ISMET news

SPRING 2021 :: issue 20

BIANNUAL NEWSLETTER

A MESSAGE FROM :: the editor

Dear ISMET community,

Welcome to the 20th edition of ISMET news. Here in the UK Spring is most definitely in the air, which means a transition from cold, grey and dark to bright, warm (ish) and colourful. The artwork this newsletter is my favourite sight at this time of year – crocuses coming out on my lawn and pointing their faces to the sun. To add to this the world seems to be taking its first baby steps out of lockdowns, travel bans and the solitude and isolation the pandemic has brought upon us.

It is with this optimistic and positive standpoint that we bring you an ISMET news full of highlights. Firstly, we highlight the new additions to the ISMET organizational structure: Our new ISMET Ambassadors Ola Gomaa and Rabeay Hassan representing Africa, and Angela Cabezas and Ignacio T. Vargas representing Latin America. Appointment of the ISMET Ambassadors is part of a longer journey of our society to restructure and become literally global.

Our next sections highlight the achievements of our community members in securing project funding and delivering fantastic research: Dr An-Ping Zeng describes the launch of the German Research Foundation (DFG) on Electro-Biotechnology; Belén Barroeta showcases the ambitious ELECTRA European-Chinese research project funded by the European Commission; and Dr. Lu Lu shares his research from the Harbin Institute of Technology. Updates are given on a highlight for us all to look forward to - the next EU and AP ISMET conferences. And finally, we highlight some of our new PhD graduates, many of whom had to complete their studies in very challenging conditions showing resilience and commitment that will serve them well in their future careers.

Liz Heidrich

ISMET news Editor

ISMET
international society for microbial electrochemistry and technology

Dr. Elizabeth Heidrich

Crocus in Spring, Watercolor on Paper

In this issue

AP ISMET-5, Harbin, China

The 5th AP-ISMET hosted by the Harbin Institute of Technology School of Environment was scheduled for March 6-9, 2020, at Harbin Victories Hotel, China. Preparations were completed and 300 participants were expected, then COVID struck. After the third postponement of the conference, we are now pleased to announce:

1. The 5th AP-ISMET conference will be held on July 16-18, 2021.

2. The conference will be conducted in a combination of on-site conference and online conference. Domestic participants will partake in the on-site conference (registration fee remains unchanged), and attendees outside China can join the online meeting (the registration fee is 50 USD for regular ones / 25 USD for students.

3. For those who have completed registration and payment, all the conference activities will be valid at the time of the conference and will continue to be implemented.

4. For delegates who have already paid their fees and are unable to attend the conference in July 2021, please email to hit2020@apismet2020.com. The organizing committee will refund the registration fees after the conference.

5. The abstract submission deadline will be extended to April 3, 2021, and conference registration deadline will be extended to May 30, 2021. For delegates who want to update the abstract, please send the new abstract to hit2020@apismet2020.com.

We sincerely apologize for the inconvenience caused by the postponement of the 5th AP-ISMET conference. We express our heartfelt thanks for your understanding and look forward to your participation in the conference in July.

Organizing Committee of the 5th AP-ISMET Conference

EU ISMET-5, Girona, Spain

Dear colleagues,

We are pleased to invite you to participate in the 5th European Meeting of the International Society for Microbial Electrochemistry and Technology (EU-ISMET) to be held between 13-15 September 2021 in Girona, Spain. We have the ambition to connect scientists, industries, governmental organizations, and other stakeholders that are interested in the world of Microbial Electrochemistry and Technologies. The 3-day conference will begin with the traditional ISMET workshop in which lectures ranging from molecular scale to scaled-up processes will be given.

The abstract submission deadline is May 15th. See: https://euismet2021.eu/

The format of the meeting (online, presential or hybrid) is not defined yet. We monitor the ever-changing COVID-19 situation and make decisions based on the latest guidelines given by countries and health agencies.

Further information will be given through the ISMET community database, 5th EU-ISMET website (https://euismet2021.eu/) and twitter account (@Euismet2020G).

