions in PC (PU in 5 vs. 8 sessions) by the professionals in charge of applying them.
Phase 2: [O4] Conduct a multicentre randomised clinical trial (RCT) to analyse the efficacy, cost-effectiveness of the two interventions in PC (PU in 5 vs 8 sessions). [O5] To explore the predictor or inter-relationship role (moderation, mediation, moderated mediation or mediated moderation) between participants' previous socio-demographic and clinical characteristics and their clinical improvement in the 5 and 8-session PU conditions. O6] To analyse the cost-effectiveness of both treatment conditions. [O7] To explore the acceptability and satisfaction of the two PA interventions (PU in 5 vs. 8 sessions), by the participants who have received it. [O8] To explore the feasibility and acceptability of the two interventions in PC (PU in 5 vs. 8 sessions), by the professionals who have received them.
who have implemented them.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-146072OB-I00	Tissue engineering platform for mechanical design, in vivo testing and in silico modelling of skin scaffolds for chronic wound treatment	PRE2024-UZ-19

Principal Investigator 1 of the project: Pérez Ansón, María de los Ángeles

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Principal Investigator 2 of the project: García Gareta, Elena

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Scientific lines of the project in which the thesis would be framed.

Tissue engineering with application to pressure wounds
Computational design of skin scaffolds Experimental and
computational characterisation of materials Fabrication of
skin scaffolds
Multi-scale, multi-physics simulation of wound healing

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148975OB-I00	Sex as a modulator of electrophysiological abnormalities leading to cardiovascular risk	PRE2024-UZ-20

Principal Investigator 1 of the project: Ramírez García, Julia

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Principal Investigator 2 of the project: Mincholé Lapuente, Ana

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Scientific lines of the project in which the thesis would be framed.

- **Line 1: Investigation of factors modulating the ECG waveform in men and women**.

  The aim is to assess the differences in the relationship between demographic, anatomical, functional, autonomic and hormonal factors and standard ECG measurements in subjects without cardiovascular disease. Subsequently, a statistically based parametric atlas will be developed to characterise the average 12-lead ECG waveform and its variability as a function of the above factors.

- **Line 2: Identification of sex differences in cardiovascular disease risk using the corrected ECG waveform.**

  This line aims to assess and quantify CVD risk from the ECG waveform using the atlas developed in line 1. Then, sex-specific proteomic and metabolomic associations with CVD risk markers from the ECG will be identified. Finally, computational models will be used to understand sex-specific electrophysiological mechanisms in coronary heart disease and their relationship to ventricular arrhythmia risk.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148568OB-I00	Landscape-scale fire assessment - Responding to extremes and urban sprawl in Spain	PRE2024-UZ-21

Principal Investigator 1 of the project: Rodrigues Mimbrero, Marcos

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Principal Investigator 2 of the project: Alcasena Urdiroz, Fermín (Universidad Pública de Navarra)

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Scientific lines of the project in which the thesis would be framed.

Spatio-temporal modelling of fire risk in changing scenarios: occurrence and socio-economic factors of ignition, spread and fuel patterns, ecological and social vulnerability, damage assessment/prediction.

Modelling of land cover dynamics: characterisation of the forest-urban interface, urban expansion processes, vegetation dynamics, projection of land cover changes.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-153228NB-I00	New vulnerabilities: trade-offs and imbalances in the private-legal order	PRE2024-UZ-22

