



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



**FOOD, BIOECONOMY,
NATURAL RESOURCES,
AGRICULTURE AND
ENVIRONMENT**
Research Overview

2023

Circular Bio-based Europe

Joint Undertaking

UNIBO AT A GLANCE

Founded in 1088, UNIBO is recognized as the oldest university of the Western world. Nowadays, UNIBO is the second largest university in Italy and one of the most important institutions of higher education across Europe.

UNIBO in numbers:

5 operating sites and a permanent headquarter in Buenos Aires

32 Departments

5 Schools

12 Research and Training Centres

90.291 students (among which 7,062 are international students)

5.882 permanent staff

2nd Italian university in QS World University Rankings 2022

1st Italian university in World University Rankings 2022

37th Top university in the world for global impact in Times Higher Education University Impact Ranking 2022 based on UN SDGs

12th most green university worldwide (1st in Italy) in UI Greenmetric 2021

1st Best Universities in Italy in U.S. News & World Report Best Global Universities Ranking 2022

Research and Innovation is a priority of the University's mission.

UNIBO is very active both at National and European level in all research areas in attractive funding for research and innovation. Activities related to competitive funding programmes are supported by the UNIBO **Research Division**, with over 10 years of experience and about 50 people assisting research groups throughout the project lifecycle. The [Research Development Office](#) deals with the pre-award phase and UNIBO's strategic positioning at local, national and international level, through integrated networking and lobbying activities in every research area. The **Programmes & Projects Office** supports UNIBO researchers from the projects' implementation phase with technical, legal, financial and administrative expertise. These offices strictly cooperate among each other and work in direct connection with the **Knowledge Transfer Office**, which is responsible for the Innovation Management, the IP protection and exploitation, and the take up and commercialisation of the project results.

UNIBO has considerable experience in International and European research projects and successfully participated in **274 projects** funded under FP7 in 2007-2013 (**58 as coordinator**) and received a total of **87,8 M€** in funding. Moreover, UNIBO participates in **2 Mission Soil proposals** and **1 Mission Oceans proposal**, with a total **EU contribution of almost 1,2 M€**.

In **Horizon 2020**, UNIBO is involved in **352 funded projects (98 as coordinator)** with more than **149 M€** of funding. UNIBO is also a partner of the EIT Knowledge & Innovation Communities and many of the most important EU initiatives related to Horizon 2020 (ETPs, EIPs, JPIs, etc.). In the bioeconomy sectors, UNIBO participates in 51 projects, (9 as coordinator), with a total EU contribution of 23,6M €, addressing many EU priorities under Horizon 2020 [Societal Challenges 2 and 5](#).

So far, in the framework of **Horizon Europe**, UNIBO participates in **26 Cluster 6 proposals**, with a total **EU contribution of more than 11,6 M€**. UNIBO is a founding member of the [European Bioeconomy University \(EBU\)](#), an alliance of the six leading European universities most active in the bioeconomy sector. EBU was founded in 2019 together with 5 other leading universities: Wageningen University, University of Hohenheim, AgroParisTech, Vienna University of Natural Resources and Life Sciences (BOKU) and University of Eastern Finland.

UNIBO pays special attention to Blue Growth and the Mediterranean region by participating in the Partnership for Research and Innovation in the Med Area ([PRIMA](#)). We are also involved in the [BLUEMED](#) initiative, [WESTMED](#) initiative, and we coordinate the Thematic Steering Group on Blue Growth in the **EU STRATEGY FOR THE ADRIATIC-IONIAN REGION** ([EUSAIR](#)) initiative.

UNIBO has also contributed to the implementation of the [EU FOOD 2030 Strategy](#) as partner in the [FIT4FOOD2030](#) project.

UNIBO is a gold core member of [EIT Food](#), affiliate member in the [Climate-KIC](#) and core member of the [EIT Raw Materials initiative](#).

At **national level**, UNIBO is on the Board of Directors of the National Technological Cluster on Agrifood ([CLAN](#)), the National Technological Cluster on Green Chemistry ([SPRING](#)) and the Blue Italian Growth National Technological Cluster ([BIG](#)).

HORIZON EUROPE PROJECTS IN WHICH UNIBO IS PARTNER

FARM TO FORK

CONSERWA – Evidence-based support for transition to agroecological weed management in diverse farming systems and European regions

CONSERWA aims to address the aforementioned challenges by: a) compiling a portfolio of agroecological farming practices, studying their optimal combinations & transferability, including suitability under CC scenarios, b) supporting the implementation of these combinations and the measurement of their performance & impacts using novel tools, c) supporting knowledge management & communication between stakeholders with the ultimate goal of practical decision-making and impact assessment through an open DSS, d) studying factors influencing farmers' decision-making in applying agroecological farming, working together with the value chain, such as the food processors & consultancy services.

CHORIZO – Changing practices and Habits through Open, Responsible, and social Innovation towards ZerO food waste

CHORIZO aims to improve the understanding of how social norms influence behaviour and FLW generation and use this knowledge to increase the effectiveness of decision-making and engagement of food chain actors, in changing social norms towards zero food waste. To achieve its aim, the project will: (i) translate outputs from previous FLW actions into evidence; (ii) generate new evidence on social norms & FLW behaviours; (iii) utilise advanced modelling techniques to produce solutions that integrate behavioural and economic theories; (iv) embed research results into innovation products that can foster change of FLW-related social norms.

ENFASYS – ENCouraging Farmers towards sustainable farming SYstems through policy and business Strategies

ENFASYS aims to stimulate a just and robust transition to sustainable, productive, climate-neutral, biodiversity friendly and resilient farming systems (SFS) by improved policies and business strategies that encourage farmers to change their production systems. In current food systems, farmers are challenged by multiple lock-ins that prevent them to move to SFS. To overcome this and thus to support the Green Deal and in particular the Farm to Fork ambitions, strengthening public strategies (policies) should go hand in hand with strengthening private strategies (business models, social innovations). To reach this aim, ENFASYS goals are (1) an improved understanding of lock-ins and levers in farming and food systems; (2) an improved understanding of behavioural factors of farmers, consumers and other food chain actors; (3) more and better evidence on the potential effectiveness of interventions; (4) a more structured approach to link knowledge to action.

FOODCoST – FOOD Costing and Internalisation of Externalities for System Transition

FOODCoST aims to respond to this challenge by designing a roadmap for effective and sustainable strategies to assess and internalise food externalities; and to provide approaches and databases to measure and value positive and negative externalities, proposing a game-

changing and harmonised approach to calculate the value of climate, biodiversity, environmental, social and health externalities along the food value chain based on economic cost principles.

FishEUTrust – European integration of new technologies and social-economic solutions for increasing consumer trust and engagement in seafood products

FishEUTrust represents a consortium of 22 organizations from 14 countries, pooling their expertise to defragment the current food system to ensure sustainability and deliver solutions for a transparent and traceable seafood supply chain necessary to promote high-end, pan-European farmed seafood. The innovation at the heart of FishEUTrust is integrating different actors into a digital platform that links technology providers, supply chain stakeholders, regulatory/policymakers and consumers. FishEUTrust aims to establish 5 Co-creation Living Labs (CLLs) in diverse environments: the Mediterranean Basin, the North Sea and the Atlantic Sea.

PATAFEST - Potato crop effective management strategies to tackle future pest threats

PataFEST aims to characterise at molecular level the ecological pest spread pathway and identify potato disease resistance varieties against CLso and postharvest pathogens; to provide effective preharvest plant and soil treatments against CLso vector and soil-borne pathogens combined with other cutting-edge digital technologies such as image analysis tools (mobile app) and artificial intelligence predictive models; to develop postharvest technologies (biocontrol coating solution, controlled atmosphere storage and volatile organic compounds (VOCs) sensors) to control the incidence of soil pathogens and maintain the quality of potato tubers stored.

PLANEAT – Food systems transformation towards healthy and sustainable dietary behaviour

PLAN'EAT aims to advance the scientific basis on factors influencing dietary behaviour and the health, environmental and socio-economic impacts of dietary patterns and deliver solutions for transition through a transdisciplinary and multi-level approach. PLAN'EAT aims to co-create data and interventions in pan-EU network of 9 Living Labs and a Policy Lab. These living labs will focus on a broad range of population groups, varying according to age, culture, health and socio-economic status.

ZERO POLLUTION

StopUP – Protecting the aquatic environment from urban runoff pollution

StopUP aims to elucidate pollution pathways in urban catchments to enable targeted interventions through measures at source, retention and treatment. It will foster knowledge about emissions incl. pollutant release, transport and receiving water bodies through advanced monitoring concepts, online sensors and data processing and analysis. In the context of different case studies, innovative technologies for pollution prevention such as advanced retention soil filters for combined sewer overflow treatment which can be integrated better in urban areas will be further developed and tested.

SYMBIOREM – Symbiotic, circular bioremediation systems and biotechnology solutions for improved environmental, economic and social sustainability in pollution control

SYMBIOREM aims to improve the effectiveness, sustainability, circularity and cost-efficiency of bioremediation and revitalisation strategies for soils, sediments, surface water and groundwater. SYMBIOREM focuses on the intersection of advanced bioremediation methods with circular bio-based systems. 12 novel bio-based technologies and strategies are developed as modular solutions to mutually enhance bioremediation efficiency, use secondary inputs, and turn residues and contaminants into valuable resources. SYMBIOREM aims to investigate the exploitation potential of indigenous species with bioremediation capabilities, including microorganisms, microbiomes, proteins, plants and animals.

CLIMATE

Re-Livestock – Facilitating Innovations for Resilient Livestock Farming Systems

Re-Livestock aims to evaluate and mobilize the adoption of innovative practices applied cross-scale (animal, herd, farm, sector and region) to reduce GHG emissions from livestock farming systems and increase their capacity to dealing with potential climate change impacts. To reach this aim, Re-Livestock has brought together scientific expertise in Europe and Australia and across disciplines, including co-innovation, animal feeding, breeding, welfare, farm management, environmental and socio-economic assessment and policy analysis, to develop novel and scientifically supported integrated approaches specific for different dairy, beef and pig systems and geographic regions in the context of climate change. Strong collaboration with industry stakeholders to identify the innovations and to co-design the validation will ensure relevance and maximise the adoption of best practices.

CIRCULAR BIOECONOMY

R3PACK – Reduce, Reuse, Rethink PACKaging: towards novel fiber-based packaging and reuse schemes uptake

R3PACK aims to contribute to Reduce, Reuse, Rethink PACKaging by securing fast and extensive uptake of industrially relevant, cross-sectorial, cost-effective innovative technologies allowing immediate substitution of complex multilayer plastic packaging with high performing fiber-based packaging and economical, industrial and environmental optimisation of reuse schemes demonstrated at large scale and transnationally in 3 EU countries by 2 major retailers, covering the needs of 13 different food product types. R3PACK, moreover, aims to offer a clear pathway towards a normalized framework for reusable packaging's food safety and for reusable packaging's washing methods that will serve as reference at EU level.

COMMUNITIES

GREENME – Advancing GReenCare in Europe: an integrated multi-scalar approach for the Expansion of Nature-based therapies to improve Mental health Equity

GreenME aims to identify ways in which effective nature-based therapy and a broader green care framework can be scaled-up to improve adult mental health and wellbeing equity while contributing to multiple socio-ecological co-benefits. To that end, over 4 years, GreenME's approach is to diagnose, to increase scientific evidence on the mental health and wellbeing benefits of green care and to empower green care actors to, finally, increase the use of nature-based therapy and its integration within a multi-scalar green care framework to ultimately promote just climate resilient and sustainable healthy communities.

GOVERNANCE

[BioGov.net - Mobilizing European Communities of Practice in bio-based systems for better governance and skills development networks in bioeconomy](#)

BioGov.net engages 10 experienced partners to mobilize local resources and stakeholders in 8 EU states (Estonia, Italy, Netherlands, Greece, Slovakia, Czech Republic, Portugal and Germany). The project aims to strategically support the establishment of innovative governance models in the bioeconomy sector to achieve better-informed decision-making processes, social engagement of all actors and uptake of sustainable bioeconomy sector innovations.

HORIZON EUROPE CLUSTER 6 PROJECTS COORDINATED BY UNIBO

ZEROPOLLUTION

[NYMPHE – New system-driven bioremediation of polluted habitats and environment](#)

NYMPHE aims to develop bioremediation/revitalization strategies based on the assembly of systems of available and new biologics (enzymes, microorganisms, bivalves and earthworms, plants and their holobiont) developed and applied on matrices from different EU contaminated sites: groundwater, sediments (hyporheic zone), wastewater as well as industrial, and agricultural soils.

CIRCULAR BIOECONOMY

[CARINA – CARinata and CamelINA to boost the sustainable diversification in EU farming systems](#)

CARINA is built on a multi-actor consortium and participative decision-making process through mutual learning, transparent communication, and inclusive multi-perspectives and transdisciplinary engagement. From the proposal clearly emerges the importance of social innovation as the nerve center for the evolution of the whole project. Nine Lighthouses, 5 Living Labs, and 9 Policy Innovation Labs will be established across Europe playing a leading role in the co-creation of CARINA innovation actions.

COMMUNITIES

[RURACTIVE – Empowering rural communities to act for change](#)

RURACTIVE aims to foster a just and sustainable transition of rural areas by developing smart, community-led, tailor-made, place-based and inclusive solutions within local Multi-Actor Rural Innovation Ecosystems (RIEs) in 12 pilot area (Dynamos - Ds) in 7 EU, 2 Associated Countries and Switzerland. RURACTIVE will unlock the innovation potential of rural communities by addressing six integrated Rural Development Drivers (RDDs) – namely multimodal mobility, energy transition, agri-food and agroecology, culture and cultural innovation, health and wellbeing, nature-based and cultural tourism – and transversally integrating climate change mitigation and adaption, biodiversity and social justice and inclusion.

ON-GOING HORIZON 2020 PROJECTS COORDINATED BY UNIBO

Bio-Based Industries (BBI)

BIObec – Preparing the creation of Bio-Based Education Centres to meet industry needs and boost the contribution of the bioeconomy to societal challenges



1 September 2020 - 29 February 2024

The EU-funded BIObec project will develop a comprehensive and flexible framework consisting of multi-level Bio-Based Education Centres to address the present and future needs of the industry and the surrounding ecosystem at local, regional, national and international levels. The project will design six pilots covering a wide geographical area in Europe related to the different topics associated with various value chains and institutional contexts. BIObec will identify the diverse regional needs and deliver tailored design, financial assessment and government plans for educational training centres and lifelong learning programmes.

SC 2 – Sustainable Food Security

FOODLAND – FOOD and Local, Agricultural, and Nutritional Diversity

1 September 2020 - 31 August 2024



FOODLAND adopts interdisciplinary research methods to enhance the diversity of food production and consumption in six African countries. The project creates a network of 14 local Food Hubs - paired with 14 separate cities - to mobilise relevant actors in urban and peri-urban communities and serve as injection points for introducing innovations. By bridging food production with consumption, the project reinforces the productivity and resilience of food supply chains and create new market opportunities at both the local and global scales. Benefiting both African and European consumers, the project aims to provide them with traditional-based, healthy, nutritious foods, while encouraging the diffusion of African diets and aiding the fight against malnutrition, particularly in women and children.

FOOD-E – Food Systems in European Cities



1 February 2020 - 31 January 2024

The aim of Food-E is to accelerate the growth of citizen-led City/Region food systems (CRFS) by bringing local initiatives across Europe together, as well as co-developing and disseminating a range of tools - co-designed with academia, citizens, and food system start-ups - to ensure that the most up-to-date cross-sectorial knowledge is applied. Start-ups also provide an in-depth understanding of the needs of the key stakeholders, making resilient citizen-driven food systems happen. The key challenge is then to aggregate the most sustainable models of CRFS and enable co-creation of innovative pilot experiences, fostering the health and wellbeing of European citizens.

CIRCLES – Controlling micRobiomes CircuLations for bETter food Systems



1 November 2018 - 31 October 2023

CIRCLES aims to discover and translate innovative microbiomes-tailored circular actions into concrete applications that will ultimately enhance EU food system performances and their overall sustainability. The setup of real-world labs in the field of 6 food systems relevant to the EU market – tomatoes, spinach, poultry, pigs, Atlantic salmon and seabream aquacultures – will, first, enable CIRCLES to increase knowledge on the importance of food system microbiomes as determinants of productivity, quality, safety and sustainability.

