Spring 2021 newsletter

This is the shorter public version. All articles with * are only in the full Newsletter available on the members' only website.

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About EPSO

EPSO offers to contribute to developing and implementing the Biodiversity Partnership

EPSO welcomes the Biodiversity draft Strategic Research and Innovation Agenda (SRIA) and offers to collaborate with the Member States, the European Commission, and stakeholders to implement it.

We particularly welcome and strongly support the ambition of the upcoming Biodiversity Partnership that 'Research and Innovation in the biodiversity domain will recognize that ecological, social and technological changes go hand in hand and co-evolve, and to focus on this alignment and breakdown of silos.'

EPSO appreciates that the draft SRIA links environmental sustainability, food and nutritional security, and human health. EPSO urges application of this approach across the SRIA as a whole.

As part of the 'Need for transformative change', the Draft SRIA points out that: "Reversal of biodiversity loss is only possible with urgent transformative change that tackles the root causes of biodiversity and linked challenges including climate change, urbanization, food and fibre production, and health…." To this end, EPSO suggests considering the paper by Leclere et al. (2020), which shows through modelling that ambitious conservation efforts (protected nature reserves, restore degraded land, landscape-level conservation planning), combined with food-system transformations (boosting agricultural yields, globalize food trade, reducing food waste, globally adopt healthy diets by halving meat consumption), are central to an effective post-2020 biodiversity strategy. This strategy could avoid two-thirds of biodiversity loss as well as adverse outcomes for food affordability.

EPSO suggests including the concept of "diverse crops for diverse diets and human health and resilient production", because increasing biodiversity on cultivated land will benefit not only the environment, but also at the same time nutritional security and human health. This can be achieved by improving under-utilised and often already nutritious crops (species and varieties) to make them more resilient and economic for farmers to cultivate; their nutritional quality for humans can be enhanced further as well.

Similarly, EPSO suggests "combined approaches on crop improvement, crop management and crop processing" to enable interdisciplinary and cross-sectorial approaches with co-benefits in Europe and beyond, and to bring the various scientists, breeders, farmers, and processors together for a comprehensive approach from the start in order to achieve a better impact than adding up separate solutions at the end. Crops will have been improved to be more resilient and tolerant to biotic and abiotic stresses and to use less plant protection and fertilisation products, while ensuring healthy plants, a harvest of high quantity and quality, and smart processing to protect and possibly enrich beneficial compounds for human diets and health.

The partnership rightly defines the goals and should leave the pathways to reach these open – based on open and transparent approaches ranging from research to innovation, public procurement to legislation.

We are looking forward to help implement this SRIA with policy makers and stakeholders for a better Europe and world!

Links:

- Biodiversity draft SRIA, January 2021
- EPSO statement on the Draft SRIA, 29.1.2021 www.epsoweb.org
- Leclere D. et al. (2020) Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature 585, 551-556.

Contact: Karin Metzlaff, BE

EPSO Activities

New EPSO Plant Science Seminar Series Goes Live

On March 18th at 15:00 the European Plant Science community had the opportunity to come together virtually for a new European-wide seminar series organised by EPSO. The aim of this new initiative is to provide a stimulating set of seminars once a month on a hot and/or emerging topic in plant science, giving the floor to both eminent world leaders and talented up-and -coming early career researchers. We also hope that this monthly gathering will become a way to provide networking and communication among the EPSO membership.

Our inaugural seminar focused on the highly debated subject of genome editing in plants. While this topic has been much debated by policy makers in countries all across Europe, the jury is still out as to whether regulation will stymie its potential to deliver impact of global significance. We heard from two European leaders of the use of this approach, Prof Holger Puchta, Karlsruhe Institute of Technology and Dr René Smulders, Wageningen University who gave us insight into the development of the technology for use in plants and highlighted the potential impacts of its use for agricultural sustainability, environmental protection and human health. The seminar attracted over 280 registrants and around 140 simultaneous participants. We will follow up this successful start with a seminar in April on The Wonderful World of Plant Microbe Interactions and in May on Cutting Edge Techniques for Understanding the Hidden World of Root Development.


