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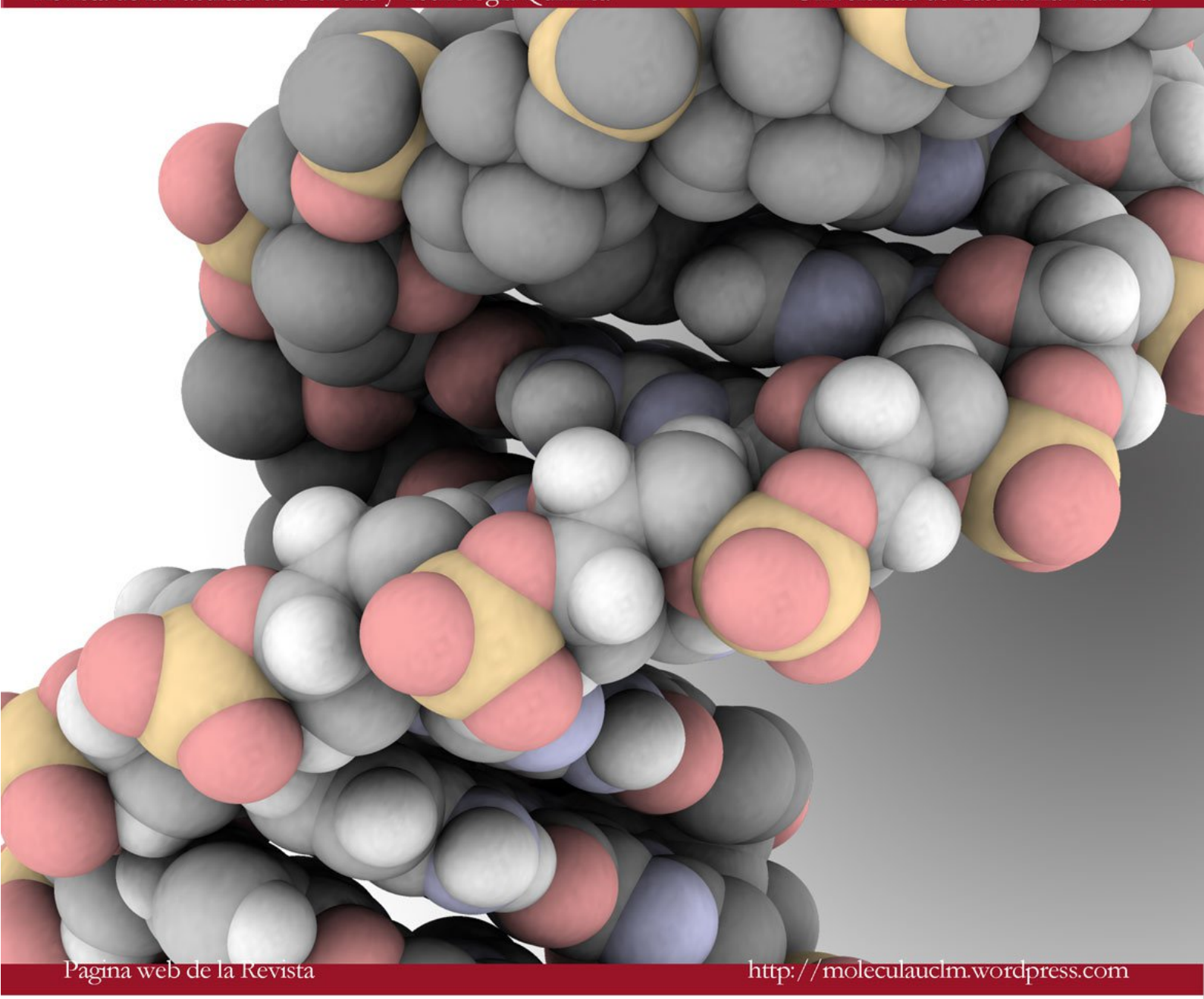

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PRESENTACIÓN

El mes de Julio esta dedicado al XV Young Science Symposium donde se recoge el transcurso de este interesante evento. Se muestran las conferencias de prestigiosos invitados, comunicaciones orales y comunicaciones flash, todo ello con el fin de conocer el increíble trabajo que se realiza.

Aparte de lo mencionado, se recogen los premios otorgados y experiencias vividas en el symposium.

¡Deseamos que lo disfrutéis!

El comité editorial.

PRESENTACIÓN XV YOUNG SCIENCE SYMPOSIUM

Los noveles investigadores de la UCLM comparten sus líneas de trabajo en el Simposio Ciencia Joven

Marian Herrero (i), Ana Briones (c) y Manuel Andrés Rodrigo.

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Organizado por la Facultad de Ciencias y Tecnologías Químicas, se celebra en formato híbrido desde el 7 de Julio 2021 y hasta el 9 de Julio 2021.

La Facultad de Ciencias y Tecnologías Químicas de la Universidad de Castilla-La Mancha (UCLM) en Ciudad Real celebra entre el 7 y el 9 de Julio el XV Simposio Ciencia Joven, durante el que los investigadores noveles presentan sus líneas de trabajo a sus colegas de la institución académica a fin de conocer qué están desarrollando. El encuentro, que cumple su decimoquinta edición, se celebra en forma híbrido y congrega a unos 170 investigadores.

Los jóvenes investigadores de la Facultad de Ciencias y Tecnologías Químicas en el Campus de Ciudad Real, así como de otros llegados de distintos centros de la Universidad de Castilla-La Mancha (UCLM), presentaron entre el miércoles 7 de Julio y el viernes 9 de Julio a la comunidad académica sus líneas y resultados de investigación con motivo de la celebración del XV Simposio Ciencia Joven, una iniciativa que en esta edición se celebró en formato híbrido (presencial y en línea) y que a su vez les supone una oportunidad para acercar a los estudiantes a la tarea investigadora.

El encuentro reunió a alrededor de 170 investigadores y en él tuvieron cabida 35 comunicaciones orales de noveles investigadores, además de seis charlas de ponentes externos invitados de la Durham University (UK), Newcastle Universtity (UK), Arizona State University (USA), Universitat Politécnica de Valencia, Institute of Food Science, Technology and Nutrition y Universidad de Valladolid. Asimismo, y por primera vez en estos años, los pósteres han sido sustituidos por flash virtuales de vídeos de unos tres minutos de duración que pueden verse en las redes sociales de la Facultad de Ciencias y Tecnologías Químicas.

PRESENTACIÓN XV YOUNG SCIENCE SYMPOSIUM

Las líneas de investigación a presentar son “muy variadas”, tal y como ha explicado la vicedecana de Estudiantes de la Facultad de Ciencias y Tecnologías Químicas y una de las organizadoras del evento, Marian Herrero, y pasan por las propias relacionadas con la Química, la Ingeniería Química y la Tecnología de Alimentos que pueden cursarse en el propio centro, a otras que tienen que ver con la sostenibilidad, la atmósfera o los hidrogeles. Ello da cuenta del carácter multidisciplinar que tiene este evento que en palabras de Herrero supondrá “una oportunidad para que los jóvenes investigadores interaccionen y conozcan qué hacen sus compañeros de Universidad, qué se investiga aquí”.

Precisamente, la vicerrectora de Profesorado, Ana Briones, encargada de inaugurar el simposio, ha insistido en la importancia que tiene conocer el trabajo de investigación que realizan otros y relacionarse con investigadores distintos a los de su centro y campus, porque “el conocimiento pertenece a la Humanidad”. Asimismo, ha señalado que eventos científicos y divulgativos como éste son “un buen escaparate” para que los jóvenes se entusiasmen por la Ciencia.

En su intervención, Briones ha indicado que la Ciencia “es conocimiento, saber” y que “es la investigación la que permite incrementar el conocimiento”. En este punto, ha recordado la apuesta continua de la UCLM por hacer una investigación de excelencia y ha apuntado a la Facultad de Ciencias y Tecnologías Químicas como “ejemplo de esfuerzo y formación en jóvenes doctores, que se extiende al resto de centros” de la institución académica.

Junto a la vicerrectora, el decano de la Facultad de Ciencias y Tecnologías Químicas, Manuel Rodrigo, ha hecho también alusión a la importancia de este simposio para “motivar e ilusionar a los jóvenes para que hagan carrera investigadora”, porque la ciencia “es atractiva, conlleva un esfuerzo y sacrificio, pero a la vez es gratificante”. “Hay que intentar concienciar a la sociedad de la importancia que tiene la Ciencia y de cómo nuestros investigadores, en especial los más jóvenes, pueden ayudar a mejorar nuestra calidad de vida”, ha manifestado.

El XV Simposio de Ciencia Joven incluye los premios a la Mejor Comunicación Oral, al Mejor Flash Virtual en las categorías de TFG, TFM y doctorado, y el Premio Social Media al vídeo con mayor impacto y viralización, patrocinados por Agrovin, Dilabo, la sección territorial de Castilla-La Mancha de la Real Sociedad Española de Química y Mervilab.

Gabinete Comunicación UCLM. Ciudad Real, 7 de julio de 2021

PRESENTACIÓN XV YOUNG SCIENCE SYMPOSIUM

Marian Herrero: "La participación y el nivel de los investigadores hacen del Congreso de Ciencia Joven un acontecimiento relevante para nuestra Facultad»

Simposio de Ciencia Joven

La vicedecana de Estudiantes de la Facultad de Ciencias y Tecnologías Químicas, Marian Herrero, defiende la relevancia adquirida por el XV Simposio de Ciencia Joven que se celebra en el campus de Ciudad Real, por el incremento de la participación y la presencia de relevantes investigadores. Herrero, como organizadora de este evento, destaca el hecho de contar con la participación de grupos de toda la UCLM, la participación con presentaciones flash/virtual y la ampliación del número de premios. Hasta el viernes 9 de Julio, los investigadores nóveles presentaron sus líneas de trabajo para dar a conocer los proyectos en los trabajan.

Marian Herrero, vicedecana de Estudiantes de la Facultad de Químicas del campus de Ciudad Real

La **vicedecana de Estudiantes** de la Facultad de Ciencias y Tecnologías Químicas, Marian Herrero, pone el valor la decimoquinta edición del Simposio de Ciencia Joven que ha sido inaugurada el miércoles 7 de Julio en el campus de Ciudad Real por el incremento de la participación, así como la presencia en el mismo de investigadores de relevancia lo que "lo hacen más multidisciplicar y adquiere otro carisma", señala en esta entrevista con este digital.

Líneas de investigación

La también presidenta de la Sección Territorial de Castilla-La Mancha de la Real Sociedad Española de la Química y una de las organizadoras de este encuentro participaba la mañana del 7 de Julio en la inauguración del congreso, junto al decano de la Facultad de Químicas, Manuel Rodrigo, y la vicerrectora de Profesorado, Ana Briones, donde ha señalado que las líneas de investigación que presentadas son variadas y pasan por las relacionadas con la Química, la Ingeniería Química y la Tecnología de Alimentos que se pueden cursar en el propio centro, a otras que tienen que ver con la sostenibilidad, la atmósfera o los hidrogeles.

La Facultad de Ciencias y Tecnologías Químicas de la Universidad de Castilla-La Mancha (UCLM) en Ciudad Real celebra la edición número 15 del Simposio Ciencia Joven, durante el que los investigadores noveles presentaron sus líneas de trabajo a sus colegas para que se conozca qué están desarrollando.

7 Julio 2021. Lanza Digital

PRESENTACIÓN XV YOUNG SCIENCE SYMPOSIUM

PREGUNTA ¿Qué evolución ha tenido el Congreso de Ciencia Joven a lo largo de estas XV ediciones?

RESPUESTA.- Ha sido un congreso que ha evolucionado mucho, se comenzó como unas charlas que empezamos organizando los estudiantes de doctorado para conocer la investigación que se llevaba a cabo en la Facultad de Ciencias y Tecnologías Químicas e intentar fomentar la colaboración entre los diferentes grupos (uno de los impulsores es Javier Guerra que será un conferenciante del viernes).

Primero se celebraba los viernes de mayo y junio con una charla por jornada. Posteriormente se empezó a concentrar mas las charlas, luego se pasó a celebrarse durante tres días seguidos y a invitar a investigadores relevantes de otros centros, incluso se empezaron a convocar premios para los doctorandos que daban estas charlas. Y actualmente hemos propuesto mas premios, hemos pasado a extender la participación a los diferentes centros de la UCLM en la rama de ciencias, con una modalidad mixta on line/presencial.