SC 2 – Blue Growth

NewTechAqua – New Technologies, Tools and Strategies for a Sustainable, Resilient and Innovative European Aquaculture



NewTechAqua

1 January 2020 - 31 December 2023

The project intends to expand and diversify EU production of finfish, molluscs and microalgae by developing and validating technologically-advanced, resilient and sustainable new solutions. The organizational approach of NewTechAqua is to group the solutions in 6 different categories: feed, Industry 4.0, sustainable farming, genetics, new species and new products. They will be validated on conventional (Atlantic salmon, rainbow trout, seabass and seabream) and emerging (greater amberjack, meagre, Senegalese sole and grey mullet) finfish species, molluscs (Pacific oyster, mussel) and microalgae.

PRIMA SECTION 1



FIT4REUSE - Safe and sustainable solutions for the integrated use of non-conventional water resources in the Mediterranean agricultural sector

01 July 2019 - 31 December 2022

The project FIT4REUSE provides safe, sustainable and accepted ways of water supply for the Mediterranean basin by exploiting non-conventional water resources.

Treated wastewater and desalinated water can contribute to compensate the gap between agricultural water demand and supply and provide consistently high-quality water throughout the year.

FIT4REUSE focuses on innovative, sustainable and safe treatment technologies, and on the use of treated wastewater and desalinated water in agriculture and for aquifer recharge. Also, specific methodological and assessment tools will be created to meet the project objectives.



Boosting Nexus
Framework Implementation
in the Mediterranean

BONEX Boosting Nexus Framework Implementation in the Mediterranean

2021 – 2024

BONEX project aims to provide practical and adapted tools, examine concrete and context-adapted technological innovations, enhance policies and governance and facilitate WEF Nexus practical implementation that balances the social, economic, and ecological trade-offs.

ON-GOING HORIZON 2020 PROJECTS IN WHICH UNIBO IS PARTNER

SC 2 – Sustainable Food Security

[SHOWCASE - SHOWCASing synergies between agriculture, biodiversity and Ecosystem services to help farmers capitalising on native biodiversity](#)



1 November 2020 – 31 October 2025

The project aims to shed light on these issues by reviewing and testing the ecological effectiveness of a range of economic and societal incentives to implement biodiversity management in farming operations and examine farmer and public acceptance. The project is focusing on result-based incentives, involvement in citizen science biodiversity monitoring and biodiversity-based business models. Moreover, it designs communication strategies that are tailor-made for farmers and other key stakeholders operating in different socio-economic and environmental conditions.

[WATERAGRI – Water retention and nutrient recycling in soils and streams for improved agricultural production](#)



1 May 2020 – 30 April 2024

The project aims to re-introduce and enhance sustainable solutions for water retention and nutrient recycling to enable agricultural production that can sustain growing populations and cope with present and future climate change challenges. The project strives to generate a deeper, more detailed and integrated understanding of the hydrological processes shaping water resources in Europe.

[InnoVar – Next generation variety testing for improved cropping on European farmland](#)



1 October 2019 – 31 March 2024

InnoVar develops next generation plant variety testing by building tools and models that augment current practices capitalising on advances in genomics, phenomics, imaging technologies and machine learning. The InnoVar database, populated with historical and de novo genotypic, phenotypic and environmental data aims at facilitating model development and evaluation for revision of DUS and VCU processes.

[NEXTGENPROTEIN – Bioconversion of Underutilized Resources into Next Generation Proteins for Food and Feed](#)



1 October 2019 – 30 September 2023

The project demonstrates the suitability and economic viability of the alternative proteins in food and feed value chains and explore their market opportunities with

the industry, stakeholders, policymakers and consumers. NextGenProteins finds means to improve the acceptability and trust of consumers towards alternative proteins and processes. The project contributes to strengthening food security, sustainability and self-sufficiency of EU protein production with future-proof supply, as well as long-term reduction of land use, water use, GHG emissions and energy of EU food sector.

[WeLASER – Sustainable weed management in agriculture with laser-based autonomous tools](#)



1 October 2020 – 30 September 2023

The project develops a non-chemical solution for weed management based on pioneering technology consisting of the application of lethal doses of energy on the weed meristems through a high-power laser source. An AI-vision system separates crops from weeds, identifying the weed meristems and pointing the laser at them. A smart controller based on IoT and cloud computing techniques coordinates the system, which is transferred all over the field by an autonomous vehicle.

[ROADMAP – Rethinking Of Antimicrobial Decision-systems in the Management of Animal Production](#)



1 June 2019 – 31 May 2023

ROADMAP fosters transitions towards prudent antimicrobial use (AMU) in animal production in a large variety of contexts, by favouring a rethinking of antimicrobial decision-systems all along the food supply chain. ROADMAP develops innovative conceptual approaches within a transdisciplinary and multi-actor perspective to engage with animal health professionals, stakeholders and policy-makers. It adapts, combines and produces tailored strategies to reduce AMU in diverse production systems in Europe and low- and middle-income countries (pig, poultry, cattle and fish sectors).

SC 2 – Blue Growth

[EuroSea - Improving and Integrating European Ocean Observing and Forecasting Systems for Sustainable use of the Oceans](#)

1 November 2019 – 1 December 2023



EuroSea brings together key European actors of ocean observation and forecasting with key end users of ocean observations, responding to the Future of the Seas and Oceans Flagship Initiative. Our vision is a truly interdisciplinary ocean observing system that delivers the essential ocean information needed for the wellbeing, blue growth and sustainable management of the ocean. EuroSea strengthens the European and Global Ocean Observing System (EOOS and GOOS) and supports its partners. EuroSea increases the technology readiness levels (TRL) of critical components of ocean observation systems and tools, and in particular the TRL of the integrated ocean observing system.

[BIO-PLASTICS EUROPE – Developing and Implementing Sustainability-Based Solutions for Bio-Based Plastic Production and Use to Preserve Land and Sea Environmental Quality in Europe](#)



1 October 2019 – 30 September 2023

Based Solutions for Bio-Based Plastic Production and Use to Preserve Land and Sea Environmental Quality in Europe. Bio-Plastics Europe focuses on sustainability strategies and solutions for bio-based products to support the Plastics Strategy. The tasks includes innovative product design and business models in order to facilitate efficient reuse and recycling strategies and solutions, including ensuring the safety of recycled materials when used for toys or food packaging.

[FutureEUAqua – Future growth in sustainable, resilient and climate friendly organic and conventional European aquaculture](#)



1 November 2018 – 30 April 2023

The overall objective of FutureEUAqua is to effectively promote sustainable growth of resilient to climate changes, environmentally friendly organic and conventional aquaculture of major fish species and low trophic level organisms in Europe, to meet future challenges with respect to the growing consumer demand for high quality, nutritious and responsibly produced food. To this end, FutureEUAqua promotes innovations in the whole value chain, including genetic selection, ingredients and feeds, non-invasive monitoring technologies, innovative fish products and packaging methods, optimal production systems such as IMTA and RAS, taking into account socioeconomic considerations by the participation of a wide spectrum of stakeholders, training and dissemination activities.

SC 2 – Rural Renaissance

[INTAQT – Innovative tools for assessment and authentication of chicken and beef meat, and dairy products' qualities](#)

1 June 2021 - 31 May 2026



The EU-funded INTAQT project will perform an in-depth multi-criteria assessment of the relationship between husbandry systems and intrinsic quality traits of animal-sourced products. Researchers will develop quality assessment and authentication tools that provide science-based decision support for policy makers, industries, farmers and consumers, in addition to improving husbandry practices. The initiative will focus on unprocessed and processed ready-to-eat chicken meat, beef and dairy products stemming from husbandry systems of different European countries.

[LOWINFOOD – Multi-actor design of low-waste food value chains through the demonstration of innovative solutions to reduce food loss and waste](#)



1 November 2020 – 28 February 2025

The project tests the effectiveness of selected innovative solutions following a method that engages actors along the entire food value chain. The main goal of the project is to co-design low-waste value chains in the fruit and vegetable, baked goods and fish sectors, including at-home and out-of-home consumption. The project validates and demonstrates a set of technological, social and organisational solutions, and evaluate the impact of these innovations in reducing food waste and improving the socioeconomic and environmental performance of the value chains. The LOWINFOOD consortium is made up of universities, research institutions, start-ups, foundations, associations and companies related to the food sector.

[CO-FRESH – CO-creating sustainable and competitive FRuits and vEgetableS’ value cHains in Europe](#)



1 October 2020 – 31 March 2024

The project develops techniques, tools and insights centring on the redesign of fruit and vegetable value chains. With a consortium that brings together farmers, cooperatives and consumers as well as technological, environmental and economic experts, the project studies models of collective innovation action within and across organisations. The aim of the project is to design innovative systemic approaches to improve the economic, social and environmental performance of these value chains and ensure sustainability through the smart integration of innovations.

[SHERPA - Sustainable Hub to Engage into Rural Policies with Actors](#)



1 October 2019 – 30 September 2023

The objective of SHERPA is to gather relevant knowledge and opinions that contribute to the formulation of recommendations for future policies relevant to EU rural areas. The project aims at: i) taking stock of scientific evidence relevant to future rural policy and research activities; ii) using this evidence to engage citizens, researchers and policy makers at local and EU levels in debates about options for policy and priorities for research, iii) using the outcomes of engagement to formulate recommendations for rural policies relevant the period post-2020, and future agendas for research.

SC 2 – Food and Natural Resources

[RES4LIVE - Energy Smart Livestock Farming towards Zero Fossil Fuel Consumption](#)



1 October 2020 – 30 September 2024

From producing fertilisers to packaging olives, farms rely too much on unsustainable fuels. Farmers in Belgium, Italy, Germany and Greece have teamed up to show that it is possible to reduce agriculture's fossil fuel dependence and move towards the adoption of renewable energy sources. The team are part of the EU-funded RES4LIVE project, which demonstrates the selected technologies, including PVT systems, PV panels, modular heat pumps, biogas upgrading to biomethane, biomethane-fuelled tractors

and electrically powered on-farm machinery. The aim is to replace the use of fossil fuels for certain needs in the pilot farms, proving that it is possible to achieve sustainable farming that is efficient, cost effective and low maintenance.

[COOPID - COOPeration of bioeconomy clusters for bio-based knowledge transfer via Innovative Dissemination techniques in the primary production sector](#)



1 January 2021 - 30 June 2023

The project is proposing a new strategy. A network of COOPID Bioeconomy Clusters from 10 European countries has been created ad hoc, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. Based on the proposed model, COOPID ambassadors showcase success stories, organise workshops and conduct interactive dissemination and communication campaigns. One of the main target groups are in fact women and young producers who have great potential to innovate but are underrepresented in the primary production sector.

[Transition2BIO - Support the TRANSITION towards the BIOeconomy for a more sustainable future through communication, education and public engagement](#)



1 January 2021 - 31 December 2022

The project is proposing an integrated package of activities addressing a wide range of stakeholders (demand side, supply side, multipliers and supportive environment). It valorises and exploits sectoral communication tools and activities, raise public awareness of bioeconomy and contribute to the transition towards more sustainable production through engagement and education activities. The project is promoted by the founders of the European Bioeconomy Network, an alliance of more than 70 projects and initiatives promoting bioeconomy.

Bio-Based Industries (BBI)

[INGREEN – Production of functional innovative ingredients from paper and agro-food side-streams through sustainable and efficient tailor-made biotechnological processes for food, feed, pharma and cosmetics](#)



1 June 2019 - 30 November 2022

INGREEN aims to demonstrate in industrial environments the efficiency and sustainability of biotechnologies –based on safe microorganisms or eco-friendly approaches- to produce i) lactobionic acid (LBA), galactooligosaccharides (GOS), microbial safe biomasses from whey; ii) polyhydroxyalkanoates (PHA) enriched biomasses and purified PHA, as prebiotics and bioplastics respectively, from paper mill wastewater; iii) functional pre-fermented ingredients from rye/wheat milling fractions.

USABLE PACKAGING – Unlocking the potential of Sustainable Biodegradable Packaging

1 June 2019 - 30 November 2022

USABLE PACKAGING



USABLE Packaging develops high performance plastic packaging through a sustainable and fully circular value chain, where the biomass raw material sourcing derives from food processing side streams, to obtain, via a low footprint biochemical processing, a portfolio of bio-based biodegradable building block materials enabling the realisation of complex packaging structures. USABLE Packaging concept is designed to retrofit the existing state of the art packaging processing technology by controlling the chemical and physical properties of the base building blocks materials.

Prolific - Integrated cascades of PROCesses for the extraction and valorisation of proteins and bioactive molecules from Legumes, Fungi and Coffee agro-industrial side streams



1 September 2018 - 31 August 2022

The PROLIFIC project applies a range of processing technologies to recover significant amounts of proteins/peptides and other value added compounds (e.g. carotenoids, phenols, caffeine and fibres) from industrial processing residues of legumes (seeds of peas, beans and chickpea), fungi (cuttings and mycelia of different species) and coffee (silver skin residue and not compliant roasted seeds).

AgriMax – Agri and food waste valorisation co-ops based on flexible multi-feedstocks biorefinery processing technologies for new high added value applications



1 October 2016 - 30 September 2021

AgriMax combines affordable and flexible processing technologies (ultrasound assisted and solvent extraction, filtration, thermal and enzymatic treatments) for the valorisation of side streams from the horticultural culture and food processing industry to be used in a cooperative approach by local stakeholders.

FIRST2RUN – Flagship demonstration of an integrated biorefinery for dry crops sustainable exploitation towards biobased materials production



1 July 2015 - 30 June 2019

The FIRST2RUN flagship project aims at demonstrating the techno, economic and environmental sustainability at industrial scale of a first-of-kind value chain where low input and underutilized oil crops (i.e. cardoon) grown in arid and/or marginal lands and not in competition with food or feed, are exploited for the extraction of vegetable oils to be further converted into bio-monomers (mainly pelargonic and azelaic acids) as building blocks for high added value bioproducts, biolubricants, cosmetics, bioplastics, additives through the integration of chemical and biotechnological processes.

BIOWAYS – Increase public awareness of bio-based products and applications supporting the growth of the European bioeconomy



1 October 2016 - 30 September 2018

This project aims to evaluate the relationships between community attributes (species richness, composition, evenness, cover, and spatial pattern) and key processes related to ecosystem functioning under different global change scenarios.

NMBP – BIOTEC

PRESERVE - High performance sustainable bio-based packaging with tailored end of life and upcycled secondary use



1 January 2021 - 31 December 2024

PRESERVE aims at boosting the circular use of bio-based packaging. To shift from the current situation (fossil-based, limited recycling), we build on award-winning upcycling strategies from past and on-going projects. We enhance the performance of primary food packaging via bio-based barrier coatings for bioplastic and paper/board substrates, as well as via eBeam irradiation and microfibrillar-reinforcement.

ELECTRA - Electricity driven Low Energy and Chemical input Technology for Accelerated bioremediation



1 January 2019 - 31 December 2022

The project delivers two innovative sets of pioneering electromicrobiology technologies aiming to accelerate the elimination of pollutants in contaminated soil, sediment and waters. The project relies on environmental technologies that facilitate and improve electron transfer during microbial degradation processes. The first set uses bioelectrochemical systems that require low energy and no chemical addition. The second uses electromicrobial technologies that do not require energy and need minimal chemical amendment.

INNOVATIONS @UNIBO

Patents

Since 2005, SUNIBO filed **patents related to Bioeconomy**, connected to **45 inventions**: 20 inventions belong to the **agri-food** sector (with 20 active patents), while 25 inventions fall under **Circular economy, Green chemistry and Bio-based economy** (25 patents).