In the coming months we will be on the lookout for talented plant scientists among the EPSO membership to present their findings and perspectives. If you wish to nominate yourself or one of your colleagues to give a seminar, please contact Tim George to provide your name and potential talk title.

So, remember TTT: be available on the **Third Thursday** of the month at **Three** (CET) for some inspirational talks from European Plant Science.

Contact: Tim George**,** The James Hutton Institute, Dundee, UK

EPSO Workshop 'Addressing the Nutritional Security challenge is a strategic issue for Europe under COVID-19 pandemic' - 15-16.6.2021

The EPSO Nutritional Security Working Group will hold its workshop to discuss the latest (bio) technologies which can contribute to define a new roadmap focused on `How to achieve the Nutritional Security issue in Europe´. The meeting intends to increase collaborations between the working group members at both bi-and multi-lateral levels. In addition, it will provide a report including recommendations on R&I as science advice to policy to the European Commission as well as national authorities.

The workshop will be held online 15-16 June 2021 from 9 am to 1pm.

The Workshop sessions are: Introduction and update on European Commission and Member States initiatives; Re-discovering underused species and landraces of fruits, vegetables and staple crops; Use of new metabolic engineering / new breeding technologies to re-design high quality crops; Linking the concept of diverse diet, bioactive compounds & the prevention of human diseases.

See the workshop Draft Programme (02.04.2021) and the Draft Statement on Nutritional Security (9.5.2020) which will be further discussed at the workshop.

We kindly ask EPSO members to **offer a 5 min inspirational note** by providing your name, affiliation, talk title & to which session you offer this **by 30 April** for the chairs to be considered and included in the programme, and to **register for your participation** to the workshop **before 15 May**, both by e-mail to Marina Korn (korn@igzev.de).

Background**:** The access to healthy and nutritious food at reasonable prices for all the European citizens is mandatory under COVID-19 pandemic, if we want to improve human wellbeing, reduce over-loading medical / hospital capacities and promote the transition to new more sustainable food systems. This is captured in the concept of 'Diverse crops for diverse diets for human health and resilient production', promoted by EPSO.
This issue is linked to the UN Sustainable Development Goals (SDGs) 2 (zero hunger) and 3 (good health and well-being) proposed in the World Food Programme, and in the Farm to Fork and the Biodiversity strategies under the European Green Deal, foci of the Horizon Europe Programme for Research and Innovation.
Addressing these challenges is getting even more urgent, since new scenarios [global warming, overpopulation of metropolis, globalized trade systems, invasion/destruction of wildlife habitats, new emerging zoonotic diseases] will likely impact on our common behaviors and choices related to food and nutrition.

We very much look forward to your contributions and to welcoming you at the workshop.

Contacts: Monika Schreiner (IGZ / DE), Chiara Tonelli (Uni Milano / IT), Angelo Santino (CNR / IT) and Karin Metzlaff (EPSO).

Plant Biology 2021 Congress: last update

The organization of the PBE2021 Congress, originally planned to be held in Turin on behalf of EPSO and FESPB, demonstrated full resilience to Covid-19 emergency by re-starting work to finally and successfully hold the Congress as an online event from 28 June to 1 July 2021. Following the decision of the Scientific Organizing Committee, abstract submission was re-opened in October 2020, and the abstracts were evaluated in March 2021 selecting those admitted for oral presentation.

The Congress program will host 12 Plenary lectures and 23 Keynote talks by top European and world scientists involved in Plant Biology research. Keynote talks will introduce specific parallel sessions concluded by a final live discussion. We have taken advantage from the online format by promoting the best evaluated abstracts which could not find place within sessions to be presented as 10-minute Extended Elevator Pitches in a dedicated on-demand session. The Congress platform will ensure networking by Plenary ad Session discussion, and by a 1 to 1 chat system.