PREGUNTA- Este congreso comenzó para tener interacción entre los jóvenes y ha llegado a tener un importante nivel de relevancia. ¿Cuáles son las claves para llegar a ese nivel?

RESPUESTA- Pues porque hemos incrementando la participación y por tanto se ha convertido en un congreso relevante para nuestro centro y por consiguiente para los demás centros que han comenzado a participar, de igual forma la presencia de otros investigadores relevantes, lo hacen más multidisciplinar y adquiere mayor carisma.

De igual forma hemos contado con la presencia de diferentes autoridades, este año hemos contado en la inauguración con la presencia de la vicerrectora de profesorado, Ana Briones, y en la clausura estará el rector de la UCLM, Julián Garde y del director general de universidades, Ricardo Cuevas.

PREGUNTA- Esta edición, ¿qué novedades aporta?

RESPUESTA- Una de las novedades principales es haber podido contar con la participación de grupos de toda la UCLM y otras de las más destacadas es la incorporación de la participación con presentaciones flash/virtual y la ampliación del numero de premios a esta categoría con diferencia de si el participante es de TFM, TFG o doctorando y también una entrega de premios por likes en redes sociales, igualmente también vamos a realizar una porra con obsequios para los que acierten los ganadores.

Imagen de los asistentes a la inauguración del Simposio de Ciencia Joven en el campus de Ciudad Real/ J.Jurado

PRESENTACIÓN XV YOUNG SCIENCE SYMPOSIUM

PREGUNTA- El congreso está dirigido a estudiantes de la UCLM o ¿también participan de otras universidades?

RESPUESTA- Pueden participar de todos sitios, pero con comunicación solo de la Universidad de Castilla-La Mancha.

PREGUNTA- ¿Cuántos son los participantes?

RESPUESTA- Tenemos casi 100 ponencias entre las dos categorías hay alrededor de 170 inscritos.

PREGUNTA- ¿Qué temas se abordarán durante estas tres jornadas?

RESPUESTA- Los temas son temas muy diversos, tenemos comunicaciones desde los tres grados de la facultad y por tanto tenemos participantes desde matemáticas, física, diferentes áreas de la química, tecnología de alimentos, ingeniería química, agrónomos, farmacia, centros como el IREC, de muy diversa temática y eso lo va hacer un congreso realmente enriquecedor.

PREGUNTA- Intervienen ponentes tanto de la UCLM como de otras universidades

RESPUESTA- Intervienen ponentes de toda la UCLM en las orales y flash y luego tenemos 6 charlas invitadas que 3 de ellas son on line porque son de ponentes que están en el extranjero y también 3 presenciales que serán el próximo viernes y la presencia de los sponsors como Agrovin que ademas dará una pequeña charla o la Sección Territorial de Castilla-La Mancha de la Real Sociedad Española de la Química que también dará una pequeña charla.

En este encuentro tendrán cabida seis charlas de ponentes externos invitados de la Durham University (UK), Newcastle Universtity (UK), Arizona State University (USA), Universitat Politécnica de Valencia, Institute of Food Science, Technology and Nutrition y Universidad de Valladolid. También, y por primera vez en estos años, los pósteres han sido sustituidos por flash virtuales de vídeos de unos tres minutos de duración que pueden verse en las redes sociales de la Facultad de Ciencias y Tecnologías Químicas.

"Supramolecular Gels: Tangled Soft Materials"

Jonathan W. Steed

Gels are formed by hierarchical self-assembly either because of hydrophobic effects in water or by more directional interactions such as hydrogen bonding in less polar solvents (Fig. 1). Low molecular weight gelators based on small-molecules (LMWG) are emerging as pharmaceutical crystallization media. Particular attractions of LMWGs to the scientific community are the reversible nature of the interactions between the gelator molecules, the wide (essentially unlimited) range of solvents that can be gelled and the possibility of tuning the gels' behaviour by introducing responsive or switching functionality.

This presentation focuses on control and crystallization by manipulating the materials properties of small molecule (supramolecular) gels and the nature of the gel fibre surface. We show how concepts firmly rooted in supramolecular host-guest chemistry and supramolecular self-assembly can be married with the materials science of soft matter in order to control and manipulate bulk materials properties.[1] The application of these kinds of switchable gels as novel media for pharmaceutical crystal growth is emerging.

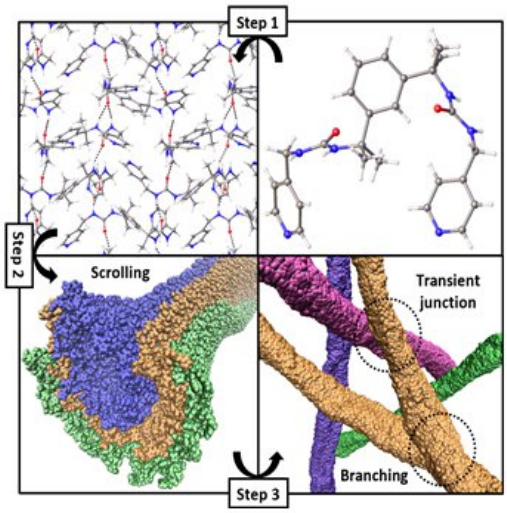

Figure 1. Assembly of a supramolecular gel by (1) layering, (2) scrolling and (3) entanglement.

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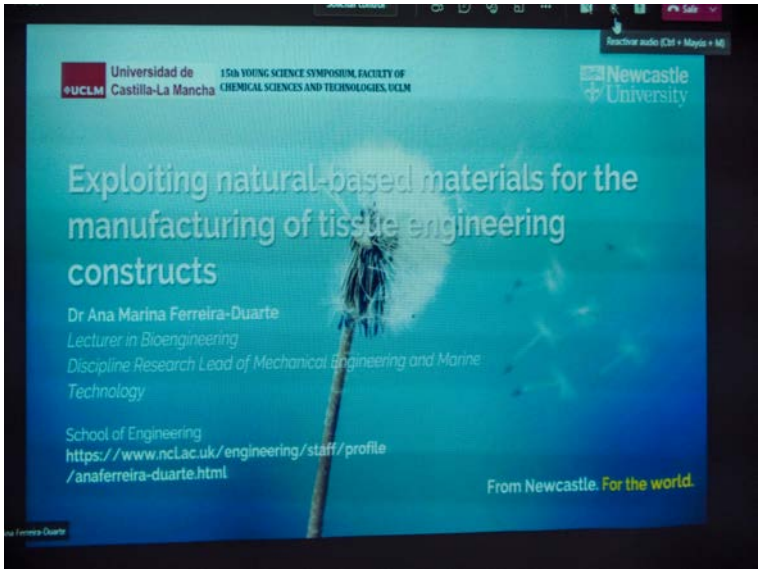
Exploiting natural-based materials for the manufacturing of tissue engineering constructs

Ana Marina Ferreira-Duarte



The extracellular matrix (ECM), the non-cellular portion of a tissue that regulates key bio-functions and cell fate, is damaged, altered, or lost in most human diseases and injuries. The use of biomaterials as tissue constructs is showing promise as a regenerative medicine approach to facilitate new tissue formation by recreating native micro-environments. Particularly, natural polymers are widely used to support or guide cellular function by mimicking the native ECM composition and microenvironment [1-2]. For example, naturally derived materials, such as animal-derived collagen and fibrin, already contain cell adhesion ligands and are susceptible to proteolytic degradation that enables cell infiltration and remodelling [3]. The use and processing of different natural-based materials as functional coatings and scaffolds are studied [2-5], including the exploitation of bio-fabrication technologies like bioprinting for creating bioinspired tissue engineering constructs. In recent works, the importance of bioink composition and cell density in the development of biomimetic and bioinspired tissue engineering constructs was investigated, as these directly impact cellular process and tissue maturation rates [6]. Therefore, the use and processing of different natural-based materials for the creation of biomimetic and tissue engineering constructs will be discussed.

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Applied electrochemical technologies to decentralized water treatment: Advances within materials, chemistry, and engineering nexus for small scale application

Sergi Garcia-Segura

Water scarcity and quality are critical issues on a global scale. Ensuring access to water and sanitation for all is a sustainable development goal identified by the United Nations. Emerging contaminants (e.g., perfluoroalkyl substances, pharmaceuticals, pesticides, etc.) are ineffectively removed by conventional water treatment technologies and may produce waste. Multidisciplinary research efforts are key to succeed in the development of promising transformative water treatment technologies. In this scenario, electrochemically-driven processes emerge as alternative new generation of advanced treatments.

General principles of electrochemical water treatment processes will be introduced as a base to discuss research efforts at different technology readiness levels. Specifically, niche market opportunities of scaled-down devices for point-of-use applications will be presented using three examples. This seminar aims to discuss key questions that drive the research needs of today and tomorrow. How can electrochemical processes and engineering can contribute to advance the next generation of smart and sustainable water treatment? Join us to discover some answers in this seminar.

Oportunidades en la carrera investigadora a través de los programas de la Agencia Estatal de Investigación

Miguel Ángel Miranda

Recorremos en esta charla la actualidad del camino académico en España desde el punto de vista del Presidente del área científica: Ciencias y Tecnologías Químicas (CTQ) de la Agencia Estatal de Investigación de España.

Building bridges between Academia and Industry. Which are the missing pieces?

Javier Guerra

The society requires different missions from the Higher education institutions. Beyond teaching duties and research, there is a third mission that is based on the production of knowledge that generates a social and economic development.[1] This interpretation of an entrepreneurial university finds two antagonist views. Universities claim that teaching involves not only knowledge but also values and transversal skills and they should not provide students with specific profiles adjusted to job vacancies. Entrepreneurs sustain that their companies require professionals with capabilities adapted to the job essential functions.

This talk is addressed to empower the doctorate studies as a critical piece to build a bridge between these two sides. Currently, some authors[2] demand for a mind-set revolution among doctoral students and their supervisors to make the students more sympathetic to employment outside academia. Competencies acquired during the PhD training should range from transdisciplinary to cooperative skills and attitudes, integrating knowledge to find solutions to real-life issues and personal skills such as communication, leadership, ability, resilience, change adaptability and creativity.

In the first part of the talk, we will take a glance at the current R&D scenario in Spain followed by a second part where the distinctive features that compose the research performed in the Chemical-Pharmaceutical Industry are studied. Different causes will be formulated to explain the lack of communication between Academia and Industry. The missing dots of a typical doctorate profile working in the private sector will be exemplified by the experience of the speaker in Academia as well as in the Industry.

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Novel nutraceuticals based on combination of oat beta- glucans and green coffee phenolic extract to combat obesity and its comorbidities

Mateos R*, Bravo L & Sarriá B

Obesity and its associated comorbidities are a major public health concern worldwide. Nutraceuticals might be an alternative means to help lose weight without changes in the habitual diet and reduce associated cardiometabolic risk factors. The objective of the present study was to assess the efficiency of nutraceuticals combining oat beta-glucan (BG) extracts with different physicochemical properties and a decaffeinated green coffee bean extract (GCBE) on obesity-related biomarkers in overweight/obese subjects. A randomized, parallel, blind, dose-response pilot study was carried out in four groups of subjects (n=15) who consumed, during 6 weeks, twice a day, a nutraceutical containing low (3 g/d) or high (5 g/d) doses of 35% or 70% BG and a fixed amount of GCBE providing 600 mg/d of phenols. BG-35% presented 10 and 100 times higher molecular weight and viscosity, respectively, compared to BG-70%, which was twice as concentrated than BG-35%. Food intake, anthropometry and different cardiometabolic markers were assessed at the beginning and end of the intervention. According to the general model of variance with repeated measure analysis, levels of total-cholesterol, LDL-cholesterol, VLDL-cholesterol, triglycerides, alanine-aminotransferase, aspartate-aminotransferase, hemoglobin A1c, insulin, systolic blood pressure (SBP), total body fat% (TBF%), visceral fat% and waist and hip circumferences were reduced. Attending to ANOVA and Bonferroni tests, among the treatments, 5g-35% BG produced the great estreduction in LDL-cholesterol and 5g-70% BG was the most effective in lowering SBP and TBF%. In conclusion, 5g-70% BG was the most effective treatment and additionally, it produced the least bloating according to a subjective questionnaire.

Potencial RedOX

Miguel Martínez

The redox potential or electrochemical potential provides data on the oxide-reduction process, indicating whether the species found in it are in an oxidized or reduced state, depending on the E ° of each species (Normal reduction potential). The electrochemical potential will evolve throughout the process and knowing it will give us information on the phenomena that depend on it (oxidation or reduction risks), being able to carry out actions that help us reorient it.