Priority Year	Agri-food	Priority Year	Circular Economy, Green Chemistry and Bioeconomy
2005	Method and apparatus for determining the quality of fruit and vegetable products	2007	Method for the treatment of plant matrices
2008	Oil clarifying process and apparatus for implementing the process	2007	Procedure for obtaining aqueous extracts from carotenoids and extracts
2009	Yellow Kiwi Variety: Dorì	2011	Substituted diarylamines and use of same as antioxidants
2014	A sprayable dispersed starch-based bioplastic formulation to control pests	2014	Method and plant for the conversion of mainly cellulosic material
2015	Composition and method for promoting the growth of herbaceous plants and favouring an accumulation of organic matter in the soil	2015	Biological and stand-alone super-capacitors for water treatment
2015	DNA Marker for the identification of Cinta Senese pig and related method and kit for identification	2015	Double lamellar organo-modified hydroxides and polymeric composite materials
2015	Packaging for fruit and vegetable products treated with an antimicrobial solution	2016	Use of mesoporous silica
2017	Method for evaluating the dispersion of particles	2016	Organic electrochemical transistor based on conductive polymer and Ag, AgX (X - Cl, I, Br) halide nanoparticles, as chemical sensor
2017	Method for producing a tumeric-based oil solution for food use	2016	Method for separating and recovering polyethylene and aluminium from a poly laminated material
2017	A method and system for the production of an olives - and tomatoes - based dressing naturally rich in antioxidants	2016	Antioxidants and methods to maximize performance
2017	The invention refers to a new yeast strain that can be used in the processing of transformed foods to reduce acrylamide (following cooking/frying).	2017	Improved process for the transformation of primary aliphatic alcohols into higher aliphatic alcohols

2017	A device for stabilizing wine and other vegetable beverages and the related stabilizing method	2017	Production of carboxylic acids from vicinal diols
2018	Yeast strain usable against fungal infections in edible fungi	2018	Process for producing monocarboxylic acids from agroindustrial waste and organic waste.
2018	Blend of essential oils and / or hydrolates from plants of Italian origin to be applied to the development of a nutraceutical to promote gastro-intestinal and genito-urinary microbial and immune balance.	2018	Silicon nanostructures as luminescent markers for the recycling of plastic
2018	System, method and device for detecting tannins in a liquid	2019	N-alkyl-D-glucamine based macroporous polymeric cryogel for sequestering and/or removing toxic contaminants
2018	Process for the transfer of volatile fatty acids through an organic-based liquid membrane	2019	Catalyst including coke and procedure for the production of dienes.
2021	Method of extracting polyamines from a natural matrix	2019	A luminescent sensor for nano/micropastics
2021	Method and system for soil-moisture monitoring	2020	Magnetic catalyst for the reducing catalytic splitting up of lignocellulosic
2021	Use of non-woven fabric including polylactic acid (PLA) for the inoculation of plants to be mycorrhized, especially for truffle cultivation	2020	Apparatus for sanitising containers and tools
2022	Method for the treatment of intestinal disorders in pets and farm animals	2020	Valorisation of starch-based polymeric materials through pyrolysis
		2020	Polymer Composition Including Leather Fibers
		2021	Method for manufacturing a composite material for the recovery of nutrients and removal of pollutants from wastewater, composite material and its use
		2021	Thermally stable carboxylic ester hydrolases in layered double hydroxides for intrinsic recyclable polymers
		2021	Procedure for the production of a mixture that can be used as a jet fuel starting from C2-C4 alcohols and relative production plant

Start-Ups

	Description
<u>Crossing</u> Materials/ Packaging Active since 2014	<p>Crossing has specialised in the low-cost production of a whole new class of 'cross-linking activators' or 'ACLs'. ACLs are able to cross-link together a variety of natural and/or synthetic materials, without leaving a trace in the finished product. This makes it possible to obtain highly sustainable, cheaper and cost-effective products and production processes in moulding directly onto the packaging.</p>
<u>LUMO</u> FoodTech/ Sustainability Active since 2018	<p>LUMO develops off-grid, sustainable waste water treatment systems for people living in precarious hygiene conditions. Creating partnerships with NGOs and private foundations involved in the achievement of SDG N. 6, LUMO is committed to creating social, environmental, and economic value for everyone involved in the project.</p>
<u>Spin – PET</u> Circular Economy/ Materials/ Packaging Active since 2009	<p>Research, design, realisation, and collaboration in the marketing, in Italy and abroad, of materials and products made from post-industrial and post-consumer polymers, as well as composite materials and process additives and auxiliaries to obtain the required final properties.</p>
<u>Squiseat</u> Foodtech/ Circular Economy Active since 2019	<p>Squiseat is a digital accredited startup company with a focus on the circular economy, and especially on the issue of food waste. Its business model is based on a marketplace, where merchants are businesses in the food supply chain that have surpluses while customers are all the players potentially interested in these products.</p>
<u>Weeshop</u> FoodTech/ Sustainability Active since 2020	<p>Weeshop is a mobile app that helps consumers choose food products in a simple and informed way based on real characteristics such as quality, healthiness, sustainability, and social impact. With Weeshop – through text searches or scanning barcodes – users will find ready collected and clearly presented information on products and producers, allowing them to compare items quickly and filter them by characteristics.</p>

Spin-offs

	Description
AlmaPlasma Industry 4.0/ Manufacturing/ Life Science <i>Active since 2013</i>	AlmaPlasma develops, produces and markets technologically advanced solutions in the field of thermal plasmas and non-thermal plasmas at atmospheric pressure. It provides advanced solutions in the broad sector of plasma technology applications, bringing into the market the unique expertise developed in over 20 years by the Industrial Plasma Applications (IAP) group of the Department of Industrial Engineering (DIN) of the University of Bologna
Aquaponic Design Agri-food <i>Active since 2021</i>	Planning, construction, and management of soil-free cultivation systems, focusing particularly on aquaponic systems. Professional training processes for private individuals and companies.
B-Plas Biotech/ Bioplastics/ Circular Economy <i>Active since 2021</i>	B-Plas embraces the principles of Green Growth, i.e., an environmentally and socially sustainable path of economic growth. Thanks to an innovative process, it allows sewage sludge to be converted into bioplastics (PHAs, polyhydroxyalkanoates), applying in this way a concrete and effective solution to the 'sludge problem'.
Greenarco Building and infrastructures / sustainability <i>Active since 2019</i>	Greenarco develops nature-based solutions (NBS) as innovative processes for the implementation and urban improvement through the design of Green Infrastructures (or Green Infrastructures - GI). These are aimed at the conversion and redevelopment of industrial, commercial and abandoned infrastructure areas.
Griffa Biotech <i>Active since 2020</i>	GRIFFA SRL is an innovative startup company specialising in the genetic authentication of food, agri-food chain traceability and environmental DNA analysis. GRIFFA uses state-of the-art next generation DNA sequencing technologies and its team has expertise in various fields of biology: genetics, genomics, molecular biology, cellular biology and computational biology. Through its services, GRIFFA provides information on the nature of different biological, environmental and forensic matrices.
Hydrosynergy Environmental consultancy and monitoring/ ichthyology <i>Active since 2010</i>	The mission of Hydrosynergy is to provide sustainable management of the wildlife heritage, offering services of environmental monitoring with an operational and analytical approach. Hydrosynergy operates molecular determination, systematic approach to complex situations (cryptic species), characterization of freshwater, wetlands and ecotonal habitats and analysis of ecosystem functionality.
LAC2LAB Circular economy <i>Active since 2021</i>	Lac2Lab is a SIAVS, i.e. an innovative social startup, which develops innovative additives for the Life Science industry, made from milk that is either expired or about to expire: such waste milk is supplied by large retailers and producers and would otherwise go to waste.
Last Minute Market	Last Minute Market Srl has been involved in reducing wastes for over 15 years with lots of projects for regional entities or companies around the nation. Last minute market Srl supports companies in the recovery

Agroindustrial/ trade&distribution / non- profit <i>Active since 2008</i>	of surplus food in favor of non-profit organizations. Today fields of activity have expanded to other types of goods (eg. medicines and non-food), and, thanks to the different services always more innovative, we deal with waste prevention in 360 °.
Law Food Safety Agri-food/ Blockchain <i>Active since 2019</i>	Service Enterprise whose mission is to promote the food security and protect the consumer giving value to quality products through the tracking and monitoring of food supply chains in real time with the most modern IoT and blockchain technologies
Phenbiox HealthTech, FoodTech <i>Active since 2006</i>	Phenbiox develops and produces plant-derived high performance active ingredients for cosmetics, food and food supplements finished products. It provides customers with high-quality products with proven efficacy. They use their technology in order to both increase the speed of effect of the active ingredients and boost the effectiveness of their products.
Targeting Gut Disease Pharma <i>Active since 2015</i>	Analysis and design of food or nutraceutical products based on natural plant extracts with anti-inflammatory and anti-disbiotic effects on the gastro-intestinal system. It is able to propose complex development and testing plans that integrate in vitro studies with pre-clinical trials with clinical trials on healthy subjects or on patients.

R&I NETWORKS AND AFFILIATIONS

Association	Bio-based industries consortium (BIC) Associate member
Short description	BIC is a non-profit organisation set up in Brussels in 2013. BIC represents the private sector in a Public-Private Partnership (PPP) with the European Commission, also known as the Bio-based Industries Joint Undertaking (BBI JU). This public-private partnership invested € 3.7 billion in bio-based innovation between 2014 and 2020. The BBI JU, operating under Horizon 2020, was set up as one of the pillars of the EU Bioeconomy strategy (2012). The BBI JU is dedicated to transforming renewable, natural resources into bio-based products through a programme of research and innovation (R&I) activities. In 2021 the first BBI JU priorities are to maintain the operational standards at the highest quality and ensure the absorption of the workload peak, and deploy the transition to the next Framework Programme Horizon Europe and partnership.
Useful links	https://biconsortium.eu/

Association	CO2 value Europe (CO2) Associate member
Short description	CO2 Value Europe is the industry-driven European Association which is committed to promote the development and market deployment of sustainable industrial solutions that convert CO2 into valuable products, in order to contribute to the net reduction of global CO2 emissions and to the diversification of the feedstock base away from fossil oil and gas. It is the ambassador and spokesperson of the CCU community in Europe, raising awareness and gaining acceptance of the enormous potential of CCU to bring value to Europe both from a climate and from an economic perspective. Moreover, CO2 works with EU and national policy makers to stimulate the development of a favourable regulatory and market framework, as required to create a business case for the commercial deployment of CCU solutions. Finally, It supports the development of flagship industrial demonstration projects by connecting partners with relevant expertise along the CCU value chain, helping them get access to public and private sources of funding and also facilitating the development of a collective intelligence on CO2 capture and conversion technologies.
Useful links	http://www.co2value.eu/

Association	EIT Food Gold Core member
--------------------	-------------------------------------

Short description	EIT Food is Europe's leading food innovation initiative, working to make the food system more sustainable, healthy and trusted. EIT Food, established by the European Institute of Innovation & Technology (EIT), proposes to build an inclusive and innovative community of diverse food sector partners driving innovation and entrepreneurship across Europe. This is achieved through 6 strategic objectives: to overcome low consumer trust, to create consumer-valued food for healthier nutrition, to build a consumer-centric connected food system, to enhance sustainability through resource stewardship, to educate to engage, to innovate and advance, to catalyse food entrepreneurship and innovation.
Useful links	https://www.eitfood.eu/

Association	European Bioeconomy University (EBU) EBU presidents board member
Short description	The European Bioeconomy University is Europe's leading intellectual institution in tackling the enormous environmental, economic and societal challenges of the 21st century. It acts not only as a think tank for knowledge generation, but also as a creative hub for knowledge transfer to transform diversity into creativity, support the European approach of democratic, transparent and participative processes and foster actual change in an innovative and sustainable way. As a new form of inter- and transnational university, it builds a bridge across disciplines, bringing students and researchers together in their efforts to create a knowledge-based bioeconomy in Europe.
Useful links	https://european-bioeconomy-university.eu/

Association	European bioplastics (EUBP) Associate member
Short description	European Bioplastics represents the interests of the thriving bioplastics industry in Europe. We at European Bioplastics are committed to driving the evolution of plastics by raising awareness across all relevant stakeholder groups about the benefits of bioplastics in reducing our dependency on fossil resources, reducing harmful greenhouse gas emissions, and using renewable resources more efficiently. European Bioplastics is uniquely placed in the industry with an extensive network of businesses, partners, and experts in the bioplastics sector across Europe and beyond. Our annual European Bioplastics Conference is the leading business and networking event for the entire industry.
Useful links	https://www.european-bioplastics.org/

Association	European marine research network (EURO MARINE) Full member
--------------------	--

Short description	EuroMarine is a European marine science network launched in 2014. It was designed by the EuroMarine preparatory project as a bottom-up organization and meant to be a voice for the European marine scientific community. The primary mission of EuroMarine is to advance the economic and regulatory framework in Europe to allow for the bioplastics market to grow and flourish. In special, it aims for a favourable policy and economic framework to allow for the further technological advancement and full-scale market introduction of bioplastics and promotes coherent standards, certifications and guidelines for transparent claims about bioplastics and their environmental benefits & impact. Also, Euromarine advocates sustainable growing of biomass crops for the production of biobased plastics and supports the implementation of a better waste management infrastructure, including more efficient re-use, recycling, and recovery systems.
Useful links	https://www.euromarinetwork.eu/

Association	European plant science organization (EPSO) Institutional member
Short description	EPSO, the European Plant Science Organisation, is an independent academic organisation currently representing 70 institutional members bringing together more than 200 research institutes, departments and universities from 31 countries in Europe and beyond. EPSO's mission is to improve the impact and visibility of plant science in Europe. EPSO's top priorities are to provide advice on science policy towards a strategic approach and critical mass funding for basic and applied research across Europe, to coordinate research activities at the national and European levels – and beyond, and to facilitate the understanding of plant science.
Useful links	https://epsoweb.org/

Association	European Reference Genome Atlas (ERGA) Member of ERGA and ERGA Italy
Short description	The European Reference Genome Atlas (ERGA) initiative is a pan-European scientific response to current threats to biodiversity. ERGA advocates for the importance of generating high-quality reference genome sequences. Reference genomes provide the most complete insight into the genetic basis that forms each species and represent a powerful resource in understanding how biodiversity functions. With approximately one fifth of the ~200,000 European species at risk of extinction, we need to act fast and together to generate high-quality complete genome resources in large scale. From species selection to data analysis, the process of creating reference genomes for the entire biodiversity will involve a deep synergy among museums, research institutes, universities, sequencing centres, bioinformatics and computational groups. Citizens will also play an important role supporting the inclusion of all types of species.

	The goal of ERGA is to: (1) create and consolidate a collaborative and interdisciplinary network of scientists across Europe and associated countries, (2) Connecting relevant infrastructure across Europe following a distributed model that can dynamically increase; (3) Propagating guidelines for state-of-the-art genome establishment through training and knowledge transfer.
Useful links	https://www.erga-biodiversity.eu/

Association	European Research Alliance (ERA-pesticide free) Associate Member
Short description	The purpose of the Research Alliance is to help develop a sustainable European agri-food system free of chemical pesticides. To achieve this, the Partners work together and with other relevant actors to develop a transdisciplinary research and innovation agenda that is aligned with the European Green Deal priorities to deliver an environment-friendly, sustainable, fair, just and competitive agri-food sector across the whole value chain. This research and innovation agenda will serve as a basis to facilitate discussions within the European Union and global agricultural community to establish high impact, tangible research and innovation projects on this topic.
Useful links	https://www.era-pesticidefree.eu/

Association	European Sustainable Phosphorus Platform (ESPP) Associate member
Short description	ESPP was formed in March 2013 through a declaration, signed by over 150 organisations after the first European Sustainable Phosphorus Conference. ESPP ensures knowledge sharing, experience transfer and networking for opportunities in the field of phosphorus management, facilitates discussion between the market, stakeholders and regulators, addresses regulatory obstacles, contributes to policy proposals, circulates information by newsletters, website, conferences and publications, promotes Platform Members' activities, and contributes to define a long-term vision for phosphorus sustainability in Europe.
Useful links	https://www.phosphorusplatform.eu/home2

Association	Farm Animal Breeding & Reproduction Technology Platform (FABRE) Associate member
Short description	FABRE TP is an industry-led platform of breeding and reproduction organisations and knowledge institutes, with members located across Europe. Together we share a common vision on farm animal breeding and reproduction to enhance the sustainability of farm animal production in Europe, and globally, through development and uptake of better approaches to breeding and reproduction. FABRE TP aims to grow the commitment of the involved stakeholders, including industry, knowledge institutes and funding organisations.

