

# 9<sup>th</sup> International Conference on Biotechniques for Air Pollution Control and Biorefinery

## BIOTECHNIQUES – 2024



## **PROGRAMME**

**Palexco – Conference and Exhibition Center**

**A Coruña, Spain, July 10–12, 2024**

## July 10, 2024

17 h 30 – 19 h 30

**REGISTRATION**

## July 11, 2024

8 h 45 – 9 h 00

**WELCOME - OPENING**

**LECTURE**

9 h 00 – 9 h 30

Lessons learned from industrial biogas desulfurization: Paving the way for a clean energy future (O.J. Prado)

**ORAL PRESENTATIONS**

9 h 30 – 11 h 30

**Session 1 - CH<sub>4</sub> fermentation and biogas valorization**

9 h 30 – 9 h 45

Anoxic biodesulfurization of biogas: A techno-economic assessment (M. Ramírez)

9 h 45 – 10 h 00

Innovative biorefineries for bio-based industries: Bacterial diversity associated with ectoine production in a Taylor Flow reactor for biogas valorisation (A.F. Torres Franco)

10 h 00 – 10 h 15

Decreasing energy consumption in biogas desulphurisation: centrate nitrification with intensified constructed wetlands and simplification of the anoxic bioreactor operation (F. Sempere)

10 h 15 – 10 h 30

Biological mitigation of methane in presence of xylene and ethylbenzene in biofilters: effect of pollutants concentrations and empty bed residence time (L. Malhautier)

10 h 30 – 10 h 45

Sequential feast-famine process for polyhydroxyalkanoates production by mixed methanotrophic culture under different carbon supply strategies (A. Gęsicka)

10 h 45 – 11 h 00

Nitrification of landfill leachates by a pilot sequencing batch bioreactor for anoxic biogas desulfurization (D. Cantero)

11 h 00 – 11 h 30

**COFFEE BREAK (POSTERS)**

**ORAL PRESENTATIONS**

11 h 30 – 13 h 30

**Session 2 - CO<sub>2</sub> and syngas bioconversion (1)**

11 h 30 – 11 h 45	Production of the chiral molecule ( <i>R</i> )-3-hydroxybutyric acid in engineered <i>Cupriavidus necator</i> (F. Scott)
11 h 45 – 12 h 00	Novel strategies to improve CO <sub>2</sub> gas-liquid mass transfer during photosynthetic biogas upgrading (E. Hoyos)
12 h 00 – 12 h 15	Synergizing indoor carbon dioxide capture with microbial electromethanogenesis: The De-Cent Concept (S. Bolognesi)
12 h 15 – 12 h 30	Bioconversion of syngas-derived volatile fatty acids into high-value β-carotene and lipids (R. Robles)
12 h 30 – 12 h 45	<i>Rhodococcus opacus</i> DSM 43205 as a bacterial chassis for triacylglycerols accumulation from CO <sub>2</sub> and hydrogen derivatives (B. Araya)
12 h 45 – 13 h 00	<i>Guyparkeria halophila</i> as a novel cell platform for the efficient valorization of CO <sub>2</sub> and thiosulfate into ectoine (S. Cantera)
13 h 00 – 13 h 15	A new method to capture CO <sub>2</sub> using microalgae (E. Elghazy)
13 h 15 – 14 h 30	<b>LUNCH + POSTER SESSION</b>
14 h 30 – 16 h 30	<b>ORAL PRESENTATIONS</b> <b>Session 3 - Waste gas and biogas biotreatment</b>
14 h 30 – 14 h 45	Bioaugmentations enhancing the biological removal of gaseous chlorinated volatile organic compounds (Lichao Lu)
14 h 45 – 15 h 00	Performance evaluation of a wood chips biofilter at a rendering plant using a combination of olfactometry, sensory analyses and drone sensor technology (T. Van Elst)
15 h 00 – 15 h 15	Landfill biogas biodesulfurization by a pilot-scale anoxic bioscrubber (S. Torres)
15 h 15 – 15 h 30	Advancing biofilter monitoring: Adaptive control with complex signal pattern analysis (S. Prechel)
15 h 30 – 15 h 45	Assessment of microbial consortia for the degradation of recalcitrant volatile compounds (alkanes) (L. Malhautier)
15 h 45 – 16 h 00	Bioactive functional materials, mass transfer enhancement technology and coupling process for effective biological purification of VOCs gases (D. Chen)
16 h 00 – 16 h 15	A convenient method to validate the gas flow of a CFD-CT simulation applied on a packed bed used in gas biofiltration through residence time distributions (F. Carreño)
16 h 15 – 16 h 30	Performance of a moving-bed biofilm reactor (MBBR) for treating toluene vapor (Morteza Zamir)
16 h 30 – 17 h 00	<b>COFFEE – BREAK (POSTERS)</b>