In addition, the two **EPSO Young Plant Scientists Awardees**, Ann-Katrin Beuel (on applied plant research) and Apolonio Huerta (on fundamental plant research) will present their work. EPSO is inviting you to the **science and policy session 'Plant Research – European Green Deal – Global Future'** discussing with you contributions of plant science to the European Green Deal and the UN Sustainable Development Goals (SDGs) and the role of the Horizon Europe Research and Innovation Programme. The European Commission and EPSO will hold the session on '**The ERC – European funding for frontier research in plant'** and the GPC and EPSO invite you to their workshop on the **Nagoya Protocol.**

The Local Organizing Committee and the PCO are working hard in order to showcase the latest advances in Plant Biology to the European and wider scientific communities. We look forward to meet you in our friendly (virtual) city for a vibrant and exciting Congress!

Contact: Andrea Schubert, University of Turin, IT

Virtual Fascination of Plants Day 2021 in May

During May 2021, National Coordinators and event organisers of several countries across the world will organise online events to get you fascinated and enthused about plants.

To find a complete list of activities available during Fascination of Plants Day, check the news section of the dedicated website. In 2022, events will be back on each dedicated country page.

You can also follow the **sporadic FoPD 2021** and events' announcements on FoPD social media: Twitter (@PlantDay18May), Facebook and Instagram (@fascinationofplantsday). Feel free toshare your pictures and experience while tagging our accounts with #FoPD #Plantsday #PlantDay.

The FoPD team is wishing you an entertaining exploration of its events.

Around 18 May 2022 will be the next **official FoPD**, hopefully then again with physical and virtual events.

Contacts: Global coordinators: Alexandra Barnoux, EPSO, BE; Trine Hvoslef-Eide, Norwegian University of Life Sciences, NO, Przemysław Wojtaszek, Adam Mickiewicz University, PL; Karin Metzlaff, EPSO, BE.

ERA-Net SusCrop activities

In February 2020, The ERA-Net Cofund on Sustainable Crop Production (SusCrop) launched a 2nd transnational call for proposals. This resulted in the selection of eight consortia for funding with a total amount of about 7,5 Mio €. More information about the funded projects that have now officially started (Spring 2021) can be found on the SusCrop website: https://www.suscrop.eu/call-information/2nd-call. A joint research projects' kick-off meeting will be held digitally in June 2021.

Early 2021, the ERA-Net SusCrop together with the ERA-Nets SusAn (Sustainable Animal Production Systems), FACCE ERA-GAS (Monitoring and Mitigation of Greenhouse Gases from Agriculture and Silviculture), ICT-AGRI-FOOD have coordinated and aligned efforts in areas of mutual interest and established a joint call in the field of agricultural greenhouse gas (GHG) research, focusing on circularity in mixed crops and livestock farming systems with emphasis on climate change mitigation and adaptation. This joint call for proposals follows a one-stage submission procedure and is open until May 26, 2021 (15:00 CEST). For more information, please visit the submission tool website: https://www.suscrop.eu/2021-joint-call.

Within the scope of the EPSO Fascination of Plants Day in May 2022, SusCrop will soon (early Summer 2021) launch a 'call for video awards'. Please stay tuned!

EPSO is official observer in SusCrop and advices on research strategies and additional activities.

Contact: Nikki De Clerq, ILVO, Research Institute for Agriculture, Fisheries and Food, BE

Members' news

Welcome to the Future Food Beacon, University of Nottingham, UK

The Future Food Beacon is an integrated open-research platform that embraces transdisciplinary research. Future Food brings together soil science, primary production (crops and livestock), nutritional science, food processing and manufacturing, supply chains and consumer preferences. We also harness the power of digital technologies.

All of our work is informed by an understanding of the economic, legal, social, cultural, historical and ethical issues that underpin and shape food systems. More details of our research and stories from our researchers can be found at our website: nottingham.ac.uk/future-food and our blog: blogs.nottingham.ac.uk/futurefood

One particular research strength is around the 'rhizosphere', exploring how plant roots interact and respond to soil and the microbiota that live there. Assoc. Prof. Gabriel Castrillo is a leader in this field, with a recent paper published in *Science*. Another growing strength is the work of Prof. Andrew Salter and the Future Proteins Platform team, who are evaluating novel plant and non-plant protein sources and developing variants most suitable for animal feeds and/ or human consumption.