Useful links	https://www.fabretp.eu/
---------------------	---

Association	FOODforce Network Member (no fixed fee)
Short description	FOODforce is a network of leading European research provider organisations active in the areas of food, nutrition and health aiming to provide a forum for facilitating collaborative research and interaction amongst members and interaction with the concerning EU secretariats, promoting the mobility of researchers (particularly early career scientists) and the exchange best practice in managing food and health research, facilitating the dissemination of information focused on research-related issues, expanding relationships with Third Countries relevant to EU initiatives, also articulating with the European Technology Platform Food for Life and other relevant organisations.
Useful links	https://www.foodforcenetwork.eu

Association	Global Center for Food Safety (DISH) Partner
Short description	DISH is non-profit platform set up by the Italian University of Bologna, the Chinese Hong Kong Polytechnic University, the Sweden University of Lund and the Danish Technical University in Copenhagen aiming to foster food safety, with particular attention to sustainable agricultural production. The centre aims to translate cutting-edge innovations and into high quality applications through research, development, exploring collaborations and technology transfer. This partnership will effectively synergize the expertise and dedications of all four universities and our extensive networks to solve global, everyday food safety challenges with world-class solutions.
Useful links	https://www.polyu.edu.hk/itdo/fsc/en/index/DISH

Association	Health Grain Forum (HGF) Associate member
Short description	The Health Grain Forum, based in Europe and with links worldwide, is an active network of universities, institutes and industries interested in grain and grain-based products. Its vision is that whole grain and high fibre grain-based foods assist consumers in health maintenance worldwide, help reduce health care costs and provide added value for companies in the production chain from farm to fork. The forum is formulating priorities for research and communication activities, with the overall aim of increasing consumers' intake of protective components in whole grains.
Useful links	https://healthgrain.org/

Association	National Technology Cluster on Agrifood (CTN CLAN) Associate member
Short description	National Technology Agrifood Cluster CL.A.N. is a multi-stakeholder network of the key national players of the entire agrifood chain - a partnership of companies, research centres and institutions set up to promote sustainable economic growth, based on research and innovation in the industry and acting as partner for Italian and European Institutions. Cluster CL.A.N. can rely on the experience gained by the Members through initiatives such as the European Technology Platform Food for Life, the National Technology Platform Italian Food for Life, later joining the Cluster, and the Consortium FoodBest - FoodNexus, set up to take part in the call for tender of the European Institute of Technology aimed at funding a food-based KIC (Knowledge and Innovation Community). The regional representation of the Cluster is equally significant. Eleven Italian regions have indeed joined it: Abruzzo, Emilia-Romagna, Lombardy, Marche, Molise, Piedmont, Apulia, Sardinia, Sicily, Tuscany, Umbria.
Useful links	https://www.clusteragrifood.it/it/

Association	National Technology Cluster on Sustainable Processes and Resources for Innovation and National Growth (CTN SPRING) Associate member
Short description	CTN SPRING aims to foster the development of bioindustries in Italy through a holistic approach to innovation, meant to revive the Italian chemical sector under the name of environmental, social and economic sustainability. It also stimulates research and investments in new technologies in the bioeconomy sector, while constantly engaging in a fruitful dialogue with the stakeholders in the local areas. CTN SPRING also coordinates the activities of the National Technological Cluster of the Green Chemistry to pursue the goals of the Strategic Development Plan.
Useful links	http://www.clusterspring.it

Association	National Technology Cluster on Blue Italian Growth (CTN BIG) Associate member
Short description	CTN BIG is made of a large group of universities, public research centres and private companies involved in the marine industry. Its aim is to generate opportunities for the innovative and technological development of the national shipping and maritime industry, in line with the National Programme of Research (PNR) 2015-2020. CTN BIG is designed to remain in full harmony with the main development trajectories: Marine environment and coastal zone; Blue biotechnology; Renewable energy from the sea; Abiotic marine resources; Marine biotic resources; Shipbuilding and marine robotics. In parallel, cross-cutting topics will also be discussed Skills&jobs, Research Infrastructures, and Sustainability and economic uses of the sea. CTN BIG operates in full harmony with the main policy objectives at global, European and Mediterranean levels and is designed to respond to major social challenges in a sustainable manner. CTN BIG takes into account

	macroeconomic trends, characteristic of the sector and working to restored and maintain works to preserve and improve the environment.
Useful links	http://www.clusterbig.it/

Association	Water Europe (WE) Associate member
Short description	Water Europe (WE) was first initiated by the European Commission (EC) in 2004 as the European Technology Platform (ETP) for water with the name WsTP. In 2007, it was transformed into a member-based multistakeholder platform under Belgian law titled Water Europe. Since then, the membership and activities of the organisation have continuously grown and evolved in line with its ambition to represent the whole value-chain of water and achieve a European Water-Smart Society. WE's mission is to improve coordination and collaboration in water sector and water using sectors in the EU and beyond. The goal is to enhance the performance and competitiveness of the European water sector and to contribute to solving global challenges through research and innovation.
Useful links	https://watereurope.eu/

MAIN R&I EXPERTISE – CBE JU

HORIZON-JU-CBE-2023-IA-01: Small scale biorefining in rural areas	
Research Group	<u>Annalisa Tassoni</u> Department of Biological, Geological, and Environmental Sciences
Short Bio of the Research Group	The research group focuses on the isolation and characterization of animal and plant proteins and peptides and of bioactive compounds (polyphenols, phytosterols, etc) from agro-industrial biomass/wastes/by-products; Testing of extracts for bioactivity.
Expertise in relation to the topic	Expertise in the extraction and characterization of bioactive molecules from several agro-industrial by-products, by means of chemical, physical and enzymatic methods. Metabolomic analysis. Expertise in the determination of extracts' biological activities.
Relevant technologies	Fermentors, UPLC MS/MS, HPLC-DAD, HPLC-FL
Previous EU funded projects & relevant publications	Partner of AGRIMAX project (in which I have participated in the development of the Italian rural biorefinery); Scientific coordinator of 2018-2022 H2020-BBI PROLIFIC "Integrated cascades of processes for the extraction and valorization of proteins and bioactive molecules from legumes, fungi and coffee agro-industrial side streams".

HORIZON-JU-CBE-2023-IA-01: Small scale biorefining in rural areas	
Research Group	<u>Lorenzo Bertin</u> Department of Civil, Chemical, Environmental, and Materials Engineering
Short Bio of the Research Group	Lorenzo Bertin received his Ph.D. in Industrial Chemistry in the 2003. From 2001 to 2014 he was Assistant Professor of Organic Chemistry at the Engineering Faculty of the University of Bologna. From September 2014 he is Associated Professor in "Chemistry and Biochemistry of the Fermentations" and from March 2018 in "sanitary and environmental engineering". His main research activities focused and focus on the development of non-conventional aerobic and anaerobic biotechnological processes, mainly dedicated to the bioremediation of actual-site contaminated environmental matrices and to the bioconversion of biowaste into biogas, chemicals and biopolymers according to the biorefinery approach. He is the lead scientist of Research Units in EU and national projects. He published 63 full papers in international journals with IF and 8 book chapters. He got about 2000 citations, with a H-index of 31 (Scopus database, March 2022).
Expertise in relation to the topic	Development of biorefinery scheme fed by agro-waste for the a) recovery of added-value molecules (e.g., polyphenols), b) production of small chain-fatty acids (among which, hexanoic acid) and

	polyhydroxyalkanoates (among which, polyhydroxyhexanoate, amorphous), production of biogas by anaerobic fermentation.
Previous EU funded projects & relevant publications	<p>Lanfranchi A.; Tassinato G.; Valentino F.; Martinez G.A.; Jones E.; Gioia C.; Bertin L.; Cavinato C., Hydrodynamic cavitation pre-treatment of urban waste: Integration with acidogenic fermentation, PHAs synthesis and anaerobic digestion processes, «CHEMOSPHERE», 2022, 301, Article number: 134624 , pp. 1 - 9</p> <p>Samori' C.; Martinez G.A.; Bertin L.; Pagliano G.; Parodi A.; Torri C.; Galletti P., PHB into PHB: Recycling of polyhydroxybutyrate by a tandem "thermolytic distillation-microbial fermentation" process, «RESOURCES CONSERVATION AND RECYCLING», 2022, 178, Article number: 106082 , pp. 1 - 7</p> <p>Domingos J.M.B.; Martinez G.A.; Morselli E.; Bandini S.; Bertin L., Reverse osmosis and nanofiltration opportunities to concentrate multicomponent mixtures of volatile fatty acids, «SEPARATION AND PURIFICATION TECHNOLOGY», 2022, 290, Article number: 120840 , pp. 1 - 10</p> <p>Martinez G.A.; Puccio S.; Domingos J.M.B.; Morselli E.; Gioia C.; Marchese P.; Raspolli Galletti A.M.; Celli A.; Fava F.; Bertin L., Upgrading grape pomace contained ethanol into hexanoic acid, fuel additives and a sticky polyhydroxyalkanoate: an effective alternative to ethanol distillation, «GREEN CHEMISTRY», 2022, 24, pp. 2882 - 2892</p> <p>Sarah Notarfrancesco; Elena Morselli; Gonzalo A.Martinez; Weronica Harasimiuk; Joana M.B.Domingos; Andrea Negrone; Fabio Fava; Lorenzo Bertin, Improved recovery of carboxylic acids using sequential cationic-anionic adsorption steps: A highly competitive ion-equilibrium model, «SEPARATION AND PURIFICATION TECHNOLOGY», 2021, 261, Article number: 118253 , pp. 1 - 10</p>

HORIZON-JU-CBE-2023-IA-01: Small scale biorefining in rural areas

Research Group	<u>Andrea Contin</u> Department of Physics and Astronomy "Augusto Righi"
Short Bio of the Research Group	<p>Andrea Contin is Full Professor of Applied Physics, Environmental, Political and Economic Management Systems, and Renewable Energy and Energy Management. The research group (EMRG group) The research group (EMRG group) deals with solutions for:</p> <ul style="list-style-type: none"> • nutrients recovery from wastewater, using material deriving from advanced carbon, with a view to their possible reuse in agriculture • system analysis and models for the assessment of environmental benefits, with particular attention to negative emissions, carbon removal and the certification of carbon credits. • use of advanced carbons (funzionalized biochar) • recovery of critical raw materials • improvement of soil health • Life Cycle Thinking

Expertise in relation to the topic	<p>Thermochemical treatment and valorization of biomasses. Functionalization of biochar for the production of Second Generation Carbons as adsorbent materials (substitute for activated carbons):</p> <ul style="list-style-type: none"> - new functionalized carbonaceous material for water filtration and material recovery - treatment of urban and industrial effluents with recovery of nutrients (P and N) and critical materials - land and water remediation - improvement of agricultural soil - carbon sequestration and carbon credits - biochar and carbon-based materials preparation and production at kg/hr rates
Relevant technologies	<ul style="list-style-type: none"> - dedicated analytical lab - laboratory for medium-high TRL - Field instrumentation for on-site testing - LCA software
Previous EU funded projects & relevant publications	<p>EU funded projects</p> <ul style="list-style-type: none"> • H2020 - (NET-Fuels) Carbon-Negative Sustainable Biofuels by Combination of Thermochemical and Bio-Electrochemical Processes • H2020 - (STAR-ProBio) Sustainability Transition Assessment and Research of Bio-based Products • EIT Food - (BTF) Black To the Future <p>Relevant publications</p> <p>Nicolas Greggio; Mattia Benamati; Diego Marazza; Andrea Contin; Nicola Labartino; Sergio Piccinini, Database of the residual biomasses in Emilia Romagna Region and relative production sites, in: Atti di Ecomondo 2017 "Green & Circular Economy" Risorse dai rifiuti: soluzioni innovative e conseguenze ambientali verso l'implementazione di un'economia circolare, in corso di stampa, pp. 1 - 1 (atti di: Ecomondo, Rimini, Mercoledì 8 Novembre 2017)</p> <p>Carlotta Carlini; Antonio Primante; Nicolas Greggio; Enrico Balugani; Andrea Contin; Diego Marazza, PO4 recovery using mixtures of biochar and carbonate materials, in: EGU General Assembly 2021, 2021, pp. 2716 – 2716</p> <p>Hornung A.; Daschner R.; Ouadi M.; Zhou J.; Lieftink D.; Grassi A.; Capaccioli S.; Contin A.; Righi S.; Marazza D.; Baioli F.; Rapone I.; Langley M.; Tuck C.; Claret A.; Bastos J., To-syn-fuel project to convert sewage sludge in value-added products, in: European Biomass Conference and Exhibition Proceedings, Firenze, ETA-Florence Renewable Energies, 2020, pp. 537 – 541</p> <p>Hornung, A.; Ouadi, M.; Galileu Speranza, L.; Apfelbacher, A.; Hornung, T.; Hofmann, M.; Hygate, J.; Hilditch, P.; Lima, S.; Lieftink, D.; Capaccioli, S.; Grassi, A.; Contin, A.; Righi, S.; Marazza, D.; Quaranta, M.; Vogli, L.; Macrelli, S.; Blakey, S.G.; Lewis, C.; Valk, M.; Tuck, C.; Langley, M.; Ott, T., Flexjet project, sustainable jet fuel from flexible waste biomass, in: 27th European Biomass Conference and Exhibition,, Firenze, ETA-Florence Renewable Energies, 2019, pp. 1 – 5</p>

	Marazza, Diego; Macrelli, Stefano; D'Angeli, Mirta; Righi, Serena; Hornung, Andreas; Contin, Andrea, Greenhouse gas savings and energy balance of sewage sludge treated through an enhanced intermediate pyrolysis screw reactor combined with a reforming process , «WASTE MANAGEMENT», 2019, 91, pp. 42 - 53
--	--

HORIZON-JU-CBE-2023-IA-02: Production of safe, sustainable, and efficient bio-based fertilisers to improve soil health and quality	
Research Group	<u>Andrea Contin</u> Department of Physics and Astronomy "Augusto Righi"
Short Bio of the Research Group	Andrea Contin is Full Professor of Applied Physics, Environmental, Political and Economic Management Systems, and Renewable Energy and Energy Management. The research group (EMRG group) The research group (EMRG group) deals with solutions for: <ul style="list-style-type: none"> • nutrients recovery from wastewater, using material deriving from advanced carbon, with a view to their possible reuse in agriculture • system analysis and models for the assessment of environmental benefits, with particular attention to negative emissions, carbon removal and the certification of carbon credits. • use of advanced carbons (funzionalized biochar) • recovery of critical raw materials • improvement of soil health • Life Cycle Thinking
Expertise in relation to the topic	Functionalization of biochar for the production of Second Generation Carbons as adsorbent materials (substitute for activated carbons): <ul style="list-style-type: none"> - treatment of urban and industrial effluents with recovery of nutrients (P and N) and critical materials - land and water remediation - improvement of agricultural soil - new functionalized carbonaceous material for water filtration and material recovery carbon sequestration and carbon credits
Relevant technologies	<ul style="list-style-type: none"> - dedicated analytical lab - laboratory for medium-high TRL - Field instrumentation for on-site testing - LCA software
Previous EU funded projects & relevant publications	<p>EU funded projects</p> <ul style="list-style-type: none"> • H2020 - (NET-Fuels) Carbon-Negative Sustainable Biofuels by Combination of Thermochemical and Bio-Electrochemical Processes • H2020 - (STAR-ProBio) Sustainability Transition Assessment and Research of Bio-based Products • EIT Food - (BTF) Black To the Future <p>Relevant Puclications</p> <p>Nicolas Greggio; Mattia Benamati; Diego Marazza; Andrea Contin; Nicola Labartino; Sergio Piccinini, Database of the residual biomasses in Emilia Romagna Region and relative production sites, in: Atti di Ecomondo 2017 "Green & Circular Economy" Risorse dai rifiuti: soluzioni innovative e conseguenze ambientali verso l'implementazione di</p>