17 h 00 – 18 h 45	<b>ORAL PRESENTATIONS</b> <b>Session 4 - Gas fermentation and other biorefinery processes</b>
17 h 00 – 17 h 15	BTEX <sub>S</sub> valorization into high-value products: A circular approach to air treatment (N. Díaz)
17 h 15 – 17 h 30	A new methodology to determine $k_{La}$ in airlift reactors based on a non-intrusive image analysis technique (J. Saleh)
17 h 30 – 17 h 45	Continuous biobutanol production from rice straw in high-cell systems: immobilized stirred tank reactor vs. packed bed (C. Silvestre)
17 h 45 – 18 h 00	Anaerobic membrane bioreactor for real antibiotic pharmaceutical wastewater treatment: Positive effect of fouling layer on antibiotics and antibiotic resistance genes removals (L.X. Zhou)
18 h 00 – 18 h 15	Development of a novel pressurized headspace-free Hydrogen Uptake Rate methodology (M. Fachal)
18 h 15 – 18 h 30	Enhancement of CO <sub>2</sub> capture and microalgal biomass production in an AirLift photoreactor under static magnetic field exposure (L. A. Torres)
18 h 30 – 18 h 45	Application of a surface methodology to assess CH <sub>4</sub> fugitive emissions and biogas recovery efficiency in Catalan landfills (D. González)
20 h 30 – 23 h 00	<b>CONFERENCE DINNER</b> <b>(Ticketed event only)</b>
<b>July 12, 2024</b>	
	<b>LECTURE</b>
9 h 00 – 9 h 30	Selecting the best acetogen for fast and efficient microbial electrosynthesis of acetate from CO <sub>2</sub> (J. Philips)
9 h 30 – 11 h 15	<b>ORAL PRESENTATIONS</b> <b>Session 5 - CO<sub>2</sub> and syngas bioconversion (2)</b>
9 h 30 – 9 h 45	The influence of temperature on the production of ethanol and butanol via syngas fermentation by <i>Clostridium carboxidivorans</i> (T. Ferreira)
9 h 45 – 10 h 00	<i>Rhodotorula toruloides</i> exhibiting lipid accumulation through the utilization of volatile fatty acids derived from syngas fermentation (C. Naveira)