We host an International Agriculture Doctoral Training Programme, run jointly with Rothamsted Research. The PhD candidates come from all over the world, including Bangladesh, Ethiopia, Ghana, India, Indonesia, Kenya, Malawi and Zimbabwe. They bring with them expertise and diverse cultural backgrounds that are invaluable to each other's projects, as well as to the Beacon as a whole.

We work closely with our colleagues at both our Malaysia and China campuses, and with a wide set of international partners in Africa, Latin America, the Caribbean and China. We also connect with international organisations such as the UN Food and Agriculture Organisation (FAO).

The Future Food Beacon is uniquely positioned to face the challenges of delivering equitable access to healthy, sustainably and economically produced food in a post-COVID-19 world.

Contact: Gabriel Castrillo

Welcome to the University of Melbourne , Australia

The University of Melbourne (UoM) was founded in 1853 and is recognised for excellence in research, teaching and learning. UoM is ranked as number 1 in Australia, and is among the leading universities internationally - number 31 (THE) and number 35 (ARWU). Comprised of ten separate faculties, UoM's disciplinary breadth spans medicine and health sciences, engineering and information technology, science, arts and humanities, architecture, business and economics, and education. Some of our world class multi-disciplinary research facilities include the System Garden, the Glasshouse Complex, the Herbarium, and the Advanced Microscopy Unit within the Bio21 Molecular Science and Biotechnology Institute. Over 8000 academic and professional staff support a diverse student body of more than 54,000 undergraduate and graduate students of which 44% are international students representing over 130 countries.

UoM promotes a culture of research excellence and impact of international standing. Our research seeks to address major economic, health and environmental challenges of the present and the future such as quantum computing, vaccine development and climate change. Our plant science research is broad, including marine and plant ecology, genetics, plant systematics and taxonomy, evolution and evolutionary biology, plant cell wall biosynthesis, metabolism and physiology, genetic modification, climate change, and environment adaptation. We seek to discover how plant systems function and to solving the ongoing challenge of maintaining food, health, land and water for society and the planet's natural and agro-ecosystems.

To enable us to more competitively tackle these scientific questions, we have developed significant global research partnerships, initiatives, and academic relationships, with some of the most critical being those with institutions and research centres in Germany such as the Max Plank Institute for Plant Physiology and the Forschungszentrum Jülich, alongside university partners such as the University of Bonn and RWTH Aachen. These partnerships are driven by co-supervision of talented graduate research students who enrich our scientific community with their passion for modern plant research.

Contacts Michelle Watt & Ute Roessner
https://biosciences.unimelb.edu.au/about-us/plant-science

CHIC– progress on chicory for dietary fiber and medicinal terpenes

During the first three years of the CHIC project, three methods out of four with varying degree of DNA invasiveness have been implemented for the delivery of CRISPR tools to chicory cells (with identical genetic outcomes). The genes for self-incompatibility in chicory was found, and solutions to bypass their action are currently tested. Additionally, a current guide RNA has been used to generate chicory plants which allowed for conceptional different NPBTs. Additionally, off-targets for the common guide RNA have been assessed and tested in first screens.

Inulin and latex of chicory are of interest. This las one contains large amounts of sesquiterpene lactones and bioactivity assays identified one promising sesquiterpene lactone with anti-inflammatory activity and extracts containing antimicrobial activity. Candidate genes, using transcriptome data and the newly sequenced genome, have been identified and are being functionally characterized. The project continues to identify biological activities of interest for these sesquiterpene lactones and to increase their production by using New Plant Breeding Technologies (NPBTs).