	<p>un'economia circolare, in corso di stampa, pp. 1 - 1 (atti di: Ecomondo, Rimini, Mercoledì 8 Novembre 2017)</p> <p>Carlotta Carlini; Antonio Primante; Nicolas Greggio; Enrico Balugani; Andrea Contin; Diego Marazza, PO4 recovery using mixtures of biochar and carbonate materials, in: EGU General Assembly 2021, 2021, pp. 2716 – 2716</p> <p>Hornung A.; Daschner R.; Ouadi M.; Zhou J.; Liefink D.; Grassi A.; Capaccioli S.; Contin A.; Righi S.; Marazza D.; Baioli F.; Rapone I.; Langley M.; Tuck C.; Claret A.; Bastos J., To-syn-fuel project to convert sewage sludge in value-added products, in: European Biomass Conference and Exhibition Proceedings, Firenze, ETA-Florence Renewable Energies, 2020, pp. 537 – 541</p> <p>Hornung, A.; Ouadi, M.; Galileu Speranza, L.; Apfelbacher, A.; Hornung, T.; Hofmann, M.; Hygate, J.; Hilditch, P.; Lima, S.; Liefink, D.; Capaccioli, S.; Grassi, A.; Contin, A.; Righi, S.; Marazza, D.; Quaranta, M.; Vogli, L.; Macrelli, S.; Blakey, S.G.; Lewis, C.; Valk, M.; Tuck, C.; Langley, M.; Ott, T., Flexjet project, sustainable jet fuel from flexible waste biomass, in: 27th European Biomass Conference and Exhibition,, Firenze, ETA-Florence Renewable Energies, 2019, pp. 1 – 5</p> <p>Marazza, Diego; Macrelli, Stefano; D'Angeli, Mirta; Righi, Serena; Hornung, Andreas; Contin, Andrea, Greenhouse gas savings and energy balance of sewage sludge treated through an enhanced intermediate pyrolysis screw reactor combined with a reforming process, «WASTE MANAGEMENT», 2019, 91, pp. 42 - 53</p>
--	--

HORIZON-JU-CBE-2023-IA-03: Improve fermentation processes (including downstream purification) to final bio-based products

Research Group	<p>Lorenzo Bertin Department of Civil, Chemical, Environmental, and Materials Engineering</p>
Short Bio of the Research Group	<p>Lorenzo Bertin received his Ph.D. in Industrial Chemistry in the 2003. From 2001 to 2014 he was Assistant Professor of Organic Chemistry at the Engineering Faculty of the University of Bologna. From September 2014 he is Associated Professor in "Chemistry and Biochemistry of the Fermentations" and from March 2018 in "sanitary and environmental engineering". His main research activities focused and focus on the development of non-conventional aerobic and anaerobic biotechnological processes, mainly dedicated to the bioremediation of actual-site contaminated environmental matrices and to the bioconversion of biowaste into biogas, chemicals and biopolymers according to the biorefinery approach. He is the lead scientist of Research Units in EU and national projects. He published 63 full papers in international journals with IF and 8 book chapters. He got about 2000 citations, with a H-index of 31 (Scopus database, March 2022).</p>
Expertise in relation to the topic	<p>Development and optimization of fermentation processes mediated by mixed cultures or pure microbial cultures for the production of bio-based chemicals (e.g., hexanoic acid) or microbial biopolymers (e.g., polyhydroxyalkanoates); development of down-stream processes for the</p>

	concentration / separation of target products by solid phase extraction, liquid-liquid extraction, membrane processes.
Previous EU funded projects & relevant publications	<p>Lanfranchi A.; Tassinato G.; Valentino F.; Martinez G.A.; Jones E.; Gioia C.; Bertin L.; Cavinato C., Hydrodynamic cavitation pre-treatment of urban waste: Integration with acidogenic fermentation, PHAs synthesis and anaerobic digestion processes, «CHEMOSPHERE», 2022, 301, Article number: 134624 , pp. 1 - 9 [Scientific article]</p> <p>Samori' C.; Martinez G.A.; Bertin L.; Pagliano G.; Parodi A.; Torri C.; Galletti P., PHB into PHB: Recycling of polyhydroxybutyrate by a tandem "thermolytic distillation-microbial fermentation" process, «RESOURCES CONSERVATION AND RECYCLING», 2022, 178, Article number: 106082 , pp. 1 - 7 [Scientific article]</p> <p>Domingos J.M.B.; Martinez G.A.; Morselli E.; Bandini S.; Bertin L., Reverse osmosis and nanofiltration opportunities to concentrate multicomponent mixtures of volatile fatty acids, «SEPARATION AND PURIFICATION TECHNOLOGY», 2022, 290, Article number: 120840 , pp. 1 - 10 [Scientific article]</p> <p>Martinez G.A.; Puccio S.; Domingos J.M.B.; Morselli E.; Gioia C.; Marchese P.; Raspolli Galletti A.M.; Celli A.; Fava F.; Bertin L., Upgrading grape pomace contained ethanol into hexanoic acid, fuel additives and a sticky polyhydroxyalkanoate: an effective alternative to ethanol distillation, «GREEN CHEMISTRY», 2022, 24, pp. 2882 - 2892 [Scientific article]</p> <p>Sarah Notarfrancesco; Elena Morselli; Gonzalo A.Martinez; Weronica Harasimiuk; Joana M.B.Domingos; Andrea Negroni; Fabio Fava; Lorenzo Bertin, Improved recovery of carboxylic acids using sequential cationic-anionic adsorption steps: A highly competitive ion-equilibrium model, «SEPARATION AND PURIFICATION TECHNOLOGY», 2021, 261, Article number: 118253 , pp. 1 - 10 [Scientific article]</p>

HORIZON-JU-CBE-2023-IA-04: Recycling bio-based plastics increasing sorting and recycled content (upcycling)

Research Group	<u>Giuseppe Torluccio</u> Department of Management
Expertise in relation to the topic	<ul style="list-style-type: none"> - Comparative life cycle assessment (LCA) and social LCA (S - LCA) of recycling processes for Bio -based plastics - Research on high performance coating processes aiming to increase sorting and recycled content of plastic - Market analysis (Global, regional, national) - Sector needs analysis - Socio-economic Impact assessment - Development of new best practices based on other European or non-European countries

HORIZON-JU-CBE-2023-IA-04: Recycling bio-based plastics increasing sorting and recycled content (upcycling)

Research Group	<u>Chiara Samorì</u> , Paola Galletti, Cristian Torri Department of Chemistry "Giacomo Ciamician"
Short Bio of the Research Group	The groups of Green Chemistry and Analytical Pyrolysis are in the Ravenna campus and synergically work for developing sustainable technologies in which thermochemical, biological and chemical tools are integrated.
Expertise in relation to the topic	Development of lab-scale protocols for chemically recycling starch-based plastics by using i) pyrolysis, ii) chemical depolymerization or iii) solvent dissolution and precipitation. Development of lab-scale protocols for recycling polyhydroxyalkanoates through the integration of chemical and biological processes.
Relevant technologies	Lab scale pyrolyzer Lab scale chemical equipment
Previous EU funded projects & relevant publications	"MERLIN - Increasing the quality and rate of MultilayER packaging recycLING waste", Horizon 2020. Overall funding 5 M€. Role: partner Recycling of post-use starch-based plastic bags through pyrolysis to produce sulfonated catalysts and chemicals. Journal of Analytical and Applied Pyrolysis, 2021, 155,105030 Recycling of multilayer packaging waste with sustainable solvents. Resources, Conservation and Recycling, 2023, 190,106832 PHB into PHB: Recycling of polyhydroxybutyrate by a tandem "thermolytic distillation-microbial fermentation" process. Resources, Conservation and Recycling, 2022, 178,106082 Chemical Recycling of Polyhydroxybutyrate (PHB) into Bio-Based Solvents and Their Use in a Circular PHB Extraction. ACS Sustainable Chemistry and Engineering, 2021, 9(37), pp. 12575-12583

HORIZON-JU-CBE-2023-IA-05: Development of scalable, safe bio-based surfactants, with an improved sustainability profile

Research Group	<u>Fabrizio Passarini</u> , Daniele Cespi Department of Industrial Chemistry "Toso Montanari"
Short Bio of the Research Group	The research group in environmental and cultural heritage chemistry is settled in Bologna and Rimini. The main research fields of our group include: physical-chemical characterization of waste streams and residues, their management and treatment for potential valorization; environmental sustainability assessment of product-systems and industrial processes through a life cycle approach; material flow analysis applied to the characterization of anthropogenic cycle of resources, their reserves in use and to analyze future scenarios of material supply; analysis of the criticality of resources; environmental monitoring activities; analysis of the effects of environment and pollutants on traditional and modern materials for artistic, architectural and industrial applications.

Expertise in relation to the topic	Expertise in - Life Cycle Assessment (LCA) of different bio-based products - Use of sustainability indicators to assess chemical processes at both industrial and early design stage - Environmental footprint of products/processes/systems, such as carbon footprint and water footprint - Assessing the human and ecotoxicity of products and systems through LCA methodology - Assessing environmental sustainability of different biomasses sources through LCA approach - Material Flow Analysis (MFA) of material and resources
Relevant technologies	<ul style="list-style-type: none"> - LCA software - LCI databases - MFA software
Previous EU funded projects & relevant publications	<p>Projects</p> <ul style="list-style-type: none"> - From 2018 to 2021, TSS2018B_3310-BPLAS_A B-PLAS "PLAS DEMO: Industrial demonstration of sludge to bioplastic pathway". - From 1/1/2020, Horizon 2020 Research and Innovation Staff Exchange (RISE) (Call: H2020-MSCA-RISE-2019, Topic: MSCA-RISE-2019 Type of action: MSCA-RISE). - From 1/09/2022, CL5-2021-D2-01 (Agreement ID: 1010696990) "STORMING – Structured unconventional reactors for CO₂-free Methane catalytic cracking". - From 1/09/2022, LIFE 21-ENV-IT-CROSS-LIFE project (n. 101074164) "CROSS – CROtonic acid from Sewage Sludge". <p>Publications</p> <p>M. Volanti, D. Cespi, F. Passarini, E. Neri, F. Cavani, P. Mizsey, D. Fozzer, Terephthalic acid from renewable sources: early-stage sustainability analysis of a bio-PET precursor, «GREEN CHEMISTRY», 2019, 21, pp. 885 - 896</p> <p>Cespi, D.; Cucciniello, R.; Ricciardi, M.; Capacchione, C.; Vassura, I.; Passarini, F.; Proto, A., A simplified early stage assessment of process intensification: Glycidol as a value-added product from epichlorohydrin industry wastes, «GREEN CHEMISTRY», 2016, 18, pp. 4559 – 4570</p> <p>Cespi, D.; Passarini, F.; Vassura, I.; Cavani, F., Butadiene from biomass, a life cycle perspective to address sustainability in the chemical industry, «GREEN CHEMISTRY», 2016, 18, pp. 1625 – 1638</p> <p>Cespi, D.; Passarini, F.; Mastragostino, G.; Vassura, I.; Larocca, S.; Iaconi, A.; Chiericato, A.; Dubois, J.-L.; Cavani, F., Glycerol as feedstock in the synthesis of chemicals: A life cycle analysis for acrolein production, «GREEN CHEMISTRY», 2015, 17, pp. 343 – 355</p> <p>Cespi D.; Esposito I.; Cucciniello R.; Anastas P.T., Beyond the beaker: benign by design society, «CURRENT RESEARCH IN GREEN AND SUSTAINABLE CHEMISTRY», 2020, 3, pp. 100028 – 100029</p>

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks

Research Group	<u>Daniele Cespi, Fabrizio Passarini</u> Department of Industrial Chemistry "Toso Montanari"
Short Bio of the Research Group	<p>The research group in environmental and cultural heritage chemistry is settled in Bologna and Rimini. The main research fields of our group include: physical-chemical characterization of waste streams and residues, their management and treatment for potential valorization; environmental sustainability assessment of product-systems and industrial processes through a life cycle approach; material flow analysis applied to the characterization of anthropogenic cycle of resources, their reserves in use and to analyze future scenarios of material supply; analysis of the criticality of resources; environmental monitoring activities; analysis of the effects of environment and pollutants on traditional and modern materials for artistic, architectural and industrial applications.</p>
Expertise in relation to the topic	<p>Expertise in</p> <ul style="list-style-type: none"> - Life Cycle Assessment (LCA) of different bio-based products and comparison with fossil-based chemicals - Use of sustainability indicators to assess chemical processes at both industrial and early design stage - Environmental footprint of products/processes/systems, such as carbon footprint and water footprint - Assessing environmental sustainability of different biomass sources through LCA approach - Material Flow Analysis (MFA) of material and resources
Relevant technologies	<ul style="list-style-type: none"> - LCA software - LCI databases - MFA software
Previous EU funded projects & relevant publications	<p>Projects</p> <ul style="list-style-type: none"> - From 2018 to 2021, TSS2018B_3310-BPLAS_A B-PLAS "PLAS DEMO: Industrial demonstration of sludge to bioplastic pathway". - From 1/1/2020, Horizon 2020 Research and Innovation Staff Exchange (RISE) (Call: H2020-MSCA-RISE-2019, Topic: MSCA-RISE-2019 Type of action: MSCA-RISE). - From 1/09/2022, CL5-2021-D2-01 (Agreement ID: 1010696990) "STORMING – Structured unconventional reactors for CO₂-free Methane catalytic cracking". - From 1/09/2022, LIFE 21-ENV-IT-CROSS-LIFE project (n. 101074164) "CROSS – CROtonic acid from Sewage Sludge". <p>Publications</p> <p>Ciacci, Luca; de Matos, Cristina T.; Reck, Barbara K.; Wittmer, Dominic; Bernardi, Elena; Mathieux, Fabrice; Passarini, Fabrizio, Material system analysis: Characterization of flows, stocks, and performance indicators of manganese, nickel, and natural graphite in the EU, 2012–2016, «JOURNAL OF INDUSTRIAL ECOLOGY», 2022, 2022, pp. 1 - 14</p> <p>M. Volanti, D. Cespi, F. Passarini, E. Neri, F. Cavani, P. Mizsey, D. Fozzer, <i>Terephthalic acid from renewable sources: early-stage sustainability</i></p>

	<p>analysis of a bio-PET precursor, «GREEN CHEMISTRY», 2019, 21, pp. 885 - 896</p> <p>Tripodi, Antonio; Bahadori, Elnaz; Cespi, Daniele; Passarini, Fabrizio; Cavani, Fabrizio; Tabanelli, Tommaso; Rossetti, Ilenia*, Acetonitrile from Bioethanol Ammoxidation: Process Design from the Grass-Roots and Life Cycle Analysis, «ACS SUSTAINABLE CHEMISTRY & ENGINEERING», 2018, 6, pp. 5441 - 5451</p> <p>Cespi, D.; Cucciniello, R.; Ricciardi, M.; Capacchione, C.; Vassura, I.; Passarini, F.; Proto, A., <i>A simplified early stage assessment of process intensification: Glycidol as a value-added product from epichlorohydrin industry wastes</i>, «GREEN CHEMISTRY», 2016, 18, pp. 4559 – 4570</p> <p>Cespi, D.; Passarini, F.; Vassura, I.; Cavani, F., <i>Butadiene from biomass, a life cycle perspective to address sustainability in the chemical industry</i>, «GREEN CHEMISTRY», 2016, 18, pp. 1625 – 1638</p> <p>Cespi, D; Passarini, F.; Mastragostino, G.; Vassura, I.; Larocca, S.; Iaconi, A.; Chierigato, A.; Dubois, J.-L.; Cavani, F., <i>Glycerol as feedstock in the synthesis of chemicals: A life cycle analysis for acrolein production</i>, «GREEN CHEMISTRY», 2015, 17, pp. 343 - 355</p>
--	---