Principal Investigator 1 of the project: Salas Murillo, Sofia del Pilar de   Contact e-mail: sofiasal@unizar.es   Principal Investigator 2 of the project: Mayor del Hoyo, María Victoria   Contact e-mail: mvmayor@unizar.es
Scientific lines of the project in which the thesis would be framed.
Study of the reconfiguration of law brought about by the digital society: protection of personality rights in vulnerable sectors.   The digital and technological era, in addition to posing ethical and legal problems, shows a series of vulnerabilities that are preventively solved by the system, as opposed to others that emerge, for example, in the context of *smart contracts*, *cloud computing* or the problems derived from electronic contracting. These vulnerabilities are exacerbated in the case of groups that are themselves vulnerable, giving rise to situations of hyper-vulnerability, such as the elderly, minors or people with disabilities.   The thesis would be framed within the study of the vulnerabilities provoked or solved in these particularly vulnerable sectors: in particular, the vulnerability to which minors are exposed, either as a result of their parents' *sharenting* or when they act as *kidsinfluencers*, insofar as it directly affects the exercise of their personality rights.   The emergence and rapid expansion of the use of AI in numerous computer programmes and applications in widespread use leads to an aggravation of the most classic vulnerabilities, from the point of view of private law: minors and people with mental disabilities. In relation to them, questions arise in relation to the formation of their will, so that they are able to issue a legally valid and effective consent, as well as with the (to date scarcely effective) mechanisms aimed at verifying both their inclusion or not in the vulnerable group and the intensity of the consent issued, and questions also arise in relation to possible violations of their personality rights, especially the right to privacy, on occasions by those legally responsible for watching over them (as occurs in the case of so-called *sharenting*).

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148732NB-I00	Catalytic exosomes as therapeutic agents. Anti-tumour and anti-bacterial applications.	PRE2024-UZ-23

Principal Investigator 1 of the project: Santamaría Ramiro, Jesús Marcos

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Principal Investigator 2 of the project: Sancho Albero, María

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Scientific lines of the project in which the thesis would be framed.

1) Selective catalytic therapy
Both artificial and natural catalysts are emerging as new therapeutic tools, capable of modifying conditions inside target cells. CONCERT will develop several types of catalysts with therapeutic activity.

2) Extracellular vesicles as delivery vectors for therapeutic catalysts
This project will use extracellular vesicles (EVs) as highly selective vectors to deliver therapeutic cargo to target cells. To this end, loading methods that preserve the recognition properties of the vesicles will be developed. Alternatively, artificial vesicles, made from cell membranes or EVs, will be developed.

3) Anti-tumour and anti-bacterial applications
The most suitable catalyst-loaded EVs will be selected for the treatment of cancer and intestinal infections in animal models.

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148215NB-I00	CRM Meets AI: Leveraging advanced technologies for a bigger and broader impact	PRE2024-UZ-24

Principal Investigator 1 of the project: Sesé Oliván, Francisco Javier

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Principal Investigator 2 of the project: Melero Polo, Iguacel

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Scientific lines of the project in which the thesis would be framed.

- *Study of the adaptation and improvement in the effectiveness of Customer Relationship Management (CRM) in the presence of new technologies and artificial intelligence.*
- *Artificial intelligence and its impact on the customer journey and consumer experiences*
- *Implications of the use of new technologies on individuals' decisions and their ultimate impact on social and consumer welfare measures.*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148401OB-I00	Energy assessment of circular economy, sufficiency and regeneration measures to reduce the resource consumption of the energy transition	PRE2024-UZ-25

Principal Investigator 1 of the project: Valero Delgado, Alicia Contact e-mail: aliciavd@unizar.es
Scientific lines of the project in which the thesis would be framed.
 - *Exergetic analysis. Assessment of the thermodynamic rarity of raw materials.* - *Thermo-economic analysis of raw material recovery processes.* - *Metallurgy associated with the recovery of raw materials from technological waste.* - *Simulation of mining-metallurgical and agronomic processes and impact assessment through Life Cycle Analysis.* - *Studies of agricultural soil regeneration processes.*

Project Reference	Project title	Reference pre-doctoral support for request
PID2023-148480OB-I00:	Inclusion of student and community voices for creative and sustainable education in a digital context. Policy and practice in compulsory education.	PRE2024-UZ-26

Principal Investigator 1 of the project: Vigo Arrazola, María Begoña

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Scientific lines of the project in which the thesis would be framed.

- Inclusive education policies and practices. Student and community voices. Compulsory education.
- Digital context.
- Ethnographic design.
- Educational and social transformation.
The general objective of the project is to analyse the role of student and community voices through educational policies and practices with digital media in socially and geographically disadvantaged schools in the communities of Aragón, Castilla y León, Extremadura and Madrid.