Looking forward to seeing you all in Girona in good health and safe conditions,

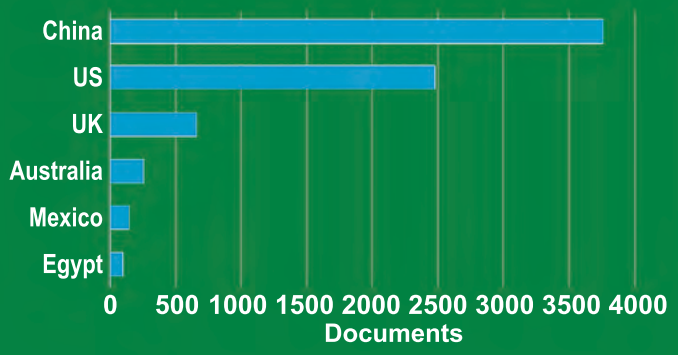
Dr Sebastià Puig, Chairman of EU-ISMET2021

ISMET expands globally::
Latin America and Africa

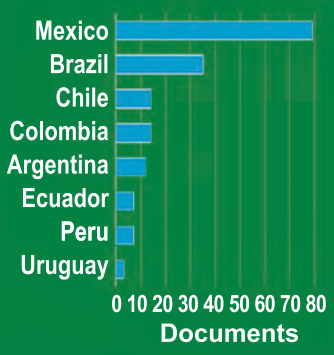
Recently, two new regions, Africa and Latin America, joined our society. Early\ February the first meeting of ISMET Ambassadors and Vice Ambassadors was held chaired by President-elect Falk Harnisch. "This marks the start of a longer journey for global integration. This will strengthen our society", said Harnisch.

The ambassador of ISMET in Latin America (LA), Angela Cabezas, is an associate professor at the Technological University (UTEC) in Durazno, Uruguay. The vice ambassador Ignacio T. Vargas is an associate professor at the Pontificia Universidad Católica in Santiago, Chile. Angela started to perform research in microbial electrochemical technologies (MET) in 2008 and Ignacio in 2010. Both are actually involved in MET research in their countries, ISMET members and have attended ISMET meetings in the past.

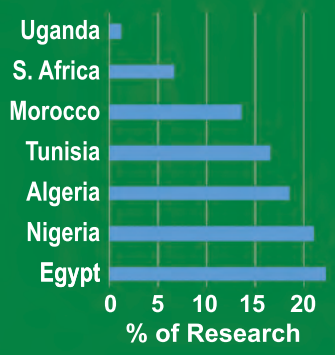
The ambassador of ISMET in Africa, Ola Gomaa, is a professor of Microbial Biotechnology at the Egyptian Atomic Energy Authority in Cairo, Egypt. The Vice Ambassador is Rabeay Hassan, Associate Professor at Zewail City of Science and Technology (Cairo, Egypt). Ola started MET research in 2010. Rabeay joined the group of Biosensors and Bioelectronics in 2013, University of Technology Potsdam, Germany, as a Postdoctoral research fellow. Both are active MET researchers who developed international collaborations in the field within and outside Africa. They hope to include more African researchers in ISMET society.



Number of 'MFC' documents published – country with the highest number in each continent



MFC research articles by subject



MFC related research in Africa

Latin America

Latin America is a vast region highly diverse in terms of culture, size, population, geography, political stability and economic situation. This diversity implies inequalities in the research opportunities and competitiveness. Different industries and ecosystems, some with very high biodiversity or extreme environments, offer so many singular topics to research, ideas to follow and possible applications for MET, many still unexplored.

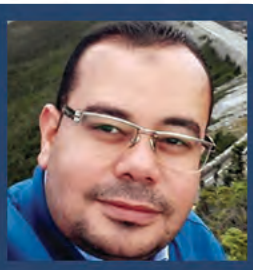
MET research in Latin America started in 2008-2010, and has been increasing with some research groups now established. However a Scopus search for the term 'Microbial fuel cell' shows that only 164 out of a total of 6,416 research articles include Latin American countries in their affiliations, just 2.6 . Only eight countries from the 20 that belong to Latin America are present in the search, despite the highly diverse research being done.

Angela Cabezas

Ignacio Vargas

This helps to form the two main reasons we became ISMET ambassadors. Firstly, we need to further boost the development of research in MET in Latin America by identifying barriers and opportunities. Secondly, we need to establish a strong and united scientific community in the region. In general, the Latin American groups interact with groups from other regions of the world but seldom between each other. A Latin America network will allow us to discuss our problems and find local solutions. We hope to encourage more scientists to start research in this area. We also hope this will bring Latin American researchers closer to ISMET finally increasing the LA members of the society. We will create a database of Latin-American researchers in the field, and plan. workshops and courses for students and researchers. Being ISMET ambassadors gives us support and aid in organizing us to bring us together, gain strength and visibility.