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks

Research Group	<p><u>Lorenzo Bertin</u> Department of Civil, Chemical, Environmental, and Materials Engineering</p>
Short Bio of the Research Group	<p>Lorenzo Bertin received his Ph.D. in Industrial Chemistry in the 2003. From 2001 to 2014 he was Assistant Professor of Organic Chemistry at the Engineering Faculty of the University of Bologna. From September 2014 he is Associated Professor in "Chemistry and Biochemistry of the Fermentations" and from March 2018 in "sanitary and environmental engineering". His main research activities focused and focus on the development of non-conventional aerobic and anaerobic biotechnological processes, mainly dedicated to the bioremediation of actual-site contaminated environmental matrices and to the bioconversion of biowaste into biogas, chemicals and biopolymers according to the biorefinery approach. He is the lead scientist of Research Units in EU and national projects. He published 63 full papers in international journals with IF and 8 book chapters. He got about 2000 citations, with a H-index of 31 (Scopus database, March 2022).</p>
Expertise in relation to the topic	<p>Development of biorefinery scheme fed by organic waste for the a) recovery of added-value molecules (e.g., polyphenols), b) production of small chain-fatty acids (among which, hexanoic acid) and polyhydroxyalkanoates (among which, polyhydroxyhexanoate, amorphous), production of biogas by anaerobic fermentation.</p>
Previous EU funded projects & relevant	<p>Lanfranchi A.; Tassinato G.; Valentino F.; Martinez G.A.; Jones E.; Gioia C.; Bertin L.; Cavinato C., Hydrodynamic cavitation pre-treatment of urban waste: Integration with acidogenic fermentation, PHAs synthesis and</p>

publications	<p>anaerobic digestion processes, «CHEMOSPHERE», 2022, 301, Article number: 134624 , pp. 1 - 9 [Scientific article]</p> <p>Samori' C.; Martinez G.A.; Bertin L.; Pagliano G.; Parodi A.; Torri C.; Galletti P., PHB into PHB: Recycling of polyhydroxybutyrate by a tandem "thermolytic distillation-microbial fermentation" process, «RESOURCES CONSERVATION AND RECYCLING», 2022, 178, Article number: 106082 , pp. 1 - 7 [Scientific article]</p> <p>Domingos J.M.B.; Martinez G.A.; Morselli E.; Bandini S.; Bertin L., Reverse osmosis and nanofiltration opportunities to concentrate multicomponent mixtures of volatile fatty acids, «SEPARATION AND PURIFICATION TECHNOLOGY», 2022, 290, Article number: 120840 , pp. 1 - 10 [Scientific article]</p> <p>Martinez G.A.; Puccio S.; Domingos J.M.B.; Morselli E.; Gioia C.; Marchese P.; Raspolli Galletti A.M.; Celli A.; Fava F.; Bertin L., Upgrading grape pomace contained ethanol into hexanoic acid, fuel additives and a sticky polyhydroxyalkanoate: an effective alternative to ethanol distillation, «GREEN CHEMISTRY», 2022, 24, pp. 2882 - 2892 [Scientific article]</p> <p>Sarah Notarfrancesco; Elena Morselli; Gonzalo A.Martinez; Weronica Harasimiuk; Joana M.B.Domingos; Andrea Negroni; Fabio Fava; Lorenzo Bertin, Improved recovery of carboxylic acids using sequential cationic-anionic adsorption steps: A highly competitive ion-equilibrium model, «SEPARATION AND PURIFICATION TECHNOLOGY», 2021, 261, Article number: 118253 , pp. 1 - 10 [Scientific article]</p>
---------------------	---

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks	
Research Group	Chiara Samorì, Paola Galletti, Cristian Torri Department of Chemistry "Giacomo Ciamician"
Short Bio of the Research Group	The groups of Green Chemistry and Analytical Pyrolysis are in the Ravenna campus and synergically work for developing sustainable technologies in which thermochemical, biological and chemical tools are integrated.
Expertise in relation to the topic	Expertise in converting wastewater treatment sludge (WWTS) into polyhydroxyalkanoates (PHA), biopolymers exploitable in the bioplastic market, and drop-in alkenoic acids (i.e. crotonic acid), exploitable as platform chemicals for the same applications of fossil-based alkenoic acids
Relevant technologies	Realization of two DEMO-plants (TRL 7) for treating urban and industrial WWTS and producing crotonic acid. CROSS-LIFE project (2022-2026)
Previous EU funded projects & relevant	BPLAS DEMO Bioplastics from sludge, EIT Climate-KIC. 2018-2021, Overall funding 1 M€. Role: Coordinator

publications	<p>CROSS-LIFE project CROtonic acid from Sewage Sludge, LIFE-2021-SAP-ENV", LIFE Programme. 2022-2026, Overall funding 4.8 M€. Role: Coordinator</p> <p>Bio-based crotonic acid from polyhydroxybutyrate: synthesis and photocatalyzed hydroacylation. <i>Green Chemistry</i>, 2021, 23(9), pp. 3420-3427</p> <p>Polyhydroxyalkanoates and Crotonic Acid from Anaerobically Digested Sewage Sludge. <i>ACS Sustainable Chemistry and Engineering</i>, 2019, 7(12), pp. 10266-10273</p>
---------------------	--

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks

Research Group	<p><u>Rita Mazzoni</u> Department of Industrial Chemistry "Toso Montanari"</p>
Short Bio of the Research Group	Design of molecular catalysts for sustainable applications
Expertise in relation to the topic	<p>Design and decoration of organometallic complexes for homogeneous and hybrid catalysis applied to sustainability. Design of organometallic complexes (groups VII-X) for the catalytic transformation of biomass derived platforms. Bifunctional well defined catalysts (mainly Ru and earth abundant Fe based) can be designed in order to work in solution as homogeneous catalysts or as a decoration of insoluble supports for heterogeneous single site or hybrid catalysis. Among the catalytic transformations available, hydrogen transfer and hydrolysis are applied to bio-based compounds (<i>ChemSusChem</i>, 2022, 15, 1-18; <i>Appl. Catal. B, Env.</i>, 2016, 180, 38-43). Hydrogen borrowing enables greener synthetic routes from bio-alcohols (e.g. Guerbet reaction <i>J. Catal.</i> 2022, 405, 47-59, <i>ACS Sust. Chem. Eng.</i> 2019, 7, 224-237). Experties are also available in hydroformilation, olefin methathesis, hydrogen production and water oxidation. Research on biomass valorization is developed in close cooperation with the "Catalysis for Renewable and Innovative Processes" group headed by Prof. Fabrizio Cavani (same Department).</p>
Relevant technologies	Schlenck technique for the synthesis under strict inert conditions. Schlenck designed small reactors and autoclaves for catalysis under pressure. GC, GC-MS, IR, UV-Vis, NMR, ESI-MS facilities.
Previous EU funded projects & relevant publications	<p>Patent: Improved process for the transformation of primary aliphatic alcohols into higher aliphatic alcohols (WO 2019/193079 A1) University of Bologna;</p> <p>Project: H2020 FIRST2RUN G.A. nr. 669029 Flagship demonstration of an integrated biorefinery for dry crops sustainable exploitation toward biobased materials production.</p>

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks

Research Group	<u>Tommaso Tabanelli</u> Department of Industrial Chemistry "Toso Montanari"
Expertise in relation to the topic	The "Catalysis for Renewable and Innovative Processes" group has a long-lasting experience in the field of catalysis, in the design of innovative materials and in the development of alternative catalytic processes, especially from renewables and waste from agro and food industry, for chemicals and fuels synthesis. Group website: https://site.unibo.it/catalysis-for-renewables-and-innovative-processes/en
Previous EU funded projects & relevant publications	Alternative process for MMA production. Tabanelli et al. ACS Sustainable Chem. Eng. 2021, 9, 4, 1790-1803. Alternative isocyanate-free routes to polyureas and polyurethane. Tabanelli et al. Polymer 267 (2023) 125641. M. Soccio et al. ACS Sustainable Chemistry and Engineering, 2020, 8(41), 15640-15650. Alternative valorisation routes for levulinic acid and relative esters: Tabanelli et al. Sustainable Energy Fuels, 2023, Advance Article. https://doi.org/10.1039/D2SE01583H ; ACS Sustainable Chem. Eng. 2019, 7, 9937-9947; ACS Sustainable Chem. Eng. 2019, 7, 8317-8330. Ethanol catalytic upgrading i.e. toward sustainable aviation fuels or higher alcohols: T. Tabanelli, et al. "Production of jet fuel from C2-C4 bioalcohols". Application number: IT patent 102022000003209, 2022. Journal of Catalysis 405 (2022) 47-59. Innovative fractionation processes of 2nd generation lignocellulosic biomass: T. Tabanelli, et al. "Magnetic catalyst for the reductive catalytic fractionation of lignocellulosic biomass". Application number: IT patent 102021000005024, 2021. Vegetable oil valorisation: ketonisation of bio-based acids Sustain. Chem. 2022, 3, 58-75; oxidative cleavage processes: ChemSusChem 2021, 14, 2375-2382 Organic carbonates (e.g. glycerol carbonate): ACS Sustainable Chem. Eng. 2022, 10, 10922-10933. FIRST2RUN European Commission/BBI. Grant Agreement No: 669029-H2020-BBI-PPP-2014-1 "Flagship demonstration of an Integrated bioRefinery for dry crops Sustainable exploitation Towards biobased materials pRodUction".

HORIZON-JU-CBE-2023-IA-07: High performance, circular-by design, biobased composites

Research Group	<u>Daniele Cespi, Fabrizio Passarini</u> Department of Industrial Chemistry "Toso Montanari"
Short Bio of the Research Group	The research group in environmental and cultural heritage chemistry is settled in Bologna and Rimini. The main research fields of our group include: physical-chemical characterization of waste streams and residues, their management and treatment for potential valorization; environmental sustainability assessment of product-systems and industrial processes through a life cycle approach; material flow analysis applied to the characterization of anthropogenic cycle of resources, their reserves in use and to analyze future scenarios of material supply; analysis of the criticality of resources; environmental monitoring activities; analysis of the

	effects of environment and pollutants on traditional and modern materials for artistic, architectural and industrial applications.
Expertise in relation to the topic	Expertise in <ul style="list-style-type: none"> - Life Cycle Assessment (LCA) of different bio-based products and comparison with fossil-based chemicals - Use of sustainability indicators to assess chemical processes at both industrial and early design stage - Assessing the environmental sustainability of composites materials, including EoL technologies/strategies - Environmental footprint of products/processes/systems, such as carbon footprint and water footprint
Relevant technologies	<ul style="list-style-type: none"> - LCA software - LCI databases - MFA software
Previous EU funded projects & relevant publications	<p>Projects:</p> <ul style="list-style-type: none"> - From 2018 to 2021, TSS2018B_3310-BPLAS_A B-PLAS "PLAS DEMO: Industrial demonstration of sludge to bioplastic pathway". - From 1/1/2020, Horizon 2020 Research and Innovation Staff Exchange (RISE) (Call: H2020-MSCA-RISE-2019, Topic: MSCA-RISE-2019 Type of action: MSCA-RISE). - From 1/09/2022, CL5-2021-D2-01 (Agreement ID: 1010696990) "STORMING – Structured unconventional reactors for CO₂-free Methane catalytic cracking". - From 1/09/2022, LIFE 21-ENV-IT-CROSS-LIFE project (n. 101074164) "CROSS – CROtonic acid from Sewage Sludge". <p>Publications:</p> <p>Ciacci L.; Zattini G.; Tosi C.; Berti B.; Passarini F.; Giorgini L., Carbon Fibers Waste Recovery via Pyro-Gasification: Semi-Industrial Pilot Plant Testing and LCA, «SUSTAINABILITY», 2022, 14, Article number: 3744, pp. 1 - 16</p>

HORIZON-JU-CBE-2023-IAFlag-01: Optimised and integrated forest-based value chains

Research Group	<u>Valentino Marini Govigli</u> Department of Department of Agricultural and Food Sciences
Short Bio of the Research Group	Valentino Marini Govigli is Junior assistant professor (fixed term) at the Department of Agri-Food Sciences and Technologies, University of Bologna (Italy). He holds a PhD in Forest and Cultural ecology, a MRes in Ecology and Environmental Management, and a BAE in Economics. His fields of expertise are socioeconomics of agro-forest goods and services, consumer behaviour and stakeholder preferences, intangible ecosystem services assessment, social innovation brokerage and multi-actor engagement. Valentino has more than eight year of experience in applied agro-forestry research. Currently he works in the H2020 Project FOODLAND and LOWINFOOD, exploring best practices for food nutrition

	and sustainable farming in African food value chains through behavioural and experimental economics.
Expertise in relation to the topic	Forest economics; economic valuations; stakeholder engagement; forest policy analysis; Forest owners' behavioural studies; participatory methods and facilitations of forest-based conflicts around resources.
Previous EU funded projects & relevant publications	Jeanne-Lazya Roux, Agata A. Konczal, Andreas Bernasconi, Shonil A. Bhagwat, Rik De Vreese, Ilaria Doimo, Valentino Marini Govigli, Jan Kašpar, Ryo Kohsaka, Davide Pettenella, Tobias Plieninger, Zahed Shakeri, Shingo Shibata, Kalliopi Stara, Takuya Takahashi, Mario Torralba, Liisa Tyrväinen, Gerhard Weiss, Georg Winkel, Exploring evolving spiritual values of forests in Europe and Asia: a transition hypothesis toward re-spiritualizing forests , «ECOLOGY & SOCIETY», 2022, 27, Article number: 20 , pp. 1 - 20

HORIZON-JU-CBE-2023-IAFlag-02: Expansion and/or retro-fitting of biorefineries towards higher-value bio-based chemicals and intermediates

Research Group	<u>Laura Pezzolesi</u> Department of Biological, Geological, and Environmental Sciences
Expertise in relation to the topic	<p>The Algal Biology Laboratory (Ravenna campus) carries out studies on microalgae using strains isolated from the environment and cultured in the laboratory.</p> <p>The Laboratory, in collaboration with the laboratory of Sustainable Chemistry, deals with microalgae useful for human health and for the extraction of biomolecules with high added values, applicable in several industrial sectors, in line with the Blue Growth themes. Studies could be performed also for wastewater bioremediation processes or using waste/industrial CO₂ for algal culturing, in collaboration with companies. The laboratory is specialized in the cultivation of microalgae and optimization of the growth to obtain high-quality biomass or high-value products (e.g., biopolymer PHB, carotenoids, fatty acids, proteins) with different applications (e.g. food, feed, pharmaceutical, and cosmetics). Different species of cyanobacteria and marine or freshwater algae are present in the algal collection of the laboratory and could be cultivated.</p>

HORIZON-JU-CBE-2023-IAFlag-03: Bio-based packaging materials with improved properties: barrier, food contact, forming, printability, safety, recyclability /circularity-by-design

Research Group	<u>Giuseppe Torluccio</u> Department of Management
Expertise in relation to the topic	<ul style="list-style-type: none"> - Comparative life cycle assessment (LCA) and social LCA (S - LCA) of packaging materials and related processes - Research on high performance coating for packaging materials (improved recyclability, plastic-use reduction) - Market analysis (Global, regional, national) - Sector needs analysis

	<ul style="list-style-type: none"> - Socio-economic Impact assessment - Development of new best practices based on other European or non-European countries
--	---

HORIZON-JU-CBE-2023-IAFlag-03: Bio-based packaging materials with improved properties: barrier, food contact, forming, printability, safety, recyclability /circularity-by-design

Research Group	<u>Daniele Cespi, Fabrizio Passarini</u> Department of Industrial Chemistry "Toso Montanari"
Short Bio of the Research Group	<p>The research group in environmental and cultural heritage chemistry is settled in Bologna and Rimini. The main research fields of our group include: physical-chemical characterization of waste streams and residues, their management and treatment for potential valorization; environmental sustainability assessment of product-systems and industrial processes through a life cycle approach; material flow analysis applied to the characterization of anthropogenic cycle of resources, their reserves in use and to analyze future scenarios of material supply; analysis of the criticality of resources; environmental monitoring activities; analysis of the effects of environment and pollutants on traditional and modern materials for artistic, architectural and industrial applications.</p>
Expertise in relation to the topic	<p>Expertise in:</p> <ul style="list-style-type: none"> - Life Cycle Assessment (LCA) of different bio-based products - Use of sustainability indicators to assess chemical processes at both industrial and early design stage - Environmental footprint of products/processes/systems, such as carbon footprint and water footprint - Assessing the environmental and cost sustainability of technologies for EoL food packaging
Relevant technologies	<ul style="list-style-type: none"> - LCA software - LCI databases - MFA software
Previous EU funded projects & relevant publications	<p>Projects</p> <ul style="list-style-type: none"> - From 2018 to 2021, TSS2018B_3310-BPLAS_A B-PLAS "PLAS DEMO: Industrial demonstration of sludge to bioplastic pathway". - From 1/1/2020, Horizon 2020 Research and Innovation Staff Exchange (RISE) (Call: H2020-MSCA-RISE-2019, Topic: MSCA-RISE-2019 Type of action: MSCA-RISE). - From 1/09/2022, CL5-2021-D2-01 (Agreement ID: 1010696990) "STORMING – Structured unconventional reactors for CO₂-free Methane catalytic cracking". - From 1/09/2022, LIFE 21-ENV-IT-CROSS-LIFE project (n. 101074164) "CROSS – CROtonic acid from Sewage Sludge". <p>Publications</p> <p>M. Volanti, D. Cespi, F. Passarini, E. Neri, F. Cavani, P. Mizsey, D. Fozzer, <i>Terephthalic acid from renewable sources: early-stage sustainability</i></p>