Wine is changeable and to control it you have to use equipment that measures the values of its conservation, either in tanks or in barrels. The redox potential is measured in mV, indicating the state of the liquid in terms of oxidation and reduction.

In the case of:

• Musts: It will be the moment in which the values are maximum oscillating between 200mV - 300mV. Because we find O_2 dissolved in high proportions, the risk of oxidation is greater.

• Alcoholic and malolactic fermentation: The microbiological activity produces a significant drop in the electrochemical potential, reaching minimum values at this time.

• For proper wine conservation, the values must be between 0 - 150mV, the danger of oxidation beginning at 250mV.

This knowledge prompted AGROVIN to start carrying out research 5 years ago on what would be the measure of the RedOx Potential and that has made it possible to design and market various equipment, including ELECTROWINE that could measure this Potential in the difficult conditions of the winery.

Non-conventional and sustainable novel approaches for the valorization of lignocellulosic biomass as antioxidant

Manuel Salgado Ramos

Innovative alternative technologies are nowadays emerging for the recovery of polyphenols from plants as an alternative tool to traditional methods.[1-3] These techniques produce a low environmental impact since no organic solvent and low temperatures are required. Among these techniques, pulsed electric fields (PEF) and supercritical fluid extraction (SFE) have been shown to be promising for intracellular extraction from plant food materials.

The main goal of this study is the recovery of polyphenols from almond hull, an interesting source of antioxidants, by combining both PEF and SFE in a sequential process. For instance, although the combination of PEF + SFE has not been explored before, some previous studies have reported interesting results after the application of other non-conventional techniques, such us ultrasound assisted extraction (UAE). Therefore, the antioxidant activity of almond hull was evaluated after combining both PEF + SFE, thus demonstrating a new alternative route for the valorization of this biomass as source of antioxidants.

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Discrimination and quantification of quercetin nanoemulsions by liquid state SERS analyzer

Cristina Montes Correal

In the present work, the encapsulation of a lipophilic flavonoid such as quercetin in nanoemulsions has been optimized and developed by means of the phase inversion temperature (PIT) methodology [1].The final composition of the synthesis (% w/w) was 5.25% castor oil, 0.25% quercetin, 0.55% ethanol, 5% surfactant mixture (4.5% tween 80 and 0.5% quillaja saponin) and the remaining up to 100% was water. The synthesis showed excellent results related to encapsulation efficiency, 96%. Afterwards, then a no structural characterization of the quercetin-loaded nanoemulsions was carried out by several techniques such as UV-Vis, Raman spectroscopy, DLS and SEM. Based on raman and SERS profiles it was possible to discriminate between free quercetin and nanoquercetin. While drug or bioactive release systems have been developed, some limitations have should be overcome. One of the most important is the need to develop analytical tools allowing its characterization and quantification without altering its original state [2]. For this reason, a three-dimensional plasmonic sensor in liquid state with gold nanobones has been developed for Q-NEs quantification based on SERS magnification at 1600 cm^{-1} band. This sensor showed good analytical performance with lineal concentration range of 0.5 - 30 µM and detection limit of 0.4 µM. The developed analytical method was applied to the analysis of nanoquercetin in complex commercial matrices.

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Supercritical CO_2 extraction of natural antioxidants from lavender: process optimization and scaling-up

Encarnación Cruz Sánchez-Alarcos

The continuously growing demand of natural products in sectors such as food and pharmaceuticals has led to the search of natural sources rich in bioactive substances with beneficial properties for the human health. These substances can be added to foods, constituting the so-called nutraceutical products, or they can even be used in the synthesis of drugs, thus replacing the disadvantages of traditional medicines such as side effects or intolerance. One of the main commercial products derived from nature are essential oils, with the lavender essential oil as one of the most widely used. It stands out because it has compounds that have great antioxidant and anti-inflammatory capacity such as the linalool [1]. These properties would make it an effective substance for the treatment of skin diseases. In recent decades, the use of supercritical fluid extraction has proven to be effective for obtaining bioactive compounds from mixtures of several components like essential oils because of its versatility and environmental friendliness, thus overcoming the disadvantages of traditional extraction techniques. Carbon dioxide (CO_2) is the most widely used supercritical fluid, as it is inert, non-toxic and allows extraction at lower temperatures and pressures [2].

The present work focuses on the supercritical extraction of lavender essential oil for its application in drugs and nutraceuticals. The influence of pressure and temperature on the extraction yield and antioxidant capacity was studied. The composition of the extracts was determined by gas chromatography/mass spectrometry and the DPPH (2,2-diphenyl-1-picrilhidrazil) assay test was carried out in order to evaluate their antioxidant potential. In addition, a model for the simulation of the equilibrium system formed by lavender essential oil and supercritical CO_2 was developed with the aid of Aspen Plus commercial simulator to enable the subsequent scaling up and economic study of the process.

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Valorization of Agricultural Waste and CO_2 into Bioderived Cyclic Carbonates

María del Prado Caballero Espinosa

Society demands the development of new products and chemical processes that make our planet more sustainable. In the last few years, waste production has increased enormously, which has a huge negative impact on the environment. Among the produced agri-residues, vegetable oils have attracted much attention in the last decade for the design of new sustainable catalytic processes. On the other hand, the increase of carbon dioxide emissions in the atmosphere is one the main causes of global warming. For this purpose, highly efficient metal-free bifunctional organocatalysts[1] have been used for the synthesis of waste vegetable oils-derived cyclic carbonates from bio-derived epoxides and CO_2. In this contribution, epoxidized vegetable oils and carbon dioxide have been used as renewable feedstocks for the synthesis of waste vegetables oils derived cyclic carbonates in excellent isolated yields using the bifunctional imidazole based organocatalyst in the optimal reaction conditions without solvent.[2]

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Implementation of non-thermal technologies for wine microbiota control

Raquel Muñoz García

In the wine making process, the most important microbial species is undoubtedly *Saccharomyces cerevisiae,* responsible for alcoholic fermentation. On the other hand, lactic bacteria are responsible for carrying out the malolactic fermentation in red wine sand some white wines, so they should also be highlighted as beneficial microorganisms. However, there are others that can produce some kind of alteration, among which *Dekkera anomala* is worth mentioning [1]. The aim of this work was to study the effect of different microwave treatments on the vitality and viability of Saccharomyces cerevisiae, *Lactobacillus plantarum and Dekkera anomala,* chosen as representatives of the microbiota characteristic of the wine making process [2].

For this purpose, six different treatments were applied on fresh cultures with a population of 106 cfu/mL, varying the conditions of exposure time, power and pulses. Plate counts were performed to study the effect on viability, while changes in vitality were quantified by obtaining the kinetic parameters of the microorganisms once the treatment was applied. In all cases, YPD and MRS media were used for yeast and bacteria respectively. In parallel, controls were carried out for each of the strains without the application of microwaves. All tests were performed in quadruplicate. The results showed that in some cases the metabolism was attenuated, which was reflected in alonger lag phase, together with a loss of viability. At other times, no significant differences were observed with respect to the controls, and finally, sometimes cell death occurred, mainly in treatments carried out continuously, without the application of pulses.

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Bioavailability of a long-term low-dose administration of a grape seed extract in healthy male Wistar rats

Eduardo Guisantes Batan

Plant-based diets rich on polyphenols have outbreak as a powerful tool to prevent several metabolic disturbances provoked by inadequate diets and sedentary lifestyles. Between them, flavanols are one of the most consumed polyphenols in diets and have been reported to play an important role in health. However, the mechanism of action for these compounds are not fully understood [1]. To establish a clear relationship between intake of flavanols and effects in the prevention of diverse diseases is vital to understand the bioavailability of these compounds in the organism. Thus, we aimed to evaluate serum metabolites after a low-dose dietary administration of a grape seedextract (GSE) (25 mg/kg body weight/ day) in young-male Wistar rats for 28 days.

In first place, we approached the characterization of the GSE by spectrophotometric and chromatographic techniques (HPLC-QToF-MS) showing a high content on polyphenols, mainly flavanols with different degree of polymerization. Then, we proceed to analyse the serum metabolites by UHPLC-HR-MS considering the possible transformations suffered by flavanols through the stages of digestion, intestinal absorption, distribution and metabolization. Our results showed a rapid metabolization and elimination of the flavanols, the prevalence of sulphate and glucuronidated metabolites and the relevance of colonic metabolization, carry out by the microbiota, to increase the bioavailability of these compounds. These data might explain the possible metabolic effects of flavanols.

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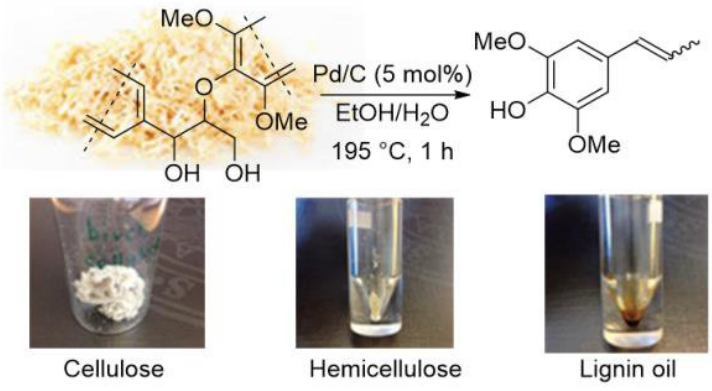
Catalytic fractionation of biomass, a pathway to obtain textiles, biofuels, and platform chemicals from renewable sources

Alberto José Huertas Alonso

Lignin-first processing is the broadly accepted umbrella term for solvent-based methods in which lignin preservation, together with that of the polysaccharides, is considered upfront, moving away from the current practice of having to deal with an intractable lignin product at the end of a biorefining process. The lignin-first process would be considered as an active stabilisation approach that liberates lignin from the plant cell wall and prevents condensation reactions through either catalysis or protection-group chemistry. Importantly, lignin-first biorefining is not a synonym for lignin valorisation, but rather an integral approach that derives value from both lignin and polysaccharides, towards an atom-efficient and more sustainable utilisation of lignocellulosic biomass. Most commonly, lignin-first processes involve three steps: (i) the lignin is removed from whole biomass using an organic solvent through solvolysis or acid catalysed reactions (similarly to organosolv pretreatment); (ii) the resulting intermediates are stabilised, with the intention of preventing condensation of reactive species generated by lignin depolymerisation, and (iii) further depolymerisation occurs if not fully depolymerised at the stabilisation stage.[1]



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Extraction and characterization of platinum nanoparticles from road dust

Armando Sánchez Cachero

In the last decades, metallic nanoparticles (NPs) are being widely applied in a very broad field of applications. Among them, the use platinum nanoparticles (PtNPs) has growns teadily due to their unique properties, especially in automotive catalytic convertors. Mechanical abrasion and chemical reactions occurring at the catalyst surface could lead to their emission all over the environmental compartments. However, information about the fate, bioavailability, or possible transformations that they may undergo on cein the environment is very limited [1]. Adequate methods for the detection, characterization, and measurement of PtNPs are needed to understand their behavior and assess possible associated environmental risks. In order to reach reliable information about PtNPs in complex environmental matrixes, a previous sample preparation step is required. This process is the most critical and laborious, especially for solid samples, such as road dust [2]. It should be carefully optimized to preserve all the NP properties (e.g., size, shape, or aggregation state), and concentration. Usually, chemical (an extractant agent) and physical (some type of energy) treatments are required. In the present work, an analytical methodology for the extraction of PtNPs from road dust is presented. Critical parameters, including extractant agent, extraction technique and sample: extractant ratio, have been optimized. Best results were obtained using ultrasonic energy and water as extractant. Single particle inductively coupled plasma mass spectrometry has been used for PtNP characterization and quantification.

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Metal extraction from mine tailings by bioleaching with an acclimatized mixed culture

Hassay Lizeth Medina Díaz

The metal mining sector has been an important pole of economic development inseveral European countries. However, the accumulation of mine tailings after the closure of the facilities has tiggered a negative environmental impact [1], derived from the high accumulation of heavy metals in the soil, the surface and underground water bodies. This situation could be worsened when waste get in contact with different environmental agents, such as wind and water due precipitation [2]. This work has studied the bioleaching of metals contained in mine tailings, using an adapted mixed culture by an acclimation stage to improve metals bioleaching. The mixed culture was taken from a real acid mine drainage. The physicochemical and microbiological parameters were controlled during the bioleaching experiments on the pregnant leach solution (PLS). After the bioleaching process Cu, Cd Pb and Zn were dissolved from the waste demonstrating that it could be possible to recover metals even from the discardedmine tailing [3].