Ola Gomaa



Rabeay Hassan

MET in Africa

Africa is a big continent with 48 countries in the mainland plus 6 islands. The North African countries such as Egypt, Tunisia, Morocco and Algeria are also known as the South Mediterranean countries, while the Central, Eastern, Western, Southern countries are known as Sub-Saharan countries. Africa includes different ethnic and cultural diversity. It is a fast-growing population that requires huge funds to support the development and research requirements needed to solve its problems.

The United Nations, EU Commission, UK funds and National funding agencies all support pathways to empower local research and encourage travel to western countries with the aim of elevating research in Africa and therefore solving problems such as energy, water, food and health. This has resulted in a surge in MET research in the past few years, yet there remain many challenges including cost, up-scale and sustainability.

Like Latin America, the barriers to research are illustrated in publications. Although the number of publications from Africa has increased since around 2015, the number is very low as compared to other countries. MET research is being conducted in Egypt, Algeria, Nigeria, Morocco, South Africa, Tunisia and Uganda, though most is through collaborations with western countries. The highest number of researchers working in MET belongs to Egypt where travel abroad in highly encouraged via different mobility schemes.

The Africa ambassador and vice ambassador hope to expand the community and visibility in the region. They plan to organize workshops, seminars and summer schools for undergraduate and postgraduate students. A database will be created for African researchers already working in this field. The next step is to establish a MET official African scientific community and assign a point of contact in each country by involving young researchers. The growing number of MET research and African researchers along with the promising scientific outcome give hope that we will reach our goals very soon.

electromicrobiology :: BIOREMEDIATION
First EU-China funded joint initiative

KoM Consortium

The ELECTRA project is one of the most ambitious initiatives undertaken so far to exploit the huge potential of electromicrobiology for water, soil and sediment bioremediation. ELECTRA is coordinated by the School of Life Sciences at FHNW (Prof Philippe Corvini) and University of Ghent (Prof Korneel Rabaey). The project was launched on January 2019.

ELECTRA is the first collaborative project on bioremediation between the European Union and China and is part of the EU-China flagship initiatives on biotechnologies for health and environment. The objective is to develop and validate bioremediation strategies based on the use of microbial electrochemical technologies (METs) tested under relevant environmental conditions.

With a total of 6.8 million euros, the consortium consists of 22 universities, research centres and companies in the EU and China. Over the 4-year duration of the project, ELECTRA aims at improving bioremediation of groundwater, wastewater as well as sediments and soil, using innovative approaches based on microbial electrochemical technologies, committed to have a low energy or low use of chemicals for decontamination of the impacted sites.

The partners include some of the main European groups in the MET field such as the Ghent University (Belgium), the Helmholtz Zentrum für Umweltforschung (Germany), University of Bologna, the University of Girona and large and small companies such as the Chinese SME Tianjin Wisdom Spring Technology, the German remediation company IEG Technologie or the Spanish technology start-up METfilter.

Five research institutions acting as international partners constitute the consortium funded by National Natural Science Foundation of China (NSFC). The Chinese company Tianjin Wisdom Spring Technology has a key role in replicating field test experiments from European sites to Chinese spots.

The aim of the project is lower the level of pollutants in soil, groundwater and wastewater that can be degraded in an environmentally friendly manner. This is done using bioremediation techniques with the least possible use of chemicals and energy. The investigations focus on processes of electromicrobiology. The microbial degradation and biotransformation of pollutants are stimulated by electrons. The substances under investigation range from poorly degradable hydrocarbons to toxic metals to trace organic compounds such as antibiotics.

"We share a common interest in environmentally friendly remediation of contaminated sites and sediments. Our research project builds several bridges between researchers from China and Europe. The goal is to work together to address these challenges, thereby improving the quality of life for future generations, "says Philippe Corvini, Head of Institute for Ecopreneurship at the School of Life Sciences-FHNW.