	<p>analysis of a bio-PET precursor, «GREEN CHEMISTRY», 2019, 21, pp. 885 – 896.</p> <p>Samorì, Chiara; Cespi, Daniele; Blair, Paola; Galletti, Paola; Malferrari, Danilo; Passarini, Fabrizio; Vassura, Ivano; Tagliavini, Emilio, Application of switchable hydrophilicity solvents for recycling multilayer packaging materials, «GREEN CHEMISTRY», 2017, 19, pp. 1714 – 1720</p> <p>Cespi, D.; Passarini, F.; Vassura, I.; Cavani, F., <i>Butadiene from biomass, a life cycle perspective to address sustainability in the chemical industry</i>, «GREEN CHEMISTRY», 2016, 18, pp. 1625 – 1638.</p>
--	---

HORIZON-JU-CBE-2023-IAFlag-03: Bio-based packaging materials with improved properties: barrier, food contact, forming, printability, safety, recyclability /circularity-by-design

Research Group	<u>Tullia Gallina Toschi, Alessandra Bendini, Enrico Valli</u> Department of Agricultural and Food Sciences
Short Bio of the Research Group	The research group of Chemistry, Instrumental and Sensory Analyses is concerned with developing and applying conventional as well as innovative, instrumental and sensory analyses for the evaluation of quality, authenticity and characterization of food products.
Expertise in relation to the topic	Among the expertise of the research group, those related to the sensory analysis of food products could be applied in the context of this topic. In particular, the research group is involved in the sensory descriptive analyses as well as in the evaluation of the consumers' perception of foods, as well as consumers' liking and acceptability, also during the shelf-life and in relation to different packaging materials. The research group has the facilities to perform sensory studies, i.e. three sensory laboratories equipped with 8 sensory booths, each with dedicated software to perform the tests (Fizz Biosystemes), as well as specific areas for the preparation of the samples. Moreover, the research group has a high level of expertise on the qualitative and quantitative determination of volatile and phenolic compounds in foods, assessing their changes during shelf-life, even in relation to different packaging. The research group has the facilities to perform these determinations, i.e. gas chromatography coupled with mass spectrometry, electronic nose, liquid chromatography coupled with diode array or mass spectrometry detectors. Finally, the research group also has competences on the image analysis, in particular using the electronic eye, which could be used to determine changes in visual attributes (such as color) of different packaging solutions and/or during the shelf-life.
Relevant technologies	Three sensory laboratories equipped with 8 sensory booths, each with dedicated software to perform the tests (Fizz Biosystemes), as well as specific areas for the preparation of the samples. Liquid chromatography (UHPLC-DAD, HPLC-UV, HPLC-QqQ), gas chromatography (SPME-GC-MS) and electronic nose. Electronic eye (IRIS).
Previous EU funded	Relevant Projects:

projects & relevant publications	<ul style="list-style-type: none"> • H2020 INTAQT-INnovative Tools for Assessment and Authentication of chicken meat, beef and dairy products' Qualities (GA 101000250, 2021-2026) • H2020 OLEUM-Advanced solutions for assuring the overall authenticity and quality of olive oil (GA 635690, 2016-2021) • European project ECROPOLIS "Organic Sensory Information System (OSIS): Documentation of sensory properties through testing and consumer research for the organic industry" (GA 218477-2, 2009-2011). <p>Relevant publications:</p> <ul style="list-style-type: none"> • Valli, E., Tesini, F., Tura, M., Soglia, F., Petracchi, M., Bendini, A., & Gallina Toschi, T. (2022). Instrumental and Sensory Analyses of Salami from Autochthonous and Conventional Pig Breeds. <i>Foods</i>, 11(14), 2060. • Cevoli, C., Casadei, E., Valli, E., Fabbri, A., Toschi, T. G., & Bendini, A. (2022). Storage time of nut spreads using flash gas chromatography E-nose combined with multivariate data analysis. <i>LWT</i>, 159, 113217. • Casadei, E., Valli, E., Aparicio-Ruiz, R., Ortiz-Romero, C., García-González, D. L., Vichi, S., ... & Toschi, T. G. (2021). Peer inter-laboratory validation study of a harmonized SPME-GC-FID method for the analysis of selected volatile compounds in virgin olive oils. <i>Food Control</i>, 123, 107823. • Barbieri, S., Bendini, A., Balestra, F., Palagano, R., Rocculi, P., & Gallina Toschi, T. (2018). Sensory and instrumental study of Taralli, a typical Italian bakery product. <i>European Food Research and Technology</i>, 244, 73-82. • Barbieri, S., Soglia, F., Palagano, R., Tesini, F., Bendini, A., Petracchi, M., Cavani, C., & Toschi, T. G. (2016). Sensory and rapid instrumental methods as a combined tool for quality control of cooked ham. <i>Heliyon</i>, 2(11), e00202.
---	--

HORIZON-JU-CBE-2023-IAFlag-04: Valorisation of aquatic biomass waste and residues	
Research Group	Silvana Hrelia, Cristina Angeloni, Marco Malaguti Department of Department for Life Quality Studies
Short Bio of the Research Group	Silvana Hrelia (Full Professor), Cristina Angeloni (Associate Professor), and Marco Malaguti (Associate Professor) are fully involved in Biochemical researches, carrying out projects regarding the cellular and molecular activities of bioactive molecules present in agri-food waste, biomass waste and by-products for nutraceutical or cosmeceutical applications
Expertise in relation to the topic	Expertise in validation of green chemistry, low impact processes for the valorisation and conversion of agro-food wastes, biomass waste and by-products, and residues for innovative high-value materials and products for the nutraceutical and nutritional supplement industry to protect human health and prevent chronic/degenerative diseases.
Relevant technologies	The Laboratoris have equipped for the growth of cell cultures (laminar flow hoods, thermostatic incubators), instrumentation for molecular

	<p>biology techniques (PCR, real-time PCR, gel electrophoresis systems) and for performing cellular biological tests (western blot, spectrophotometers, spectrofluorometers and luminometers for microplates, fluorescence/UV microscope and inverted microscope). In the labs, there are chemical hoods, separative pre-analytical and analytical instrumentation (SPE extraction systems, HPLC-UV/Vis and HPLC-MS).</p>
<p>Previous EU funded projects & relevant publications</p>	<p>Relevant Projects:</p> <ul style="list-style-type: none"> • FPVII Bacchus - Beneficial effects of dietary bioactive peptides and polyphenols on cardiovascular health in humans • Horizon 2020- FOODstars-Innovative Food Product Development Cycle: Frame for Stepping Up Research Excellence of FINS • FPVII RISTOMED-New E-Services for a dietary approach to the elderly • AFM-TELETHON -An integrated pharmacological/antioxidant approach for • Duchenne Muscular Dystrophy: acid sphingomyelinase as new therapeutic target • ERASMUS+ KA202 - Strategic Partnerships for vocational education and training- Project "European Network in Nutritional Education for Acquired Disabilities- ENNEADI <p>Relevant publications:</p> <p>Antioxidant and Anti-Inflammatory Profiles of Spent Coffee Ground Extracts for the Treatment of Neurodegeneration. Angeloni S, Freschi M, Marrazzo P, Hrelia S, Beghelli D, Juan-García A, Juan C, Caprioli G, Sagratini G, Angeloni C. <i>Oxid Med Cell Longev</i>. 2021;2021:6620913</p> <p>Leaves and Spiny Burs of <i>Castanea Sativa</i> from an Experimental Chestnut Grove: Metabolomic Analysis and Anti-Neuroinflammatory Activity. Chiocchio I, Prata C, Mandrone M, Ricciardiello F, Marrazzo P, Tomasi P, Angeloni C, Fiorentini D, Malaguti M, Poli F, Hrelia S. <i>Metabolites</i>. 2020;10(10):408.</p> <p>Coffee silverskin extracts: Quantification of 30 bioactive compounds by a new HPLC-MS/MS method and evaluation of their antioxidant and antibacterial activities. Nzekoue FK, Angeloni S, Navarini L, Angeloni C, Freschi M, Hrelia S, Vitali LA, Sagratini G, Vittori S, Caprioli G. <i>Food Res Int</i>. 2020 ;133:109128.</p> <p><u>Agri-Food Waste from Apple, Pear, and Sugar Beet as a Source of Protective Bioactive Molecules for Endothelial Dysfunction and Its Major Complications.</u> Caliceti C, Malaguti M, Marracino L, Barbalace MC, Rizzo P, Hrelia S. <i>Antioxidants (Basel)</i>. 2022 Sep 10;11(9):1786.</p> <p><u>Mechanisms Underlying Neurodegenerative Disorders and Potential Neuroprotective Activity of Agrifood By-Products.</u></p>

Angeloni C, Malaguti M, Prata C, Freschi M, Barbalace MC, Hrelia S. Antioxidants (Basel). 2022 Dec 30;12(1):94.

HORIZON-JU-CBE-2023-IAFlag-04: Valorisation of aquatic biomass waste and residues

Research Group	<u>Tullia Gallina Toschi, Alessandra Bendini, Enrico Valli</u> Department of Agricultural and Food Sciences
Short Bio of the Research Group	The research group of Chemistry, Instrumental and Sensory Analyses is concerned with developing and applying conventional as well as innovative, instrumental and sensory analyses for the evaluation of quality, authenticity and characterization of food products. Moreover, the research group is also concerned with the extraction of bioactive compounds from different edible oils and from agri-food industry by-products, both from vegetable and animal sources.
Expertise in relation to the topic	The research group has the facilities to extract bioactive compounds from different matrices, in particular two vacuum distillers, as well as to extract oils, such as Soxhlet. The research group is also involved in the sensory descriptive analyses (such as Quantitative Descriptive analysis and rapid descriptive methods) as well as in the evaluation of the consumers' perception, acceptability and liking of foods. The research group has the facilities to perform sensory studies, i.e. three sensory laboratories equipped with 8 sensory booths, each with dedicated software to perform the tests (Fizz Byosystemes), as well as specific areas for the preparation of the samples.
Relevant technologies	2 vacuum distillers, Soxhlet, SFE-CO ₂ . Three sensory laboratories equipped with 8 sensory booths, each with dedicated software to perform the tests (Fizz Byosystemes), as well as specific areas for the preparation of the samples.
Previous EU funded projects & relevant publications	<p>Relevant Projects:</p> <ul style="list-style-type: none"> • H2020 FOODLAND- FOOD and Local, Agricultural, and Nutritional Diversity (GA 862802, 2020-2024) • H2020 INTAQT-INnovative Tools for Assessment and Authentication of chicken meat, beef and dairy products' Qualities (GA 101000250, 2021-2026) • European project ECROPOLIS "Organic Sensory Information System (OSIS): Documentation of sensory properties through testing and consumer research for the organic industry" (GA 218477-2, 2009-2011). <p>Relevant publications:</p> <ul style="list-style-type: none"> • Tura, M.; Mandrioli, M.; Valli, E.; Dinnella, C.; Gallina Toschi, T. Sensory Wheel and Lexicon for the Description of Cold-Pressed Hemp Seed Oil. <i>Foods</i> 2023, 12, 661. • Dinnella, C., Pierguidi, L., Spinelli, S., Borgogno, M., Gallina Toschi, T., Predieri, S., Lavezzi, G., Trapani, F., Tura, M., Magli, M., Bendini, A., & Monteleone, E. (2022). Remote testing: Sensory test during Covid-19 pandemic and beyond. <i>Food quality and preference</i>, 96, 104437.

	<ul style="list-style-type: none"> • Barbieri, S., Bendini, A., Balestra, F., Palagano, R., Rocculi, P., & Gallina Toschi, T. (2018). Sensory and instrumental study of Taralli, a typical Italian bakery product. <i>European Food Research and Technology</i>, 244, 73-82. • Gallina Toschi, T., Bendini, A., Barbieri, S., Valli, E., Cezanne, M. L., Buchecker, K., & Canavari, M. (2012). Organic and conventional nonflavored yogurts from the Italian market: Study on sensory profiles and consumer acceptability. <i>Journal of the Science of Food and Agriculture</i>, 92(14), 2788-2795. • Bendini, A., Barbieri, S., Valli, E., Buchecker, K., Canavari, M., & Toschi, T. G. (2011). Quality evaluation of cold pressed sunflower oils by sensory and chemical analysis. <i>European Journal of Lipid Science and Technology</i>, 113(11), 1375-1384.
--	---

HORIZON-JU-CBE-2023-IAFlag-04: Valorisation of aquatic biomass waste and residues	
Research Group	<u>Maria Caboni, Maria Teresa Rodriguez Estrada, Federica Pasini</u> Department of Agricultural and Food Sciences
Short Bio of the Research Group	Maria Caboni (Full Professor), Maria T. Rodriguez Estrada (Associate Professor) and Federica Pasini (Assistant Professor) are Food Technologists involved in formulation and technological development of innovative food products, aimed at improving valorization of agri-food waste and by-products as well as circularity of food chains.
Expertise in relation to the topic	Expertise on extraction, analysis and valorization of lipids and bioactive compounds from agri-food waste for food and feed use, with particular attention to fast/mild processes and techniques. The Research Group has also a wide expertise on product formulation by using nanoemulsion and microencapsulation to improve bioactives' retention and stability, as well as on the characterization of food products by instrumental analysis and assessment of their oxidative stability (including the aroma profile) and safety regarding process contaminants (i.e. MCPD, acrylamide, oxysterols).
Relevant technologies	The Research Group has fully equipped labs with both preparative and analytical equipment, including spectrophotometers, GC-FID, GC-MS (conventional and Fast), SPME-GC-MS, HPLC-UV-DAD-FD and HPLC-QqQ. The group has also equipment for the assessment of the oxidative stability of oils and food (Oxitest), as well as for the physico-chemical characterization of emulsions (ZetaSizer Nano-ZS). In addition, the group has access to a processing pilot plant for dairy and meat products.
Previous EU funded projects & relevant publications	<u>Projects:</u> 1) Horizon EU Plan'eat: "Food systems transformation towards healthy and sustainable dietary behaviour" (2022-2026). Role: participant. 2) PRIMA--Section 2 GourMed: "Governance of food supply chain to equilibrate price and profits of high quality and safe Mediterranean foods" (2021-2024). Role: participant. 3) PRIMA-Section 2 BioProMedFood: "Bio-protective cultures and bioactive extracts as sustainable combined strategies to improve the shelf-life of perishable Mediterranean food" (2020-2023). Role: participant.

4) H2020 SUSFOOD2 ERA-NET Consortium: "Sustainable production of health-promoting n-3 LCPUFA using agro food industry by-products through microalgae" (grant agreement no. OVK 18/018, 2018-2020). Role: participant.

5) H2020 EcoPROLIVE: "Ecofriendly processing system for the full exploitation of the olive health potential in products of added value" (grant agreement no. 210177383, 2015-2017). Role: participant.

Publications:

1) Barbieri S., Mercatante D., Balzan S., Esposto S., Cardenia V., Servili M., Novelli E., Taticchi A., Rodriguez-Estrada M.T. (2021). *Improved oxidative stability and sensory quality of beef hamburgers enriched with a phenolic extract from olive vegetation water*. *Antioxidants*, 10, article number 1969, 1-22.

2) Tappi S., De Aguiar Saldanha Pinheiro A.C., Mercatante D., Picone G., Soglia F., Rodriguez-Estrada M.T., Petracchi M., Capozzi F., Rocculi P. (2020). *Quality changes during frozen storage of mechanical-separated flesh obtained from an underutilized crustacean*. *Foods*, 9, article number 1485, 1-16.

3) Di Nunzio M., Picone G., Pasini F., Chiarello E., Caboni M.F., Capozzi F., Gianotti A., Bordoni, A. (2020). *Olive oil by-product as functional ingredient in bakery products. Influence of processing and evaluation of biological effects*. *Food Res. Internat.*, 131, 108940, 1873-7145.

4) Martín-García B., Pasini F., Verardo V., Diaz-de-Cerio E., Tylewicz U., Gomez-Caravaca A.M., Caboni M.F. (2019). *Optimization of sonotrode ultrasonic-assisted extraction of proanthocyanidins from brewers' spent grains*. *Antioxidants*, 8(8), 282.