The partners further evaluate whether CRISPR edited chicory is regulated as GMO or not. Moreover, the impact of different NPBTs on economic and social indicators will be further quantified.
Two business cases for NPBT chicory are advancing based on dietary fibre and bioactive terpenes. Improved inulin and terpene fractions are subjected to in vitro bioactivity and safety evaluation and business cases for both lines will be created. A physiologically relevant model of the inflamed intestinal mucosa was developed for studying anti-inflammatory effects of chicory terpenes. Chicory extracts were assessed, and a new multi-ingredient process was investigated. A conceptual design yielded the sales price for the terpene mixture to be in line with specialty ingredient prices with an outlet in food supplements.

EPSO is engaging the Stakeholder Advisory Group for better project outcome and impact and supports outreach with videos and social media n CHIC.

Art work educational activities for “early-state researchers” and a CHIC game are being developed using virtual, augmented reality and ICT technology to educate teenagers about the CHIC concepts.

Contacts: Macarena Sanz, ID Consortium, ES; Dirk Bosch, Wageningen University , NL, (Coordinator)

TOMRES - water and nutrient use efficiency—final meeting in April

The TOMRES project (“A novel and integrated approach to increase multiple and combined stress tolerance in plants using tomato as a model“) is reaching its completion in May 2021, and a comprehensive summary overview of the scientific and technical conclusions achieved will be published in the project Final Report. TOMRES innovative solutions developed throughout the project to enhance resilience to combined water and nutrient stress in tomato have been validated by on-farm testing and demonstration.

Innovations developed by TOMRES include biostimulants, organic fertilizers and Variable Rate Technology (VRT) to help farmers in the transition towards a more sustainable agriculture to reduce dependency on pesticides and antimicrobials, excess fertilisation, to increase organic farming, and reverse biodiversity loss. These innovations are going to be ready for market-uptake either in short or medium term.

EPSO engaged the Stakeholder Group and produced videos and social media activities in TOMRES.

Visit the TOMRES website to read the newsletters, practice abstracts (in multiple languages) and technical and scientific publications (www.tomres.eu).

Contacts: Alberta Bertin, Novareckon, IT; Andrea Schubert, Turin University, IT (Coordinator)

CropBooster-P- Towards the development of a roadmap for the European Commission

In the first year of the CropBooster-P project, scientific and technological options were identified to improve sustainability, yield (addressing abiotic stress) and quality of our crop plants. Also, 4 contrasting scenarios were developed each depicting a different future in which these crops would have to be grown.

In the previous year, these options and scenarios where discussed both with professional stakeholders and with consumers, a.k.a “the man in the street”. These discussions were held in a series of on-line workshops with European farmers, breeding industry, consumer organizations and other professional stakeholders. In addition, similar on-line workshops were held throughout Europe to capture the opinion of consumers and other interested laymen.
The outcomes and results of these workshops will aid the development of a roadmap for the European Commission not only advising on the scientific directions to take to future proof our crops, but also on how to implement these improved crops into society.
More information on these topics and on the CropBooster-P project itself can be found at www.cropbooster-p.eu

Contact: Rene Klein Lankhorst, Wageningen University, NL

InnCoCells - Innovative high-value cosmetic products from plants and plant cells (2021-2025), a new EU H2020 project

The *InnCoCells* Consortium brings together partners from 11 European countries, and comprises eight SMEs, one large industrial company, six academic partners and two non-profit associations. This industry-driven project will increase the capacity of European biotechnology to meet societal needs. The academic partners have been chosen to complement the industrial expertise.

The main goal of the project is to develop innovative and sustainable plant-based production processes for the commercial exploitation of scientifically validated cosmetic ingredients based on underutilised plant resources. We will optimise these resources for profitable and sustainable production using cell cultures, aeroponics and greenhouse/field cultivation. We will apply systematic approaches including metabolic engineering tools to optimise growth

The optimised processes will be demonstrated by pilot-scale production and subsequent product extraction/ purification. We will bring at least ten cosmetic ingredients to the precommercial stage. InnCoCells includes a cascade biorefinery concept in which by-products and biowaste are utilised for the extraction of further bioactive molecules. The processes will be characterised by techno-economic assessment and life cycle analysis to ensure economic feasibility and a reduced environmental footprint. The ingredients and extracts will be evaluated using a unique panel of innovative enzyme-based and cellbased assays to ensure safety and validate claimed activities based on robust scientific data without animal testing.