-Belén Barroeta, IMDEA Water, Spain

Further information: www.electra.site

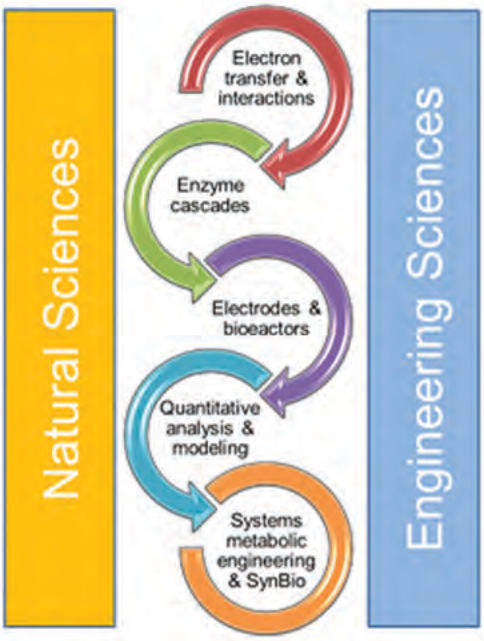
ELECTRA has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement N. 826244. The information reflects only the author's view and the Commission is not responsible for any use that may be made of the information contained.

KoM Consortium, Muttenz FHNW

A national priority research programme of the German Research Foundation (DFG) on electrobiotechnology took off in 2021

In Germany, a prestigious national collaborative Priority Programme (SPP) in the area of Electro-biotechnology was set up in 2020 and gets officially stated 2021. The DFG SPP 2240 entitled **Bioelectrochemical and engineering fundamentals to establish electrobiotechnology for biosynthesis – Power to value-added products** (eBiotech) includes 14 selected research projects with more than 25 research groups from universities and research centres. The first period of the programme is approved for three years with a budget over 6 Mio. Euro. SPPs typically run for six years.

SPP 2240 eBiotech focuses on fundamentals of electro-biotechnology. Specifically, scientific questions from basic electron transfer mechanisms in bioelectrochemical systems (BES) to fundamental reactor and microorganisms design will be studied quantitatively and systematically. For these purposes new and more reliable methods and tools are to be developed for quantitative analysis, modeling and system-level understanding of BES. Design principles will be worked out to develop suitable electrodes and bioreactors and to establish new extracellular electron transfer pathways and electroactive biocatalysts (enzymes and microorganisms) for efficient biosynthesis.



The SPP 2240 e-Biotech covers the following topics:

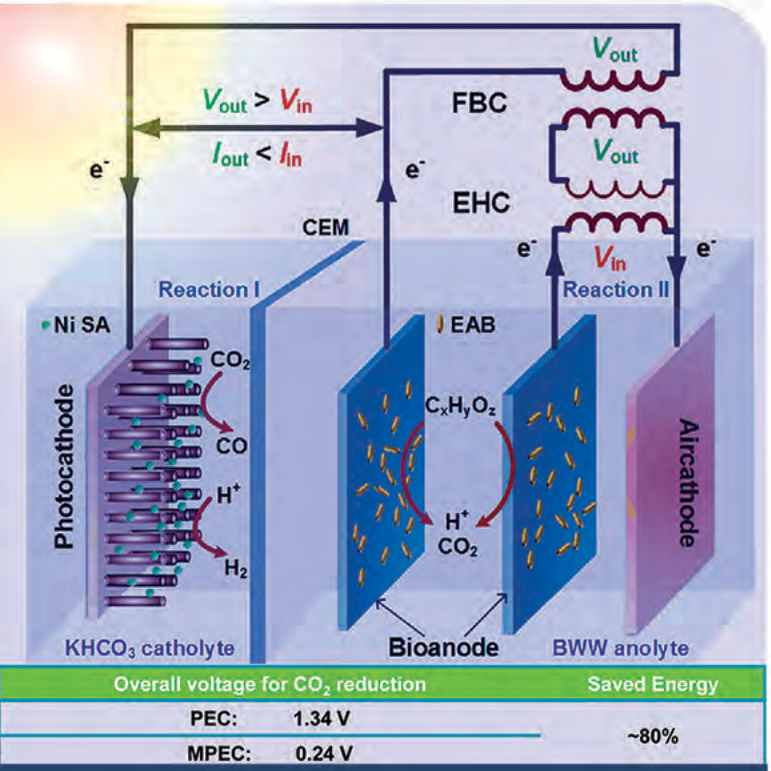
1. Electroactive microorganisms and fundamentals of electron transfer and interactions
2. Enzyme cascades and electro-enzymatic biosynthesis processes
3. Electrode and reactor engineering for efficient bio-electrochemical processes
4. New methods and tools for quantitative analysis and modeling of BES
5. Systems biology and metabolic engineering of microorganisms for electro-biosynthesis

The Priority Program emphasizes collaborations between groups of natural science and engineering across locations. Each project typically involves two or three research groups from different disciplines to jointly explore the topics and central scientific questions mentioned above.