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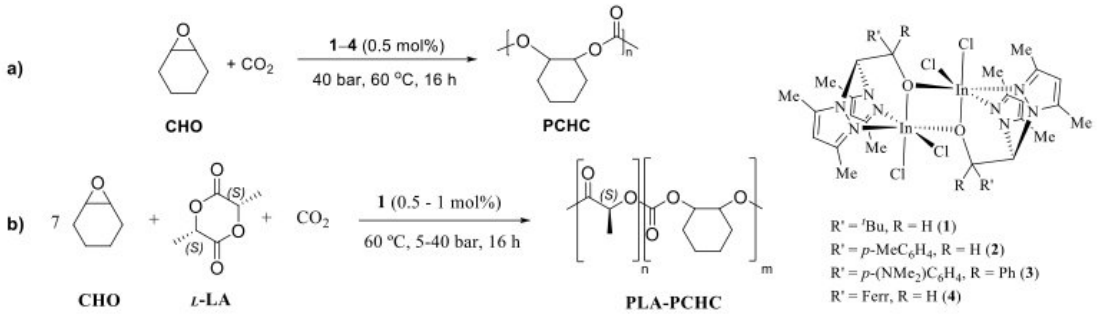
Synthesis of polycarbonates and terpolymers catalysed by heteroscorpionate indium complexes

Marc Martínez de Sarasa Buchaca

During the last years, the scientific and industrial community have focused on the development of new processes to transform CO_2 into high-value added organic chemicals and polymers.[1] In this context, it is worth highlighting the ring opening copolymerisation between epoxides and CO_2 to afford polycarbonates, which have found multiple applications.[2] More recently, terpolimerisation reactions between epoxides, CO_2 and cyclic anhydrides and/or cyclic esters have received much attention due to the possibility to fine-tune the properties of the resulting polymeric materials.[2] In this work, we report the synthesis of a new family of dinuclear chloride indium complexes (1-4) which have shown to be very efficient for the ROCOP of epoxides and CO_2 and the terpolymerisation reaction of cyclohexene oxide, CO_2 and L-lactide to afford polycarbonate and polyester-polycarbonate materials, respectively, with low tomoderate molecular weights and narrow polydispersity values (Scheme 1).



Scheme 1. a) Synthesis of PCHC and b) synthesis of PLA-PCHC.

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Monitoring air quality in Las Tablas de Daimiel National Park

Gabriela Viteri Tovar

Air quality is generally measured in urban and industrial sites. Nevertheless, anthropogenic activities can also contribute to the pollution of natural remote areas.The need for assessing such contributions to the air quality of protected areas is the motivation for the present study. This work reports field measurement data of O_3, NO_X, SO_2, CO and $PM_{2.5}$ from March 2020 to July 2021 in Las Tablas de Daimiel National Park, within "La Duquesa" weather station that belongs to the park. Pollutants were measured by analysers that were installed inside a thermostatic cabin. Data were registered every ten minutes and hourly, and then downloaded remotely. In addition, meteorological data (temperature, wind direction, wind speed, pressure, and humidity) were provided by "La Duquesa" to have a complete data set for this study.

The results show a substantial ozone concentration rise during June - September 2020 when the solar radiation intensity is higher than in winter months. Ozone values obtained (annual average= 69.3 mg/m^3) are slightly higher than the concentrations registered in urban monitoring stations (Red de Control y Vigilancia de la Calidad del Aire de la JCCM). This is consistent with other studies that observed higher ozone concentrations in areas far from emission sources. On the other hand, NO_x concentrations (annual average = 3.1 mg/m^3) are lower than values registered in the surrounding urban areas, also, they are below legal environmental parameters. The same behaviour was also observed for SO_2 and CO, with average values of 0.34 and 135.5 mg/m^3 respectively.

In the case of $PM_{2.5}$, there is no clear pattern during this study. Sahara intrusions have been considered in this study, observing that they present a small contribution to fine particles, which have an average "local" background value of 4.7 µg/m^3. The results show that concentrations of $PM_{2.5}$ are below the levels established by the legislation.

Near-infrared spectroscopy (NIRS) as a potential non-destructive tool in the evaluation of quality parameters of natural cork stoppers

Manuel López Viñas

The quality control of the cork industry includes different parameters related to the structure of the cork and its chemical composition, such as visual quality, extraction force, compression force, absence of olfactory defects or extractable chemical compounds. In this sense, the production of natural cork stoppers includes different sanitation steps such as hot water or steam washing and the use of hydrogen peroxide in order to reduce phenolic compounds, mainly tannins, and to eliminate microorganisms that can produce off-flavors [1]. Both, the analysis of off-flavors responsible for the defect known as “cork taint” and the analysis of phenolic compounds are carried out by precise conventional techniques that require time and previous preparation of the sample, so they cannot be included in the production lines. Due to the importance of the presence of olfactory defects in wine attributable to cork, most industries have a gas chromatography-mass spectrometry system, however, they lack analysis systems for phenolic compounds, which, like volatile compounds, can migrate to the wine affecting its color, astringency and bitterness [2]. On the other hand, cork is a source of phenolic compounds, which posess important antioxidant properties that could also migrate to the wine. Therefore, although a high content of phenolic compounds could modify the chemical and sensory properties of wines, their migration could also increase their antioxidant properties.

The aim of this study was the development of predictive models through the chemometric treatment of the data obtained by NIRS, for the rapid and non-destructive estimation of the total polyphenol content and antioxidant activity of natural cork stoppers, for which 132 samples of different visual qualities and perfectly characterized from its origin were used. The external validations carried out for each model indicated a good fit between the values obtained from the chemical analysis method, and the values estimated by the NIR calibration method. Therefore, NIR spectroscopy could be used as a rapid and non-destructive technique for the simultaneous determination of different chemical parameters in natural cork stoppers, such as total polyphenol content and antioxidant activity, and probably others of interest in the cork industry.

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A new analytical methodology for the assessment of platinum nanoparticles speciation in in vitro toxicological assays

Sergio Fernández Trujillo

The employment of platinum nanoparticles (PtNPs) has raised in numerous fields, especially in biomedicine due to unique physicochemical properties. Despite their use, there are limited data on their toxicity, and the possible harmful effects on human health [1]. Thus, it is necessary to perform toxicological studies for the assessment of the risks associated to NPs. To get reliable information about NP behavior and transformations in these complex biological media is still a challenging task and the development of new analytical methodologies for this purpose is needed. In that sense, one powerful alternative for metallic NPs is the hyphenation of separation technique, such as high performance liquid chromatography, to specific detector, as inductively coupled plasma-triple quadrupole mass spectrometry (HPLC-ICP-TQ-MS). It provides information about the characterization, and quantification of NPs, and dissolved species in complex matrices in a short period of time at low concentrations. Nevertheless, its applicability for the study of PtNPs in these types of samples should be demonstrated. Therefore, the goal of this work has been to develop and validate a new analytical methodology based on the use of HPLC-ICP-TQ-MS for the PtNP speciation including 5, 30 nm PtNPs, and dissolved Pt species upon dispersion in different cell culture media, such as Dulbecco's Modified Eagle Medium (DMEM), and Roswell Park Memorial Institute, RPMI-1640 suspensions, all supplemented with 10% fetal bovine serum, and antibiotics commonly used in in vitro toxicological assays. The presence of the cellular media induced transformations in these nano-sized particles over time (i.e., oxidation, and protein corona formation). Also, complementary techniques as dynamic light scattering, and scanning electron microscopy were used to study the hard, and soft corona formation. These results will be very useful to achieve an appropriate interpretation in future in vitro, and in vivo toxicological assays.

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Application of thermoregulating nanoPCM slurries for enhancing the thermal comfort of building materials

Daniel López Pedrajas

It is expected that the world energy consumption rises nearly 50 % by 2050. This quick and high growing energy demand can generated a depletion of resources, supply difficulties and destructive environmental impact. Spain has an average of 2500 hours of sunshine guaranteed per year, which translates into a wide potential for the development of solar thermal energy technologies. However, the intermittency of the solar energy is an important constraint, but the use of thermal energy storage (TES) in buildings can smooth this problem. Latent heat storage (LHS) is the most studied and promising TES technology. The materials used for the LHS are named phase change materials (PCM). These materials are able to absorb, store and release energy during the phase change. However, due to the solid-liquid transition, they must be suitably contained to prevent leakage. Nowadays the efforts of implementing these materials are focused on obtaining nanocapsules (NPCM), in order to increase the thermal energy surface for improving the heat transfer rate. The incorporation of the capsules in construction materials allows utilizing them in passive energy storage systems, reducing the building energy consumption and the CO_2 emissions because the dependence on fossil fuels is diminished.

In this work, a thermoregulating nanoPCM slurry was synthesized, which is constituted by NPCM containing the PCM dispersed in water. This nanoPCM slurry was made in only one single step, avoiding the waste generation. This slurry contains 38.5 wt.% of solid particles being able to be handled as water for producing the desired building materials. In this first approach, gypsum block containing up to 20 wt% of thermoregulating NPCM were produced by mixing this nanoslurry with the hemihydrate obtaining building materials that present a double purpose, the common structural one and as an insulating material having thermal energy saving properties (large TES capacity).

Could light treat cancer? New photoactivatable metallocomplexes as an alternative to current chemotherapies

Daniel Martínez Domínguez

Photochemotherapy emerges as a new non-invasive technique to improve the selectivity of current cancer treatments. In this therapy, a photosenitizer is administrated, which is ideally harmless in the dark, and activates in the presence of light. This approach has special interest in tumours that can be irradiated by light or cannot be removed by surgery (head, neck, skin…). More precisely, in photodynamic therapy (PDT) $^1O_2$ and reactive oxygen species (ROS) are generated, producing cancer cell apoptosis. This allows to design a light-driven chemotherapy in a spatio-temporal way. Iridium complexes with C^N ligands have been employed as photosensitizers in PDT mechanisms due to their photochemical properties. In this work, a new type of chloro-bridged dimer with π-extended ligands (C^N= benzo[a]pyrido-[2,3-c]phenazine; bppz) have been synthetized and new complexes $[Ir(C^N)_2(N^N)]^+$ are presented as potential candidates for PDT. Furthermore, fluorescence studies demonstrated that these compounds are luminescent, which can be useful to use them as probes in theragnosis devices. Cytotoxicity studies are being carried out.

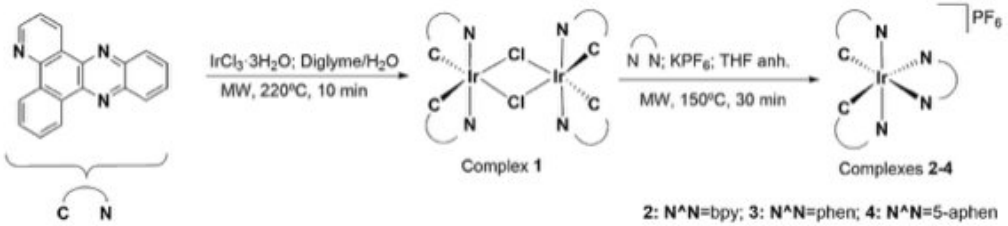

Figura 1. Synthesis scheme of Ir complexes with C^N (5-aphen: 5-aminephenanthroline).

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Soot characterization using different techniques

Inmaculada Aranda Díaz-Lucas

Soot is the carbonaceous particles formed during the incomplete combustion or pyrolysis of hydrocarbons[1], such as fossil or biomass fuel. It is well known that this pollutant has negative effects on the human health[2] and cause changes in the Earth's energy balance directly by absorbing the solar radiation and indirectly affecting cloud properties[3]. Depending on the fuel used and the generation conditions, the properties of the generated soot particles may change so it is important to characterize them. In this work, soot samples have been characterized using different techniques:

1. Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS) which provides information about the functional groups present in their surface.

2. EC/OC analyser, which allows to determine that mass fraction of elemental carbon (EC) and organic carbon (OC).

3. Scanning Mobility Particle Sizer (SMPS), to determine the particle size distribution.

For investigating the optical properties:

4. Photoacustic Extinctiometer (PAX), which measures the absorption and scattering of light at 870 nm.

5. Aethalometer, which measures light attenuation through a filter at seven wavelengths.

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CO_x-free hydrogen generation from ammonia by electrochemical promotion

Marina Pinzón García

Hydrogen (H_2) from renewable source seems to be potential green energy carrier to support a low carbon energy economy, using fuel cells and internal combustion engines by releasing only water such as by products. However, the main drawback related to this compound is its low volumetric energy density which increases storage and transport costs. An alternative to remove these issues is the use of hydrogen carrier compounds.

