ainia
learning

MEET THE LATEST ADVANCES IN BIOTECH & SUPERCRITICAL CO2 TECHNOLOGIES

Fecha de inicio: **18 noviembre 2021**
Fecha de fin: **19 noviembre 2021**
Duración: **2 horas**
Horarios: **10:00-11:00 GMT (11:00-12:00 hora española)**
Ubicación: **VALENCIA**
Modalidad: **Online**

Precio: **0€**

Introducción

Nowadays, it is essential to be updated with the latest techniques and technologies, to satisfy fast, efficiently, and sustainably the market needs. Innovation is gaining great importance to develop new products and to improve the actual procedures and studies, especially in sectors such as chemicals, agriculture, alimentation, cosmetics, nutraceuticals, and pharma.

This 2-day webinar, developed by AINIA experts in I+D, will consist in 3 lectures about the latest technologies in bioprocesses, *in vitro* models for novel and bioactive ingredients; as well as supercritical CO2 extraction, paying special attention to their different application in these sectors.

If you register in this webinar, you will receive a link and instructions to access online to the event.

Objetivos

- To describe the potential of different techniques in Industrial Biotechnology for pharma, chemical, agricultural, food and cosmetic sectors
- To analyse different advanced in vitro systems as an alternative or complementary to in vivo studies, describing specific systems and their potential application for clinical or nutritional studies
- To address practical information about the technology of extraction with supercritical CO2 and its potential to obtain high-quality extracts or to remove undesirable substances in diverse applications linked to products for humans, such as

foods, nutraceuticals, cosmetics, etc.

Dirigido a

- Professionals in the sectors of Biotechnology, Pharma, Chemicals, Cosmetics, Nutraceuticals and Food
- Professionals in Development of Products, R&D, Production, Procurement, Quality, Regulation and Marketing
- Professionals responsible for laboratories and clinics
- General public interested on the topics described

Metodología

Webinar consisting in 3 lectures that will focus on a theorical-practice point of view of the topics, focusing on specific techniques and processes, and their potential exploitation in different sectors. These lectures, given by experienced specialists from AINIA, will also allow a space for questions and enquires made by the participants of the Webinar.

Day 1: Advanced biosynthesis and in vitro evaluation of novel bioactive ingredients:

- Introduction
- Advanced bioprocesses for novel and bioactive ingredients. Ana Torrejón, specialist in industrial biotechnology
- Advanced in vitro methods for preclinical studies. Lidia Tomás, specialist in preclinical in vitro studies
- Questions

Day 2: Supercritical CO2 extraction for food, hemp, cosmetics, and cork:

- Introduction
- Supercritical CO2 extraction for food, hemp, cosmetics, and cork. Elvira Casas, specialist in Supercritical Fluid Technologies-Altex
- Questions

Programa

18th November 2021, 10:00-11:00 GMT (11:00-12:00 España)

Advanced biosynthesis and *in vitro* evaluation of novel bioactive

ingredients.

1.Advanced bioprocesses for novel and bioactive ingredients. Ana Torrejón, specialist in industrial biotechnology

Industrial Biotechnology combines set of techniques that use enzymes and microorganisms to obtain products for the chemical, agricultural, human food, animal feed, cosmetic and pharma sectors. This session will give an overview of advanced bioprocesses for the biosynthesis of novel and bioactive ingredients, focussing on the design, optimization and implementation of these processes and combining the know-how of the different disciplines involved: microbiology biotechnology process engineering and design of equipment. Some of the bioprocesses covered in this session may be classified as follow:

- Bioproduction: Production of microorganisms with specific functionality: Probiotics
- Biosynthesis: Synthesis of high added value molecules using microbial platforms: Novel recombinant proteins and compounds
- Biocatalysts: Biological transformations using biological catalysts: Bioactive Peptides.

2. Advanced *in vitro* methods for preclinical studies. Lidia Tomás, specialist in preclinical *in vitro* studies

This session is about different advanced *in vitro* systems as an alternative or complementary to *in vivo* studies. Those are improved methods, with enhanced representativity, that allow to reduce the number of final candidates to test in animal models and therefore, reducing the required animal testing, as well as to increase the success of subsequent clinical studies or nutritional intervention studies.

- *In vitro* dynamic digestion systems: those can mimic both the gastrointestinal tract and the colonic fermentation (microbiome studies). The latest advances include 3D models of stomach including peristaltic movements, and clear differentiation between the three areas of the small intestine. Besides, the advanced software allows to adapt the gastrointestinal conditions regarding to pH curve, transit times, sample volumes and simulated gastrointestinal

secretions to the specific characteristic of the sample. The advances in omics techniques such as metabolomics, proteomics and metagenomics bring an increased added value to the studies performed with these systems. An application of this system to study the solubilization and intestinal digestion of an active principle will be presented.

- Organ-on-chip: those systems incorporate the microfluidics to the studies with cell models, thus allowing to simulate the dynamic environment in which cells are located, being more comparable to in vivo conditions than static culture. An application of this system simulating a gut-on-chip to study the intestinal absorption will be discussed.
- 3D bioprinting: increased accuracy in the simulation of a complex tissue and organ, being one of major innovations in regenerative medicine. Interactions between different types of cells, skin penetration studies, analysis of the role of the cell scaffolds, are examples of studies that are possible with the application of this technique. The developing 3D adipose tissue model for obesity research and evaluate or discovery compounds/bioactive to prevention will be discussed.

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3. Supercritical CO_2 extraction for food, hemp, cosmetics and cork. Elvira Casas, specialist in Supercritical Fluid Technologies-Altex

Processes with supercritical CO_2 and especially, extractive ones, are feasible up to industrial scale to made high quality product without involving organic solvents and preserving thermolabile features, in accordance to AINIA´s experience along more than 25 years in this field and up to industrial scale in Altex facility. Supercritical extractions with CO_2 may be applied for different purposes, such as obtaining fine oils and high-quality extracts up or purifying matrixes by taking out undesirable substances. Some examples could be: extraction of vegetal oils and natural extracts useful for products such as fragrances, food products, nutraceuticals, cosmetics…; obtention of low-fat proteins (especially plant-based); treatment of diverse materials to remove solvent traces, pesticides, unpleasant aromatic compounds; etc. Among other cases, the potential application to hemp to produce extracts and to cork to remove TCA will be addressed.