10 h 00 – 10 h 15	Innovative anaerobic utilization of gasified waste plastics through microbial metabolic engineering (C. Da Silva)
10 h 15 – 10 h 30	Microbial cell platforms for CO <sub>2</sub> valorization into pharm and cosmetic ingredients (S. Cantera)
10 h 30 – 10 h 45	From waste gases to valuable chemicals: Optimizing acetone production with <i>Acetobacterium wieringae</i> via gas fermentation (J. Moreira)
10 h 45 – 11 h 00	Biological production of pharm ingredients using syngas (E. Marcos)
11 h 00 – 11 h 15	Effect of syngas inflow on the kinetics of acid production by <i>B. methylotrophicum</i> (M. Pacheco)
11 h 15 – 11 h 45	<b>COFFEE – BREAK (POSTERS)</b>
11 h 45 – 13 h 30	<b>ORAL PRESENTATIONS</b> <b>Session 6 - NO<sub>x</sub>/SO<sub>x</sub> biotreatment and valorization</b>
11 h 45 – 12 h 00	The effect of NO concentration the biological conversion from NO to N <sub>2</sub> O in the thermophilic condition (Dan Li)
12 h 00 – 12 h 15	Pulp mill waste streams provide electron donors for denitrification of saline wet NO <sub>x</sub> -SO <sub>2</sub> scrubber wastewater (A. D'Aquino)
12 h 15 – 12 h 30	Pathway analysis of oxygenic denitrification and domestication enrichment of functional microorganisms (J. Chen)
12 h 30 – 12 h 45	Enhanced removal of trace sulphurous odorants by combining with packing modification and surfactant (X. Kong)
12 h 45 – 13 h 00	Study of bioaugmentation using SRBAO-artificial granules to prevent acetate accumulation in sulfidogenic bioreactors (R. Castro)
13 h 00 – 13 h 15	Nitric oxide abatement in a two-phase partitioning bioreactor (TPPB) (D. Cubides)
13 h 15 – 13 h 30	Mathematical modelling of a sulfidogenic UASB bioreactor fed with crude glycerol: model calibration, validation and scenario analysis (E. Valdés)
13 h 30 – 14 h 45	<b>LUNCH + POSTER SESSION</b>
14 h 45 – 16 h 30	<b>ORAL PRESENTATIONS</b> <b>Session 7 - Syngas fermentation and chain elongation</b>
14 h 45 – 15 h 00	Production of hexanoate by a synthetic co-culture of a recombinant <i>Acetobacterium woodii</i> and <i>Clostridium drakei</i> (K. Baur)

15 h 00 – 15 h 15	Impact of operation mode on ethanol chain elongation: a comparative study of MCCA production by <i>Clostridium kluyveri</i> (C. Fernández)
15 h 15 – 15 h 30	Non-methanogenic syngas conversion by ALE derived acetogenic consortia to produce <i>n</i> -caproate (L. Rachbauer)
15 h 30 – 15 h 45	Bioconversion of CO <sub>2</sub> to caproic acid with Zero Valent Iron: Optimizing carbon flux distribution in co-cultures of <i>Acetobacterium woodii</i> and <i>Megasphaera hexanoica</i> (Z. Wang)
15 h 45 – 16 h 00	Evaluating the economic viability of biorefinery: Integrating biological caproate production and anaerobic digestion for acid whey bioprocessing (F. Brodowski)
16 h 00 – 16 h 15	Gas fermentation. A promising technology for today's challenges (D. Orol)
16 h 15 – 16 h 45	<b>COFFEE – BREAK (POSTERS)</b>
	<b>ORAL PRESENTATIONS</b>
16 h 45 – 18 h 30	<b>Session 8 - Bioprocess optimization for waste gas treatment</b>
16 h 45 – 17 h 00	Minimizing odor impact from urban waste by digital transformation in the city of Córdoba (M. Salinas)
17 h 00 – 17 h 15	Iron-dependent effects of cycloalkane degradation and its mechanism of regulating biofilms (Z. Sun)
17 h 15 – 17 h 30	Low contact time biofiltration for odor removal in wastewater treatment plant: Re-defining limits, opportunities, and challenges (M. Hernández)
17 h 30 – 17 h 45	Stimulation of toluene biofiltration by a static magnetic field (E. López)
17 h 45 – 18 h 00	Bacterial aerosols released from household municipal solid waste in residential areas: implications to health risks (Wenjing Lu)
18 h 00 – 18 h 15	Overcoming bioavailability limitations of hydrophobic pollutants using a multi-channel capillary reactor (B. Kraakman)
18 h 15 – 18 h 30	<b>CLOSING SESSION</b> <b>END OF CONFERENCE</b>