In this respect, ammonia (NH_3) is a promising hydrogen carrier because of its high volumetric energy density and high hydrogen content, well-known technology for production and distribution and relatively low cost[1]. Moreover, its decomposition only yields hydrogen and nitrogen. Therefore, NH_3 is an exceptional carbon-free hydrogen vector. However, to release H_2 contained in NH_3 it is necessary to develop a robust, efficient, and economic active catalyst at low temperatures, since high purity H_2 is necessary to be used in fuel cells. Promising results of NH_3 decomposition at low temperatures are achieved with ruthenium catalysts[1], although catalytic activity is influenced by adding promoters. The electrochemical promotion of catalysis (EPOC) is a promising alternative way to explore the in-situ addition of electronic promoters to an heterogeneous catalyst and hence, to enhance catalytic reaction rates[2].

In this work it has been explored for the first time in the literature, the effect of the electrochemical promotion for low temperature catalytic decomposition of ammonia (250-350 °C). For that purpose, a ruthenium catalyst and an alkaline solid electrolyte (Na-ßAl$_2$O$_3$ and K-ßAl$_2$O$_3$) have been used on the catalytic reaction.

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Determination of oxidative stress markers in the blood of Taeniopygia guttata using reversed-phase high-performance liquid chromatography coupled to electrospray ionization-quadrupole-time-of-flight mass spectrometry

Marina Córdoba Aceituno

The objective of the present work is the determination of oxidative stress markers at the systemic level, using birds of the Mandarin diamond species (*Taeniopygia guttata*) as study models, after an experimental induction of oxidative stress. This stress was produced through the contribution of a substance that decomposes into free radicals in the drinking water for 30 days, at the same time that the birds developed their plumage. A reversed-phase high-performance liquid chromatography (RP-HPLC) method coupled to electrospray ionization-quadrupole-time-of-flight mass spectrometry (ESI-QTOF-MS) was developed to identify and quantify the following markers of oxidative damage in plasma and blood cells of birds: 3-nitro-L-tyrosine, 3-chloro-L-tyrosine, 8-hydroxy-2'-deoxyguanosine and o,o'-dityrosine. For this, the different parameters that intervene in RP-HPLC-ESI-QTOF-MS were optimized and calibration curves were made from the pure standards of the indicated compounds. The samples presented a great complexity and a high quantity of interferents, so they were treated, achieving the precipitation of plasma proteins and the opening of blood cells, which allow us to analyze their content.

The analyses show the presence of oxidative stress markers in the samples. The prevalence differs between them, since 8-hydroxy-2'-deoxyguanosine, which is an important indicator of DNA damage, could be identified in relatively high concentrations in all samples, 3-chloro-L-tyrosine and o,o'-dityrosine were only detected in a small number of them. The results therefore indicate the relevance of 8-hydroxy-2'-deoxyguanosine as a global marker of physiological oxidative damage. They also show the production of other markers very poorly determined previously in non-model organisms in blood samples of birds, which opens the door to a greater diversification of potentially useful parameters in oxidative damage studies. These findings will be delivered to the company that requested them in order to carry out different studies on metabolomics and genetics.

Safety assessment of LAB strains to be used in food fermentations

Sara Rodríguez Sánchez

Lactic acid bacteria (LAB) are used in the food industry as starters or as probiotic cultures since many years ago, due to their potential beneficial effects on human and animal health. Their presence contributes to enhancing microbiological stability, increasing the conservation time, and to improve the organoleptic characteristics. LABs are considered GRAS (Generally Recognized as Safe) but their involvement in the pathogenesis of some infectious processes has been described, contributing to the appearance of bacteremia, endocarditis and localized infections [1]. Therefore, it is essential to assess their safety, before being used in industrial processes. Ninety-eight strains belonging to different LAB species were tested. The safety traits assayed were 1) the antibiotic resistance using the disc diffusion method 2) the presence of antibiotic resistance and amino acid decarboxylase (tdc, odc, ldc and hdc) genes by using specific PCRs 3) the production of biogenic amines (BA) by RP-HPLC, and 4) the production of different virulence factors such as the haemolytic, DNAse, and coagulase activities by using blood agar, DNAse agar and the BD BBL™ Coagulase Plasma, Rabbit Kit, respectively.

Differences between strains belonging to the same species, both in the antibiotic resistance and in the presence of antibiotic resistance genes were observed, confirming that antibiotic resistance is a strain-dependent property. PCR analysis of amino acid decarboxylase genes showed that the tdc gene was present in 13.3% of the strains, the odc gene was in 10.2%, the ldc gene was in 9.2% and the hdc gene was in 8.2% of them. Sixty-one percent of the strains were not biogenic amine producers or produced very low amounts of BA. The most produced amine was by far putrescine, followed by tyramine and cadaverine. In the assay for haemolytic activity, none of the strains were β-haemolytic nor showed DNAse or coagulase activities.

Based on these results, it can be concluded that the strains, *Levilactobacillus brevis UCLM-86, Levilactobacillus brevis UCLM-47, Levilactobacillus brevis UCLM-111, Lactiplantibacillus plantarum UCLM-93, and Lacticaseibacillus paracasei UCLM-24,* were the safest to be used in food fermentations.

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Naturally curved organic crystalline structures for waveguide and photonic circuits

Carlos Tardío Rubio

Organic crystals are excellent candidates for nanophotonic applications due to the excellent advantages they offer, such as tailor-made synthesis, excellent optical properties, easy processability and lightweight. As a disadvantage, they are usually stiffand fragile. However, the future technologies mandate flexible nanophotonic devices, so we need crystals with higher flexibility.[1]

In this work, we have synthesised an alkynyl derivative of benzene (**1**) that aggregate in naturally bent flexible crystals. In addition, these crystals have optical waveguide behaviour with low values of optical loss. From crystals interconnected and cutting with an AFM cantilever in the desirable locations, we obtained T- and triangular-shaped photonic circuits that allow the flow of light depending upon the excitation point.[2]

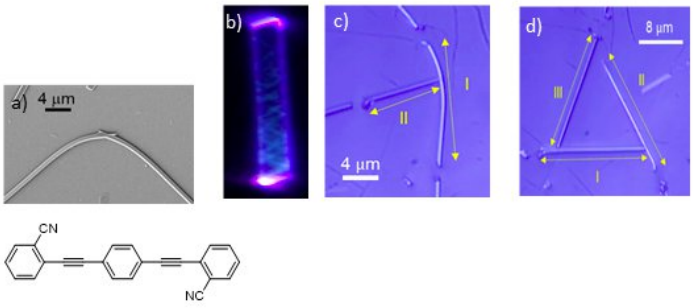

Figure 1: a) FESEM image of the bent crystal. b) PL image of the crystal. c) T-shaped and d)Triangular-shaped photonic circuits.

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Subolesin/Akirin: A multi arthropod vaccine antigen

Sara Artigas Jerónimo

Ticks are obligate hematophagous arthropod vectors of pathogenic viruses, bacteria, protozoa and helminths responsible for highly prevalent tick-borne diseases (TBDs) with animal and human growing incidence worldwide. Ticks are the second most common arthropod vectors, after mosquitos, for human health and the most important in domestic animals. Vaccines constitute the most environmental-friendly and efficient approach against ticks and TBDs in comparison with other traditional methods. Although vaccine efficacy against these and other arthropods had been previously described, the necessity of improving vaccine formulations combining protective antigens, as interacting proteins involved in the interactome or key physical or functional proteins interactions, is more evident every day. Subolesin/Akirin are proteins that have been conserved throughout the metazoan and play an important role in the cell interactome and regulome in response to pathogen infection and other biological processes. The conserved functional evolution of Subolesin/Akirin correlates with the protective capacity shown by these proteins in vaccine formulations for the control of different arthropod and pathogen species [1]. The identification and characterization of these proteins regulome and interactome is crucial to advance in the complete physiological context improving new vaccine formulations by combining Subolesin/Akirin with their interacting proteins for the control of multiple ectoparasite infestations and pathogens infection. Furthermore, we proposed a novel combined scientific and artistic approach for the advanced characterization of Akirin2 interactome. Thus, focusing on proteins involved in cell interactome and regulome through protein-protein interactions for the regulation of multiple biological processes involved in vector-host-pathogen interactions led to Quantum Vaccinomics, the combination of protective epitopes or immunological quantum to develop vaccines “to control them all” [2].

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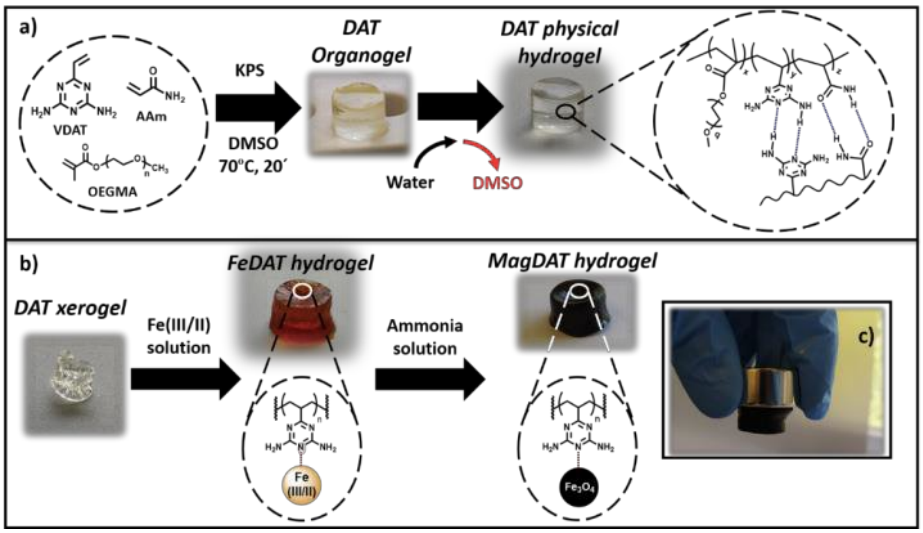
Magnetically responsive hydrophobic pockets for on-off drug release

Jorge Leganés Bayón

The vast majority of drugs available on the market are hydrophobic compounds. As a result, their poor water solubility can critically compromise the overall absorption of these drugs by patients. Although numerous different strategies have been developed to improve their bioavailability, the controlled delivery of these drugs is still a challenge. In this sense, stimuli-responsive hydrogels could be a solution to improve administration and stable release. However, the strategies required to render hydrogels hydrophobic mostly rely on weak hydrophobic interactions, which can lead to disassembly of the system and undesired burst discharge. Accordingly, the on-demand release of poorly water-soluble drugs is still a major milestone in this field. To circumvent these setbacks, we present for the first time a hydrophobic, magnetically responsive hydrogel based on the diaminotriazine (DAT) skeleton. The versatility of DATs in terms of H-bond formation and metal complexation simultaneously endows the hydrogel with hydrophobicity and magnetic responsiveness, thus allowing both the efficient loading and on-off release of a model hydrophobic drug as well as of a hydrophobic growth factor. Theoretical calculations further suggested stable formation of DAT aggregates that operate as efficient hydrophobic cavities or “pockets” for these compounds.



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Determination of ZnO NPs in Yeast and wheat flour sample by single particle ICP-MS

Samah Lahouidak

Single-particle inductively coupled plasma mass spectrometry (spICP-MS) is a potential approach for detecting metal-containing nanoparticles (NPs) and quantifying their size and content. Whereas previous research has mostly focused on NPs suspended in aqueous matrices, nothing is known regarding the applicability of sp-ICPMS for NP identification in complex matrices such as yeast and wheat flour samples. In the current research, Alkaline and Enzymatic treatments were used to solubilize yeast and wheat flour samples that had been spiked intravenously with Zinc nanoparticles (ZnONPs). The finding revealed that regardless of the sample preparation techniques employed, comparable size distribution of ZnONPs produced. Furthermore, the quantitative findings for ZnONPs mass concentration obtained with spICP-MS after enzymatic digestion pre-treatment agreed with the findings for total zinc concentration obtained from acid-digested samples using conventional ICP-MS. However, the recovery of ZnONPs from alkaline degraded samples was substantially lower.