5) López-Cobo A., Gómez-Caravaca A.M., Pasini F., Caboni M.F., Segura-Carretero A., Fernández-Gutiérrez A. (2016). *HPLC-DAD-ESI-QTOF-MS and HPLC-FLD-MS as valuable tools for the determination of phenolic and other polar compounds in the edible part and by-products of avocado*. *LWT*, 73, 505-513.

HORIZON-JU-CBE-2023-R-01: Phyto-management; curing soil with industrial crops, utilising contaminated and saline land for industrial crop production

Research Group	<u>Annalisa Tassoni</u> Department of Biological, Geological, and Environmental Sciences
Short Bio of the Research Group	Annalisa Tassoni is Associate professor in General Botany. She currently holds the courses of Plant Biology and of Plants, Environment and Society of the degree in Natural Sciences and of the Course of Plant Biology and General Botany for the LT Sciences and Technologies for the Green and Landscape at the University of Bologna. She is part of the Doctorate in Life Sciences, Earth and Environment.

Expertise in relation to the topic	Expertise in the use of plants hyperaccumulators to phytoremediation of metals from contaminated soils, urban sludges, waters. Analysis of metals uptake in plant organs. In collaboration with WUR, use of synchrotrone technologies for localization of metals inside the plant organs. Expertise in plant physiology under salt stress or calt+metal stress conditions.
Previous EU funded projects & relevant publications	She is author of over 60 publications in journals and books. She was partner of the EU projects H2020 (2016-2021) NOAW and AGRIMAX and is Scientific Coordinator of the EU project PROLIFIC (H2020-BBI, 2018-2022) and WP leader of the project AGRILoop (Horizon Europe, 2022-2026).

HORIZON-JU-CBE-2023-R-01: Phyto-management; curing soil with industrial crops, utilising contaminated and saline land for industrial crop production

Research Group	<u>Andrea Contin</u> Department of Physics and Astronomy "Augusto Righi"
Short Bio of the Research Group	Andrea Contin is Full Professor of Applied Physics, Environmental, Political and Economic Management Systems, and Renewable Energy and Energy Management. The research group (EMRG group) The research group (EMRG group) deals with solutions for: <ul style="list-style-type: none"> • nutrients recovery from wastewater, using material deriving from advanced carbon, with a view to their possible reuse in agriculture • system analysis and models for the assessment of environmental benefits, with particular attention to negative emissions, carbon removal and the certification of carbon credits. • use of advanced carbons (funzionalized biochar) • recovery of critical raw materials • improvement of soil health • Life Cycle Thinking
Expertise in relation to the topic	Valorization of metal-reach biomasses from phyto-management practices for the production of energy and Second Generation Carbons (Advanced Carbons) with improved capability of adsorption for emergent pollutants.
Relevant technologies	<ul style="list-style-type: none"> – dedicated analytical lab – laboratory for medium-high TRL – Field instrumentation for on-site testing – LCA software
Previous EU funded projects & relevant publications	<u>EU funded projects:</u> <ul style="list-style-type: none"> • H2020 - (NET-Fuels) Carbon-Negative Sustainable Biofuels by Combination of Thermochemical and Bio-Electrochemical Processes • H2020 - (STAR-ProBio) Sustainability Transition Assessment and Research of Bio-based Products • EIT Food - (BTF) Black To the Future

Relevant Publications:

Nicolas Greggio; Mattia Benamati; Diego Marazza; Andrea Contin; Nicola Labartino; Sergio Piccinini, [Database of the residual biomasses in Emilia Romagna Region and relative production sites](#), in: Atti di Ecomondo 2017 "Green & Circular Economy" Risorse dai rifiuti: soluzioni innovative e conseguenze ambientali verso l'implementazione di un'economia circolare, in corso di stampa, pp. 1 - 1 (atti di: Ecomondo, Rimini, Mercoledì 8 Novembre 2017)

Carlotta Carlini; Antonio Primante; Nicolas Greggio; Enrico Balugani; Andrea Contin; Diego Marazza, [PO4 recovery using mixtures of biochar and carbonate materials](#), in: EGU General Assembly 2021, 2021, pp. 2716 – 2716

Hornung A.; Daschner R.; Ouadi M.; Zhou J.; Lieftink D.; Grassi A.; Capaccioli S.; Contin A.; Righi S.; Marazza D.; Baioli F.; Rapone I.; Langley M.; Tuck C.; Claret A.; Bastos J., [To-syn-fuel project to convert sewage sludge in value-added products](#), in: European Biomass Conference and Exhibition Proceedings, Firenze, ETA-Florence Renewable Energies, 2020, pp. 537 – 541

Hornung, A.; Ouadi, M.; Galileu Speranza, L.; Apfelbacher, A.; Hornung, T.; Hofmann, M.; Hygate, J.; Hilditch, P.; Lima, S.; Lieftink, D.; Capaccioli, S.; Grassi, A.; Contin, A.; Righi, S.; Marazza, D.; Quaranta, M.; Vogli, L.; Macrelli, S.; Blakey, S.G.; Lewis, C.; Valk, M.; Tuck, C.; Langley, M.; Ott, T., [Flexjet project, sustainable jet fuel from flexible waste biomass](#), in: 27th European Biomass Conference and Exhibition,, Firenze, ETA-Florence Renewable Energies, 2019, pp. 1 – 5

Marazza, Diego; Macrelli, Stefano; D'Angeli, Mirta; Righi, Serena; Hornung, Andreas; Contin, Andrea, [Greenhouse gas savings and energy balance of sewage sludge treated through an enhanced intermediate pyrolysis screw reactor combined with a reforming process](#), «WASTE MANAGEMENT», 2019, 91, pp. 42 - 53

HORIZON-JU-CBE-2023-R-01: Phyto-management; curing soil with industrial crops, utilising contaminated and saline land for industrial crop production

Research Group

Federica Zanetti

Department of Agricultural and Food Sciences

Short Bio of the Research Group

Senior Assistant Professor in Agronomy and Field Crops. Since the very beginning the principal research topic was focused on non-food oilseed crops, mainly belonging to the *Brassicaceae* and *Euphorbiaceae* families. Her research interests cover different aspects of agronomy and crop physiology, deepening the knowledge on the responses of these species to abiotic stresses, but also trying to introduce promising new oilseed crops in typical farming systems, as well as to tailor for these novel species *ad hoc* agronomic management practices aiming at increasing their productive performances in term of both seed quality and quantity.

Expertise in relation to the topic	Long term experience in non-food crops, for bioenergy and biobased applications, like oilseed crops, fiber crops, lignocellulosic crops. Experience on growing industrial crops on contaminated and marginal, idle and degraded land, such as saline soils.
Previous EU funded projects & relevant publications	Zanetti F., Editorial: Industrial Crops and Products unlocking the potential of bioeconomy: 32th AAIC International Conference , «INDUSTRIAL CROPS AND PRODUCTS», 2022, 188, pp. 115665 – 115665.

HORIZON-JU-CBE-2023-R-02: Optimised forest-based value chains for high value applications and improved forest management

Research Group	<u>Valentino Marini Govigli</u> Department of Agricultural and Food Sciences
Short Bio of the Research Group	Valentino Marini Govigli is Junior assistant professor (fixed term) at the Department of Agri-Food Sciences and Technologies, University of Bologna (Italy). He holds a PhD in Forest and Cultural ecology, a MRes in Ecology and Environmental Management, and a BAE in Economics. His fields of expertise are socioeconomics of agro-forest goods and services, consumer behaviour and stakeholder preferences, intangible ecosystem services assessment, social innovation brokerage and multi-actor engagement. Valentino has more than eight year of experience in applied agro-forestry research. Currently he works in the H2020 Project FOODLAND and LOWINFOOD, exploring best practices for food nutrition and sustainable farming in African food value chains through behavioural and experimental economics.
Expertise in relation to the topic	Forest economics; economic valuations; stakeholder engagement; forest policy analysis; Forest owners' behavioural studies; participatory methods and facilitations of forest-based conflicts around resources.
Previous EU funded projects & relevant publications	Jeanne-Lazya Roux, Agata A. Konczal, Andreas Bernasconi, Shonil A. Bhagwat, Rik De Vreese, Ilaria Doimo, Valentino Marini Govigli, Jan Kašpar, Ryo Kohsaka, Davide Pettenella, Tobias Plieninger, Zahed Shakeri, Shingo Shibata, Kalliopi Stara, Takuya Takahashi, Mario Torralba, Liisa Tyrväinen, Gerhard Weiss, Georg Winkel, Exploring evolving spiritual values of forests in Europe and Asia: a transition hypothesis toward re-spiritualizing forests , «ECOLOGY & SOCIETY», 2022, 27, Article number: 20 , pp. 1 - 20

HORIZON-JU-CBE-2023-R-03: Robust and optimised industrial biotech and chemical/industrial biotech processes

Research Group	<u>Lorenzo Bertin</u> Department of Civil, Chemical, Environmental, and Materials Engineering
Short Bio of the Research Group	Lorenzo Bertin received his Ph.D. in Industrial Chemistry in the 2003. From 2001 to 2014 he was Assistant Professor of Organic Chemistry at the Engineering Faculty of the University of Bologna. From September 2014 he is Associated Professor in “Chemistry and Biochemistry of the

	<p>Fermentations" and from March 2018 in "sanitary and environmental engineering". His main research activities focused and focus on the development of non-conventional aerobic and anaerobic biotechnological processes, mainly dedicated to the bioremediation of actual-site contaminated environmental matrices and to the bioconversion of biowaste into biogas, chemicals and biopolymers according to the biorefinery approach. He is the lead scientist of Research Units in EU and national projects. He published 63 full papers in international journals with IF and 8 book chapters. He got about 2000 citations, with a H-index of 31 (Scopus database, March 2022).</p>
<p>Expertise in relation to the topic</p>	<p>Development of biorefinery scheme fed by organic waste for the a) recovery of added-value molecules (e.g., polyphenols), b) production of small chain-fatty acids (among which, hexanoic acid) and polyhydroxyalkanoates (among which, polyhydroxyhexanoate, amorphous), production of biogas by anaerobic fermentation.</p>
<p>Previous EU funded projects & relevant publications</p>	<p>Lanfranchi A.; Tassinato G.; Valentino F.; Martinez G.A.; Jones E.; Gioia C.; Bertin L.; Cavinato C., Hydrodynamic cavitation pre-treatment of urban waste: Integration with acidogenic fermentation, PHAs synthesis and anaerobic digestion processes, «CHEMOSPHERE», 2022, 301, Article number: 134624 , pp. 1 - 9 [Scientific article]</p> <p>Samori' C.; Martinez G.A.; Bertin L.; Pagliano G.; Parodi A.; Torri C.; Galletti P., PHB into PHB: Recycling of polyhydroxybutyrate by a tandem "thermolytic distillation-microbial fermentation" process, «RESOURCES CONSERVATION AND RECYCLING», 2022, 178, Article number: 106082 , pp. 1 - 7 [Scientific article]</p> <p>Domingos J.M.B.; Martinez G.A.; Morselli E.; Bandini S.; Bertin L., Reverse osmosis and nanofiltration opportunities to concentrate multicomponent mixtures of volatile fatty acids, «SEPARATION AND PURIFICATION TECHNOLOGY», 2022, 290, Article number: 120840 , pp. 1 - 10 [Scientific article]</p> <p>Martinez G.A.; Puccio S.; Domingos J.M.B.; Morselli E.; Gioia C.; Marchese P.; Raspolli Galletti A.M.; Celli A.; Fava F.; Bertin L., Upgrading grape pomace contained ethanol into hexanoic acid, fuel additives and a sticky polyhydroxyalkanoate: an effective alternative to ethanol distillation, «GREEN CHEMISTRY», 2022, 24, pp. 2882 - 2892 [Scientific article]</p> <p>Sarah Notarfrancesco; Elena Morselli; Gonzalo A.Martinez; Weronica Harasimiuk; Joana M.B.Domingos; Andrea Negroni; Fabio Fava; Lorenzo Bertin, Improved recovery of carboxylic acids using sequential cationic-anionic adsorption steps: A highly competitive ion-equilibrium model, «SEPARATION AND PURIFICATION TECHNOLOGY», 2021, 261, Article number: 118253 , pp. 1 - 10 [Scientific article]</p>

HORIZON-JU-CBE-2023-R-04: Development of novel, high-performance bio-based polymers and co-polymers

Research Group	<u>Daniele Cespi, Fabrizio Passarini</u> Department of Industrial Chemistry "Toso Montanari"
Short Bio of the Research Group	The research group in environmental and cultural heritage chemistry is settled in Bologna and Rimini. The main research fields of our group include: physical-chemical characterization of waste streams and residues, their management and treatment for potential valorization; environmental sustainability assessment of product-systems and industrial processes through a life cycle approach; material flow analysis applied to the characterization of anthropogenic cycle of resources, their reserves in use and to analyze future scenarios of material supply; analysis of the criticality of resources; environmental monitoring activities; analysis of the effects of environment and pollutants on traditional and modern materials for artistic, architectural and industrial applications.
Expertise in relation to the topic	Expertise in: <ul style="list-style-type: none"> - Life Cycle Assessment (LCA) of different bio-based products and comparison with fossil-based chemicals - Use of sustainability indicators to assess chemical processes at both industrial and early design stage - Assessing the environmental sustainability of waste management strategies and EoL technologies - Environmental footprint of products/processes/systems, such as carbon footprint and water footprint
Relevant technologies	<ul style="list-style-type: none"> - LCA software - LCI databases - MFA software
Previous EU funded projects & relevant publications	<p><u>Projects:</u></p> <ul style="list-style-type: none"> - From 2018 to 2021, TSS2018B_3310-BPLAS_A B-PLAS "PLAS DEMO: Industrial demonstration of sludge to bioplastic pathway". - From 1/1/2020, Horizon 2020 Research and Innovation Staff Exchange (RISE) (Call: H2020-MSCA-RISE-2019, Topic: MSCA-RISE-2019 Type of action: MSCA-RISE). - From 1/09/2022, CL5-2021-D2-01 (Agreement ID: 1010696990) "STORMING – Structured unconventional reactors for CO₂-free Methane catalytic cracking". - From 1/09/2022, LIFE 21-ENV-IT-CROSS-LIFE project (n. 101074164) "CROSS – CROtonic acid from Sewage Sludge". <p><u>Relevant Publications:</u></p> <p>M. Volanti, D. Cespi, F. Passarini, E. Neri, F. Cavani, P. Mizsey, D. Fozzer, <i>Terephthalic acid from renewable sources: early-stage sustainability analysis of a bio-PET precursor</i>, «GREEN CHEMISTRY», 2019, 21, pp. 885 - 896</p> <p>Tripodi, Antonio; Bahadori, Elnaz; Cespi, Daniele; Passarini, Fabrizio; Cavani, Fabrizio; Tabanelli, Tommaso; Rossetti, Ilenia*, <i>Acetonitrile from Bioethanol Ammoxidation: Process Design from the Grass-Roots and Life</i></p>

Cycle Analysis, «ACS SUSTAINABLE CHEMISTRY & ENGINEERING», 2018, 6, pp. 5441 - 5451

Cespi, D.; Cucciniello, R.; Ricciardi, M.; Capacchione, C.; Vassura, I.; Passarini, F.; Proto, A., *A simplified early stage assessment of process intensification: Glycidol as a value-added product from epichlorohydrin industry wastes*, «GREEN CHEMISTRY», 2016, 18, pp. 4559 – 4570

Cespi, D.; Passarini, F.; Vassura, I.; Cavani, F., *Butadiene from biomass, a life cycle perspective to address sustainability in the chemical industry*, «GREEN CHEMISTRY», 2016, 18, pp. 1625 – 1638

Cespi, D.; Passarini, F.; Mastragostino, G.; Vassura, I.; Larocca, S.; Iaconi, A.; Chierigato, A.; Dubois, J.-L.; Cavani, F., *Glycerol as feedstock in the synthesis of chemicals: A life cycle analysis for acrolein production*, «GREEN CHEMISTRY», 2015, 17, pp. 343 - 355



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

LIFE SCIENCES & BIOECONOMY UNIT - LSB
RESEARCH SERVICES DIVISION - ARIC
ALMA MATER STUDIORUM - UNIVERSITY OF BOLOGNA (UNIBO)

lsb.bioeconomy@unibo.it