We will implement a unique stakeholder engagement strategy, including the assembly of a Stakeholder Group to guide our research program based on the needs of industry, academia, farmers, policymakers and consumers. We will develop bespoke communications strategies for different stakeholders and for public engagement. We will also interact closely with the cosmetics regulatory authorities in Europe. This industry-driven and interdisciplinary project will ultimately increase the strength of the European bioeconomy by supporting the development of innovative biobased goods and markets.

EPSO will develop and engage a Stakeholder Group in InnCoCells, including SHG sessions at the annual project meetings. Furthermore, EPSO supports outreach with the production of videos on InnCoCells and social media activities.

Consortium partners: VTT (Finland), LIST (Luxemburg), VIB (Belgium), EVILVO (Belgium), ENEA (Italy), TUDA (Germany), EPSO (Belgium), MERCK (Germany), Add Essence (Belgium), Arterra Bioscience (Italy), Plant Advanced Technologies (France), Alternative Plants (Latvia), Evologic technologies (Austria), Ecomaat (Bulgaria), ScandiDerma (Norway), Twyman Research Management (UK) and Cosmetic Valley Association (France)
EU funding: 7.9 M€ (4 years); the project is expected to start May 1st, 2021

Contact: Kirsi-Marja Oksman-Caldentey (coordinator), VTT, FI

EPSO General Meeting
1 - 2 July 2021

Contact: Karin Metzlaff

PBE Conference
28 June - 1July 2021
Turin
Contact: Andrea Schubert

FoPD 2021 sporadic online events around 18.05.2021, worlwide
Contact: EPSO

EPSO, the European Plant Science Organisation, is an independent academic international non-profit organisation that represents over 200 leading academic research institutes, universities and departments from 31 countries. Together they represent over 26 000 plant researchers and staff. In addition, EPSO has over 3000 personal members.

The mission of EPSO is to promote plant science and plant scientists, to represent plant scientists in discussions about future plant science programme priorities across Europe, to provide an authoritative source of independent information on plant science (science advice to policy), and to promote training of plant scientists to meet 21st Century challenges in breeding, agriculture, horticulture, forestry, plant ecology and sectors related to plant science.

To achieve its mission, EPSO advises policy and decision makers at European and national level on science policy, as an independent body and as member of the Initiative for Science in Europe (ISE) and the European Technology Platform 'Plants for the Future' (Plant ETP). EPSO supports plant scientists via the EPSO working group meetings, conference, workshops, internships and as information broker via EPSO briefings, newsletter and its website.

EPSO's strategy is defined by the representatives at the General Meeting and further elaborated by the elected Board. Current Board members are Alan Schulman (President – IT), Ulrich Schurr (Vice-President – DE), Isabelle Litrico (FR), Ernst van den Ende (NL), Antonio Leyva (ES), Przemysław Wojtaszek (PL), Josef Gloessl (AT), Angelo Santino (IT), Odd Arne Rognli (NO) and Tim George (UK).

EPSO's strategy is implemented by its members and staff. **EPSO staff** profiles are available here.
Contact us to join our activities:

- Science policy (EPSO, ISE, Plant ETP), Science Support (working groups, projects), members, observers, association relations: **Karin Metzlaff**
- Website, social media, briefings, newsletter, communications: **Alexandra Barnoux**
- Office, accounts, projects, meetings, database, personal membership administration: **Sofia Ciravegna**

Since its creation in 2000, the organisation has become a strong advocate of plant research in Europe and an important voice articulating the contributions and needs of plant scientists at national and European levels and beyond. One of EPSO's priorities is science advice to policy.

***EPSO News* is written by:**

Alexandra Barnoux, Publications Officer

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European Plant Science Organisation, Rue de l'Industrie 4, 1000 Brussels, Belgium. Tel/Fax: +32 (0)2 213 62 62. epso@epsomail.org