Production of GABA-enriched sheep's milk yoghurt using selected *Lactobacillus* strains

Inés María Ramos Monge

Gamma-aminobutyric acid (GABA) is an inhibitory neurotransmitter of the mammalian central nervous system, found in plants, animals and microorganisms. GABA has numerous health-promoting functions, including lowering blood pressure, modulation of mood, memory and mood disorders, as well as beneficial effects in the treatment of epilepsy, diabetes and cancer. The production of this amino acid by lactic acid bacteria (LAB) has been demonstrated. Within these, the genera most commonly used in food production are *Lactobacillus, Leuconostoc y Lactococcus.* In particular, the genus *Lactobacillus* has been the subject of numerous studies on GABA production since, in addition to being a group of bacteria considered GRAS (*Generally Recognized as Safe*), there is a wide variety of strains of the different species capable of producing this compound. Therefore, the production of foods fermented by these bacteria, which can also be a source of GABA for the consumer, has recently been sought.

The aim of this work was, on the one hand, to evaluate the capacity to produce GABA by different strains belonging to the genus Lactobacillus, in order to select the most productive ones to be used in the production of yoghurt. And, on the other hand, to produce yoghurts from semi-skimmed sheep's milk with these bacteria in order to obtain health-promoting products with significant amounts of GABA. The experimental yoghurts elaborated presented high concentrations of GABA significantly higher ($P<0.05$) than the controls, and showed good sensory characteristics and were positively valued by the sensory panel.

Astrochemistry in the Laboratory

Sergio Blázquez González

In 1953, Stanley L. Miller[1] conducted an experiment where, from simple molecules, obtained prebiotic molecules as amino acids. This experiment that simulated the first moments of the primitive Earth may be a possible explanation for the origin of life. These simple molecules, in addition to many others, have been found in molecular clouds in the interstellar medium (ISM). The study of chemistry in such extremely cold environments (T=10 – 100 K) is fundamental to understand how more complex molecules can be generated, just as it happened in the Miller's experiment. In our laboratory, gas-phase kinetics of the reactions of OH radical (ubiquitous in the ISM) with simple molecules present in ISM are carried out with the pulsed CRESU system.[2-6] To reach the typical temperatures of the ISM the gas mixture is expanded through a Laval nozzle from a high to a low pressure chamber. Currently, our CRESU system achieves temperatures between 11.7 and 177.5 K, avoiding gas condensation on the reactor walls. This technique, together with the *Pulsed Laser Photolysis* coupled to *Laser Induced Fluorescence* technique, allows us to determine the rate coefficient of these reactions in gas-phase at ultra-low temperature, contributing to the improvement of astrophysical models to have a greater and better knowledge of the evolution of the cosmos.

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Optimum Experimental Design: "Think before you act"

Sergio Pozuelo Campos

There is currently a growing interest in the study of experimental design, since it is a fundamental part of the scientific method. Data analysis will be informative only if the data themselves are informative [1]. Experimental sciences and engineering are fields of knowledge especially interested in obtaining models that adequately explain the phenomena under study. Obtaining accurate estimators of the model parameters is, among others, a desirable property to obtain the best quality of statistical inference. For this reason, the data collection strategy becomes a crucial point for the good development of the study where economic factors and practical constraints come into play. The main objective of the Optimal Design of Experiments (DOE) is to determine where to take the observations and how often to optimize some aspect of the model in an efficient way. This paper presents a general introduction to this theory, highlighting some of the models approached by the Optimum Experimental Design group [2] from this perspective. Some of them are used for the calibration of instruments used in radiotherapy, to explain the effect of a drug on tumor cell death, to detect the phenomenon of hormesis or for survival analysis.

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Tuning the Cytotoxicity of bis-phosphino-amines Ruthenium(II) para-cymene complexes for clinical development in Breast Cancer

Elena Domínguez Jurado

Even knowing the severe toxic side effects and the intrinsic or acquired resistance manifested in various types of cancers, platinum compounds as therapeutic agents are held in high regard. In this context, organometallic ruthenium(II) compounds are proposed as a viable alternative to the platinum therapy because they are less toxic and present an ideal template for both high-throughput and rational drug design. To support the preclinical development of bis-phoshino-amine ruthenium compounds in the treatment of breast cancer, we carry out chemical modifications in the structure of these derivatives to aim at the design of less toxic and more efficient therapeutic agents. We report new bis-phoshino-amine ligands and the synthesis of their ruthenium counterparts. The novel ligands and compounds were fully characterized, studied their water stability, and evaluated their citotoxcity *in vitro* against a panel of tumour cells which compile the three breast cancer subtypes. The mechanism of action of the lead therapeutic of the series was studied. *In vivo* toxicity assessment was accomplished for further clinical evaluation. The results obtained might pave the way for the clinical development of these compounds in breast cancer therapy.

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Electro-scrubbing for the removal of Volatile Organic Compounds (VOCs) from gaseous streams

Andrea Nataly Arias Sánchez

At the present time, one of the most relevant environmental issues is removal of volatile organic compounds (VOCs), and electro-scrubbing has been found to be very promising technology to face this challenge (1). The main objective of this study is to evaluate the benzene removal from gaseous streams through a process which combine absorption and electro-oxidation (electro-scrubber). The experimental setup consists of a packed absorption column and a flow electrochemical cell (BDD as anode and stainless steel as cathode). Influencing factors such as gas flow rate and current density had been studied. The evolution of the concentrations of benzene and reaction intermediates, in liquid and gaseous streams, were measured by gas chromatography with mass spectroscopy (GC-MS) and high-performance liquid chromatography (HPLC). Results showed that, at 3 and 6 l/h of inlet gas flow rate, the absorption rate of benzene is greater than its degradation rate. Additionally, the optimized flow was determined to be 1,5 l/h. In all cases, electro-scrubbing demonstrated to be functional to absorb and eliminate benzene through anodic oxidation mechanisms. On the other hand, it was found that using a current density from 30 to 100 mA/cm^2 the elimination efficiency of benzene was over 90% and phenol, quinones and carboxylic acids were identified as intermediates. These findings allowed to suggest a mechanistic model for the benzene degradation which consists at first in its transformation into phenol to start phenolic oxidation pathways where carboxylic acids are produce from quinones before their mineralization. This study gives valuable information about the performance of electro-scrubbing, and results conclude that this gas treatment device can be a powerful technique for benzene removal.

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Acknowledgements

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New naphthalenimide derivatives with application in organic photonics

Beatriz Donoso Jurado

We live in an increasingly technological world, where technologies based on light and photonics have been fundamental in the vertiginous development of many disciplines such as communications, medicine and robotics.[1]

This evolution would not have been possible without the parallel development of new materials with improved performance, among which organic compounds have played a very prominent role. Organic materials have attracted increasing attention due to their low cost, easy fabrication, and tunable properties.

In this sense, we have synthesized three new compounds based on the branched nucleus of 1,8-naphthalimide with different alkynyl donor groups and we have studied their ability to transmit and amplify incident light, that is, their ability to behave as optical waveguides [2] and lasers [3]. Two of these compounds have shown behavior as lasers and one of them as a red and green optical waveguide.

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Kinetic and formation of SOA from ozonolysis of trans-ß-methylstyrene

Alba Escalona Verbo

Atmospheric aerosols are considered as one on the main uncertainty sources in the current understanding of the Earth's climate[1]. The formation of aerosols can be observed from the reaction of different VOCs (Volatile Organic Compounds) with atmospheric pollutants. In the present work, we have studied the kinetic rate constant and formation of SOA (Secondary Organic Aerosol) from the ozonolysis of alkene; this reaction proceeds through the formation of a Criegee intermediate (CI). Recently, it has been found that stabilized CI (sCI) can undergo reactions with SO_2 several orders of magnitude faster than assumed so far[2] producing SO_3, which contributes efficiently to the formation of ground level sulfuric acid[3]. Styrene and derivates as a-methylstyrene or trans-ß-methylstyrene are toxic to humans and considered to be one of the most important secondary organic aerosol (SOA) precursor[4]. These aromatics compounds can be emitted into the atmosphere from different sources such as solvents, combustion, building materials, adhesives and industrial processes[5]. In this context, the formation and growth of new SOA are evaluated in this work from ozonolysis of trans-ß-methylstyrene.

The reactions have been carried out in a Teflon chamber filled with synthetic air mixtures at atmospheric pressure and room temperature. The kinetic rate constant has been studied with absolute and relative method by GCMS (Gas Chromatography Mass Spectrometry) and the particle formation has been followed by a SMPS (Scanning Mobility Particle Sizer) and a CPC (Condensation Particle Counter). The main parameters for their characterization are nucleation, influence of different amounts of reagents including effect of water vapor and effect of different SO_2 concentration.

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Towards turbulence with an alternating Schwarz Legendre collocation method for a convection problem

Dario Martínez

An alternating Schwarz domain decomposition Legendre collocation method for a Rayleigh-Bénard problem is presented in this work [1,2]. The problem is modeled with the incompressible Navier-Stokes equations coupled with a heat equation in a rectangular domain. The Boussinesq approximation is considered. The nonlinearity is solved with a Newton method. Each iteration of the Newton method is dealt with an alternating Schwarz domain decomposition method in the horizontal variable, where each domain is solved with Legendre collocation. Thanks to this domain decomposition the aspect ratio and the Rayleigh number can be increased without limitation by adding domains. The computational cost is abordable because the method is parallelizable. Other advantage is high order.

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Mosquitoes and West Nile

Laia Casades Martí

West Nile Virus (WNV) is a neuropathic virus for humans, horses and birds transmitted by mosquitoes. Wild birds are natural reservoirs for WNV and, in liaison with competent mosquitoes, responsible for their maintenance and transmission. In Spain, the link between species involved is not yet understood, especially in areas without declared outbreaks. Aiming to deepen in the ecology of flaviviruses at the wildlife-livestock-human interface, we carried out several samplings in horse farms in 1) Ciudad Real and 2) Toledo between 2018 and 2019. We differentiated three sites per farm: i) the farm; ii) a site 500-1,000m away from the farm; and iii) a site at a 3-5 km distance from the farm without livestock. Mosquitoes were captured with specific traps fortnightly. Additionally, blood samples, oral and cloacal swabs, and growing feathers from wild birds (n=580) were sampled. Specific antibodies anti-WNV were detected with a commercial blocking ELISA Kit and WNV RNA was amplified through PCR. Furthermore, sera of 2418 wild ungulates (Cervus elaphus and Sus scrofa) from Doñana National Park (A1), Western Sierra Morena (A2), Central Sierra Morena (A3), Guadiana river Valey (A4) and Toledo Mounts (A5) between 2005-2019 were tested with the same ELISA Kit. Regarding wild birds, anti-WNV specific IgGs were detected in 28/451 (6.2%), the highest proportion of positives occurring in the farms (8.1%) in comparison to sites ii and iii (4.6% and 5.8%, respectively). Besides, four of 503 (0.8%) were positive to Flavivirus in PCR test. The proportion of exposed ungulates was higher in A1 (33.5%) and A2 (35.3%) than in A3 (18.7%), A4 (20.3%) and A5 (18.7%), shaping the contrasting reported incidence of WNV outbreaks in southern (n=189) and south-central (n=2) Spain. Mosquitoes are currently under analysis. The presence of *Culex pipiens*, the main transmitter of the virus, has been confirmed in sites 1 and 2. These findings corroborate the active circulation of flaviviruses in continental Spain and, especially, close to horse farms. In addition, wild ungulates prove to be efficient predictors for Flavivirus spatiotemporal dynamics.

Synthesis of metallic nanoparticles by spark ablation. Application in surgical facemasks

Raúl López Martín

Spark ablation is a simple, quick, and easy scalable technique for gas-phase synthesis of nanoparticles. By applying a high voltage between two electrodes an aerosol of the desired nanoparticles can be produced, in contrast with the usual liquid solution obtain by 'wet chemistry' methods. The size of these nanoparticles as well as the agglomeration between them can be tuned by varying the operational parameters[1]. Said nanoparticles can be collected into a porous substrate by passing the aerosol through it. In this case, Ag nanoparticles have been deposited in commercial surgical facemasks to study the promising antiviral performance against SARS-CoV2. In this communication the versatility of a spark ablation source when producing multielement nanoparticles is also pointed out as it enables both simultaneous and sequential production[2].

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Nickel electrodes prepared by magnetron sputtering for water and ethanol-water hybrid electrolysis

Ester López Fernández

Hydrogen is considered as a feasible alternative energy vector and can be obtained by different process. Water electrolysis is recognized as a sustainable and environmentally friendly alternative to produce hydrogen. On the other hand, ethanol electrolysis has been proposed as a promising method to produce hydrogen with lower power demands, since part of the energy required for electrolysis is provided by the organic molecule. We have proposed the use of Magnetron Sputtering (MS) technique to prepare nickel-based electrodes. The developed electrodes have been tested for water electrolysis and for ethanol-water hybrid electrolysis (simultaneous water and ethanol electrolysis). In this study, the influence of different fabrication and operation parameters of nickel electrodes has been tested in a three-electrode glass cell and in an Anion Exchange Membrane Water Electrolysis (AEMWE) cell (see Fig. 1 a)). The current density obtained for the same voltage is higher for hybrid water electrolysis than that for the pure water splitting (see Fig. 1 b)). Finally, a great stability and efficiency in relation to the amount of catalyst has been obtained demonstrating the high potentiality of the MS method.

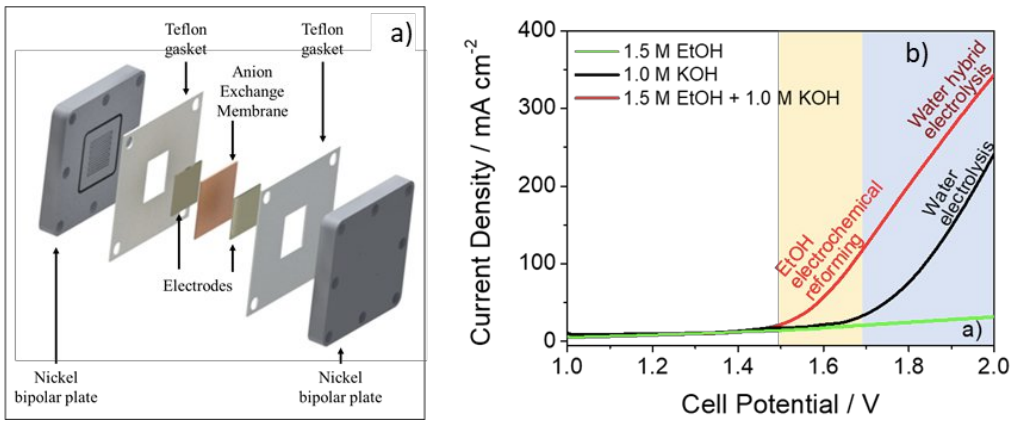

Figure 1. a) Exploded view of a complete electrolysis cell and b) current-potential curves for water andethanol-water hybrid electrolysis.

Photopolymerizable chitosan hydrogels for tissue engineering

Irene San Millán Rodríguez

The field of tissue engineering has the potential to transform how we treat pathologies and diseases that cause tissue damage, by repairing, regenerating, or improving the function of the damaged tissue. A key concept in tissue engineering is the use of biomaterials to support the growth of new cells and promote repair. Of the many types of materials that have been used in tissue engineering, hydrogels have emerged as one of the most prominent and versatile. Hydrogels can be designed to support cell proliferation, migration, and differentiation, to permit oxygen and nutrient transport, and to provide cells with a 3D, highly hydrated environment that mimics native soft tissues. Careful design of the underlying polymer scaffold is therefore vital, dictating both the physical and biological properties of a hydrogel [1].

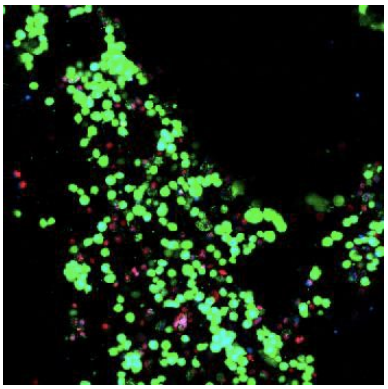

Figure 1. Cell culture in chitosan hydrogels.

In this work, we highlight chitosan-based hydrogels as suitable scaffolds for tissue engineering applications (**Figure 1**). Chitosan is a partially deacetylated form of chitin and it occupies a distinct position amongst other biomaterials due to its abundance, versatility, biocompatibility and anti-fungal properties [2]. To increase the mechanical strength and structural integrity of this biomaterial, we have introduced acrylamide as a copolymer. Besides, the addition of nanomaterials such as graphene [3] and magnetic nanoparticles [4] will allow us to tune the biological response of cell cultures in our scaffold by increasing cell adhesion and controlling cell fate using external stimulation.

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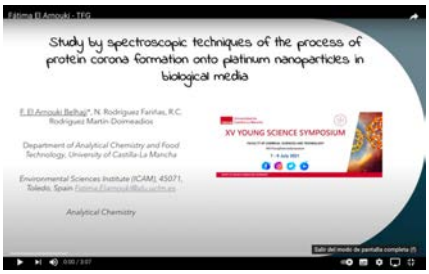

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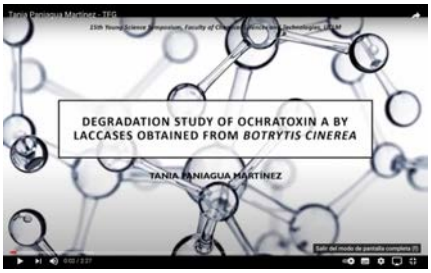

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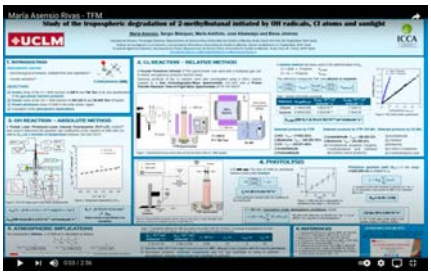

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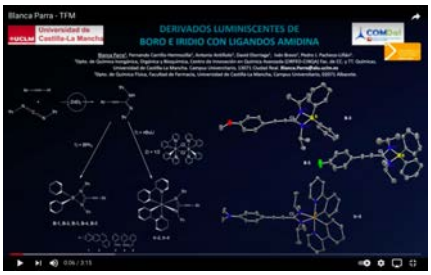
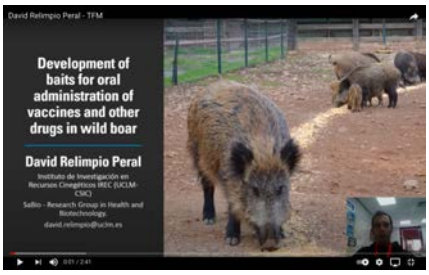
Blanca Parra

"Derivados luminiscentes de Boro e Iridio con ligandos amidina"



David Relimpio Peral

"Development of baits for oral administration of vaccines and other drugs in wild boar"



Abelardo Sánchez Oliva

"Rational Design of Naphthalenimide and perylenimide derivatives with application in organic field-effect transistors (OFETs)"

Álvaro Sánchez Sánchez

"Perovskites as catalytic precursors in ammonia decomposition"

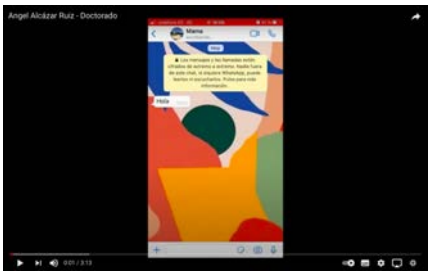
COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

Categoría Doctorado

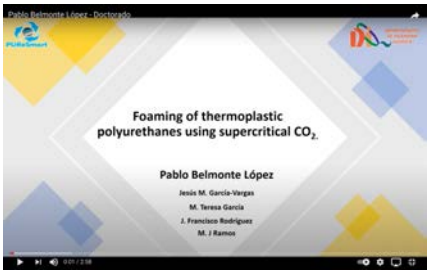
Ángel Alcázar Ruiz

"Value-added bioproducts production through waste biomass fast pyrolysis"



Manuel Bartolomé Díaz

“Voltammetric sensing of fluoroquinolones in commercial food daily products at chitosan - gamma cyclodextrin - graphene quantum dots modified carbon screen printed electrodes”



Pablo Belmonte López

"Foaming of thermoplastic polyurethanes using supercritical CO_2"

Fernando Carrascosa Simón

"PLGA foaming via supercritical CO_2 for tissue engineering application"

Rodrigo de Mello

"Combination of adsorption and electrochemical oxidation processes to remove VOCs"

COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

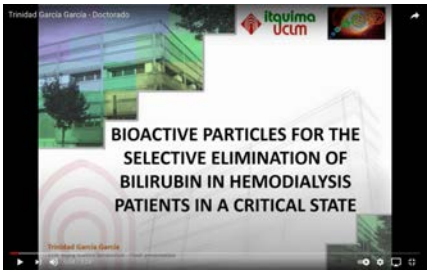
Categoría Doctorado

Rafael Delgado García

"Permalloy thin films on V-groove patterned substrates for sensoring and biological applications"

Yelitza Delgado Gonzalez

"Real Acid Mine Drainage Treatment by Bioelectrochemical System"



Trinidad García García

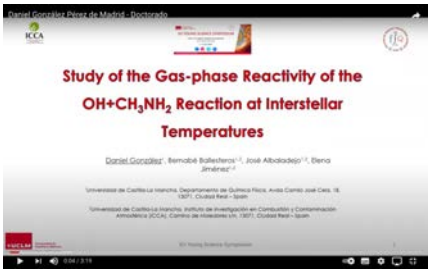
"Bioactive particles for the selective elimination of bilirubin in hemodialysis patients in a critical state"

Celia Gómez Sacedón

"A simple preliminary design of self-support power supply based on Hydrogen and Photovoltaic technology"

Daniel González Pérez de Madrid

"Study of the Gas-phase Reactivity of the $OH+CH_3NH_2$ reaction at Interstellar Temperatures"



COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

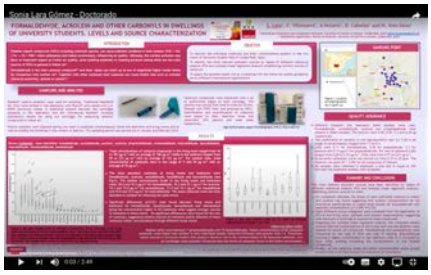
Categoría Doctorado

Rafael Granados Fernández

"Design of Electrochemical Reactors for the Removal of Pollutants from Gaseous Streams"

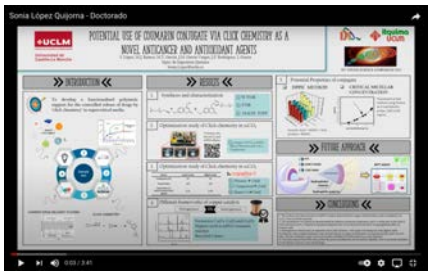
Jesús Herrera Herreros

"Magnetic acrylamide hydrogels: SPIONs in situ"



Sonia Lara Gómez

"Formaldehyde, acrolein and other carbonyls in dwellings of university students. Levels and source characterization"



Sonia López Quijorna

"Potential use of coumarin conjugates via click chemistry as a novel anticancer and antioxidant agents"

Carolina Montoya Vallejo

"Biomass and Lipid Production by the Native Green Microalgae Chlorella sorokiniana"

COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

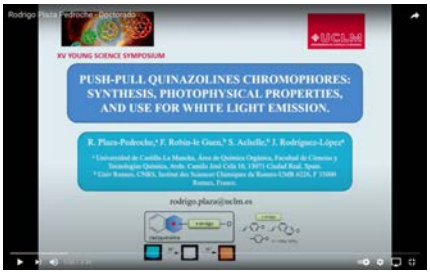
Categoría Doctorado

Víctor Pertegal Perez

"Treatment of bioaerosols with electrochemically generated oxidants"

Esther Pinilla Peñalver

“Resveratrol adsorption at graphene quantum dots surface: a promoting strategy to increase its photochemical stability in food products”



Rodrigo Plaza Pedroche

"Push Pull quinazolines chromophores: synthesis, photophysical properties and use for white light emission"

Carlos Rivera Cabanillas

"Study and Characterization of Chemical Pigments for Artistic Painting"

Alberto Sánchez Cano

"Unravelling the interface: farm connectivity provided by spotless starling (Sturnus unicolor) movements"

COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

Categoría Doctorado

Ángela Moratalla Tolosa

"Improving the biodegradability of hospital urines by electrochemical advanced oxidation processes"

Josue Muñoz Galindo

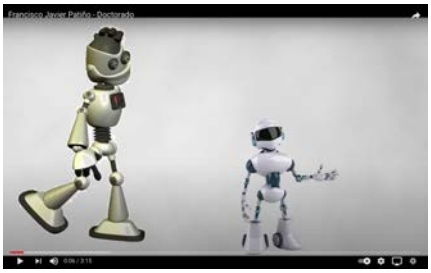
"Graphene-based sulfonate hydrogels: Soft scaffolds for cell culture"

Sonia Muñoz López

"Resveratrol as a possible modulator of adenosinergic system in HeLa and SH-SY5Y cells"

Rodrigo Oliver Simancas

"Mango by-products extracts as a promising therapy for glioblastoma T98 and A172 cells: communicating science through the viral TikTok platform"



Francisco Javier Patiño

"Hydrogels in soft robotics"

COMUNICACIONES FLASH

Haz click en el vídeo para ver la comunicación flash

Categoría Doctoras

Beatriz García-Bejar Bermejo

"Potential probiotic and food protection role of wild yeasts isolated from pistachio fruits (Pistacia vera)"

Viviana González Velázquez

"Synthesis of 2D Nanomaterials"

PREMIOS DEL XV YOUNG SCIENCE SYMPOSIUM

Como en ediciones anteriores, el comité organizador del XV Simposio de Ciencia Joven hizo entrega del VI Premio Ciencia Joven en el acto de clausura del evento. En esta edición, el premio ha sido otorgado a **Marc Martínez de Sarasa Buchaca** con el trabajo titulado "Synthesis of polycarbonates and terpolymers catalysed by heteroscorpionate Indium complexes" del área de Química Inorgánica.

¡Enhorabuena!

PREMIOS DEL XV YOUNG SCIENCE SYMPOSIUM

Por primera vez, en esta edición existe una nueva categoria denominda Flash Presentation. Esta se divide en categoría de redes, categoría doctorados, categoría TFM y categoría TFG.

El **I Premio Redes Sociales** se otorgó a:

Sonia Muñoz López

En la categoria de Redes Sociales se hizo una mención especial como finalista a:

Blanca Parra

PREMIOS DEL XV YOUNG SCIENCE SYMPOSIUM

El I Premio virtual Flash Communication en la categoría de **Estudiante de Doctorado (PhD)** se le otorgó a:

Rodrigo Oliver Simancas

El I Premio virtual Flash Communication en la categoría **Trabajo de Fin de Máster (TFM)** se le otorgó a:

Alicia Jiménez de la Torre

El I Premio virtual Flash Communication en la categoría de **Trabajo de Fin de Grado (TFG)** se le otorgó a:

Victor Lara Avia

¡Enhorabuena a los premiados!

PREMIOS DEL XV YOUNG SCIENCE SYMPOSIUM

Comité Científico y organizador

Comité Científico:

Manuel Andrés Rodrigo Rodrigo, Dean of Faculty

María Antonia Herrero Chamorro, 'Vice dean of Faculty & President from STCLM de la RSEQ'

Sergio Gomez Alonso, 'Vice dean of Faculty'

Gema Dura Gracia, 'Inorganic Chemistry'

Ana Raquel de la Osa Puebla, 'Chemical Engineering'

Elena Alañón Pardo, 'Food Sciences and Technology'

Antonio M. Rodríguez García, 'Organic Chemistry, EYCN-JIQ-RSEQ, CM Faculty'

PREMIOS DEL XV YOUNG SCIENCE SYMPOSIUM

Comité Científico y organizador

Comité Organizador:

Eduardo Guisantes Batán, ‘Food Sciences and Technology’

Esther Pinilla Peñalver, ‘Analytical Chemistry’

Alba Escalona Verbo, ‘Physical Chemistry’

Iván Torres Moya, ‘Organic Chemistry’

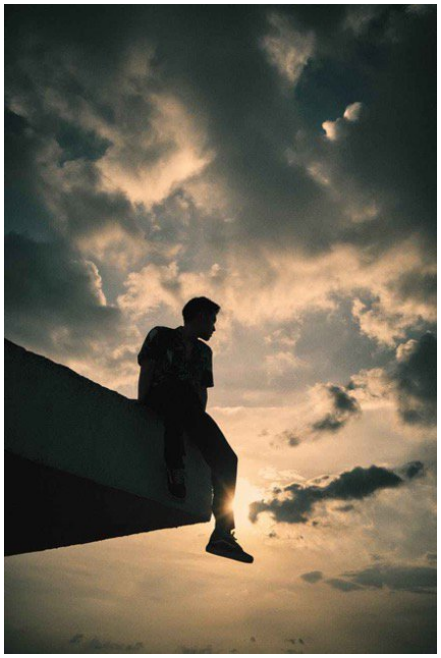
Raúl López Martín, ‘Physics’

Pablo Belmonte López, ‘Chemical Engineering’

Margarita María Villar Rayo, ‘Biochemistry’

EXPERIENCIA EN EL SYMPOSIUM

Nuestro mejor futuro



La semana pasada tuve ocasión de participar como jurado de unos vídeos de divulgación científica dentro del Simposio Ciencia Joven, que organiza la Facultad de Ciencias y Tecnologías Químicas de Ciudad Real. En concreto, los videos pretendían mostrar durante tres minutos la labor que se realiza en Trabajos Fin de Grado, Trabajos Fin de Máster y en Doctorado. No se consideraba en este caso el contenido científico de los resultados, eso ya tiene otra valoración con premio incluido. Lo que se reconoce es la calidad a la hora de la divulgación, la originalidad (no exenta de rigor ni de resultados), la capacidad de enganchar, de llamar la atención como paso previo a esa misteriosa cosa que es la difusión de los resultados. Pero destinado a la sociedad real, no a cuatro casposos que leen revistas elitistas cuyo contenido poco o nada trasciende al pagano de a pie. **Esas revistas que sirven para establecer el ranking también docente y que se supone que jamás están dominadas por lobbies equivalentes en ciencia a los de los negocios o la política**. En absoluto, juas, juas.

Pues participar como jurado me ha permitido reconciliarme con el género humano. He tenido ocasión de conocer gran parte de las líneas de investigación que desarrollamos en la facultad. Son fascinantes, estudios aplicados, no teóricos. Soluciones viables a problemas medioambientales, para eliminar residuos o aprovechar subproductos. Para darles uso combatiendo enfermedades como el cáncer o desarrollando nuevos materiales que permitirán desarrollar mejores fármacos o que los robots similares a los humanos sean una realidad. **El futuro que soñamos y la labor lógica a la que destinar los dineros que todos hemos exigido en los tiempos de covid, ¿verdad?** Pero eso no es nada. Lo auténticamente importante es la pasión con la que la gente hace y habla de su trabajo. Estos eslabones de la cadena de conocimiento y del desarrollo de la ciencia, los más nuevos, son los mejores. **Los más altruistas, los más desinteresados, los más solidarios y los más comprometidos con lo que se hace para mejorar el mundo. Me descubro.**

Photo by Public Domain Pictures on Pexels.com

Nuestro mejor futuro

Con un par, amigos. Pero, además, está la labor de difusión a la que aludía. La mayor parte de esos 44 vídeos son impresionantes, y no hablo como profesor. Hablo como espectador, como masa social. Muchos de ellos no es que sean buenos, es que son de lo mejor que he visto en cualquier medio de comunicación.

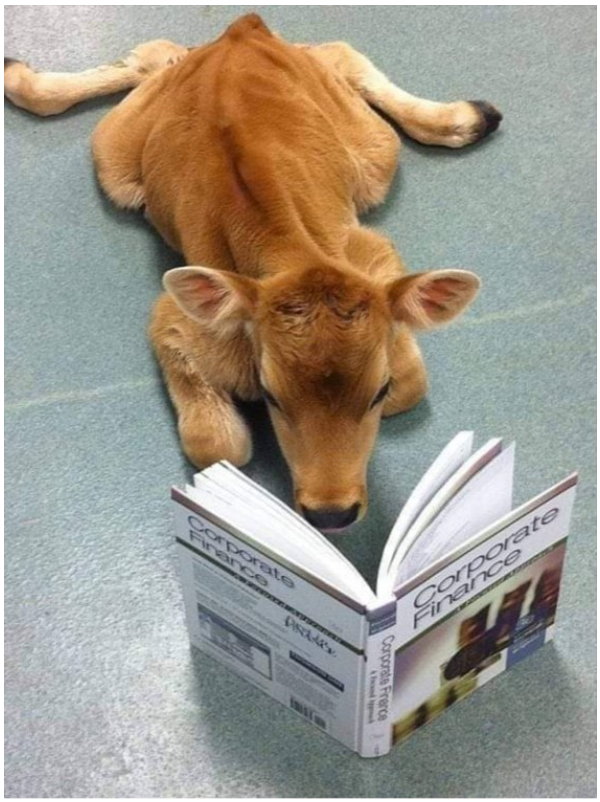
Te cuentan una historia que conmueve, te enganchan y te dan una solución. Son brillantes. Al mejor nivel de las mejores cosas que ves por la tele. Algo por lo que por supuesto pagarías por ver en una plataforma, la prueba del algodón. Prueba superada con creces. Y con la gran reflexión dolorosa, la comparación con nosotros los viejos, o también llamados investigadores seniors. Las presentaciones no es ya que sean buenas, en que son mejores que cualquiera de las nuestras. Cualquiera de cualquier científico que haya visto en un congreso internacional de prestigio. Eso es bueno, muy bueno. Significa lo que significa. **Que hay una generación que viene detrás de nosotros que más que empujar fuerte está arrasando. Que sois mejores que nosotros, que es lo que tiene que ser.**

Este es a mi juicio el mayor tesoro que puede tener un país, por eso estoy absolutamente orgulloso de vosotros. Y por eso nuestra es la responsabilidad de apoyaros hasta el final, que es donde viene el problema. Que me fijo en vosotros y miro el otro extremo de la cadena y me pongo a llorar. **No es posible que este enorme talento se desperdicie por falta de medios**. Por poner un ejemplo, seguimos valorando las vacunas frente al COVID cuando tenemos en España al mejor experto, desarrollador de las dos vacunas previas en el 2002 y 2012 para los SARS I y II (la famosa Gripe Aviar va en el cajón), con un mísero presupuesto de cuatro millones de euros, que hace que la mejor vacuna no haya estado a punto a tiempo. Y no es culpa de él, que trabaja después de jubilado por amor al arte; bastante tiene con buscar fondos para su equipo. Es que compite con monstruos que dedican miles de millones. Pero es que somos mejores que ellos, y eso es lo que duele. **Que no tengamos algo más de recursos. Posiciones estables, tranquilidad, algo de tranquilidad. Conciliación de la vida laboral y familiar. O por lo menos respeto y algo de consideración por la sociedad,** que os aseguro que esto es un sacerdocio, algo vocacional de gente muy especial. De gente que no se rinde. Que cuando se marcha de España, os lo aseguro, es porque ya no puede más con su hambre. Y se marchan reclamados a los mejores sitios, pero con la cara mirando a este país y los ojos llenos de lágrimas.

EXPERIENCIA EN EL SYMPOSIUM

Nuestro mejor futuro

Todos tenemos una responsabilidad. Vosotros la de no cambiar nunca, la de nunca rendiros. Nosotros la de exigir que vuestro futuro sea justo, con medios justos. Tanto en lo económico como en lo administrativo y social. A nuestra generación nos toca en el ámbito científico exigir y pasar miserias para que vosotros os podáis ubicar en el lugar que os corresponde. Del mismo modo que nuestros abuelos nos colocaron del tercer al primer mundo hace poco. Y os aseguro que es difícil, pero quiero pensar que tenemos que reclamar a punta de navaja si hace falta lo que consideramos imprescindible para vuestro futuro. A quien corresponda y de la forma que sea, porque ya no podemos desperdiciar una generación más. Debemos reclamar la importancia de lo que es la ciencia para salvar el futuro. **Y si eso implica menos fútbol o menos dinero para estupideces, a lo mejor tenemos de enfrentarnos al mismísimo demonio**. Habrá que hacerlo, nuestros abuelos así lo hicieron y vosotros os lo merecéis.



En el próximo número de Molécula...

El próximo número de MOLÉCULA incluirá las actividades que tengan lugar durante el mes de Septiembre, así como publicaciones de grupos de investigación de la facultad, noticias interesantes y curiosidades. Mientras tanto, os deseamos un feliz verano ¡cuidaos mucho!

¡FELICES VACACIONES!

#DivulgaUCLM

https://moleculauclm.wordpress.com/