Within the SPP eBiotech more than new 25 PhD students and Postdocs will be supported. Budgets are also allocated for rotating PhD students in different labs and for inviting international guests and experts for short term stay or workshops and seminars to be organized by the SPP coordination team.

For scientific enquiries about the SPP eBiotech please contact the Programme coordinator: Prof. Dr. An-Ping Zeng, Institute of Bioprocess and Biosystems Engineering, TU Hamburg, AZE@TUHH.de.

Microbial electrochemistry meets artificial photosynthesis: spontaneous photoelectrosynthesis using wastewater

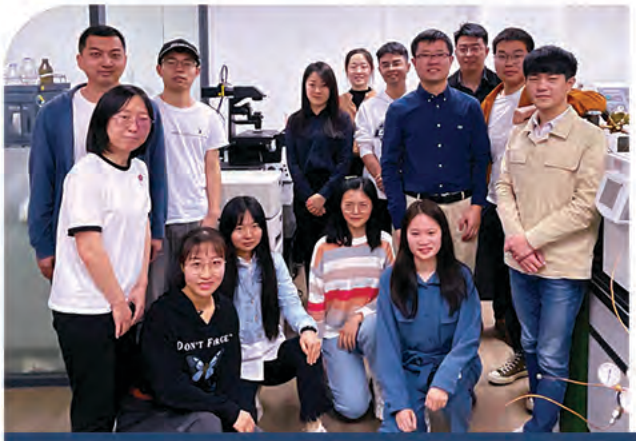


Schematic diagram of MPEC system for syngas prodution

After finishing work at Princeton University in 2020, Dr. Lu Lu joined Harbin Institute of Technology, Shen Zhen, in China and was appointed as a full professor in the school of Civil and Environmental Engineering. He has worked as a Senior Researcher and Postdoctoral Research Associate at the Princeton University and University of Colorado Boulder, respectively from 2012 to 2020. His research interests mainly focus on addressing environmental and energy issues via integrating microbial electrochemical technologies (METs) with other disciplines.

One fascinating fruit of multidisciplinary research recently generated by Lu's group has been a hybrid of MET and artificial photosynthesis system (APS) named microbial photoelectrochemical (MPEC) system. APS has recently emerged as an exciting technology for CO2 valorization and storage of intermittent solar energy into transportable and storable fuels. However, the anodic half-reaction of water oxidation in APSs is an energy intensive process, leading to a strict requirement of semiconductor energetics for efficient light-absorption. Few semiconductors exist with the suitable band edge positions that can do an unassisted APS reaction, therefore most APSs need an extra bias provided either by photovoltaics or by employing a complex multijunction tandem photoelectrode. The MPEC cell provides the possibility of constructing a self-sustaining system, where anodic electroactive bacteria oxidize the organics in wastewater, rather than abiotic electrode oxidize water, to support spontaneous reduction reactions occurring on photocathode surface due to recovery of chemical energy from organics. We experimentally verified the feasibility of unbiased hydrogen evolution reaction (HER) with high rate in MPEC system (Energy & Environ. Sci. 2019, 12: 1088-1099; Environ. Sci. & Technol. 2017, 51: 13494-13501). Then, the MPEC system was utilized to power a more energy-intensive process, CO2 reduction reaction (CO2RR). Over the last few decades, materials science communities have developed a lot of methods and catalysts to reduce CO2, however, CO2RR still remains challenging primarily due to its poor thermodynamic efficiency (high overpotential). Here, a pulse-frequency modulation boost-converter and charger was therefore elaborately designed to enlarge the energy output of the microbial anode. In this manner, CO2RR and HER occur simultaneously and spontaneously, leading to syngas production with a flexibly tunable ratio between CO and H2 (Joule. 2020, 4, 1-13).

In this way, MPEC studies not only open up a new way to solve water-energy-carbon problems synergistically, but also bridge the communication between MET and APS or photoelectrochemical communities and to facilitate interdisciplinary collaborations between the two fields.



Dr, Lu Lu's research team

Dr. Dan Aiken

Title: The Rational Design of a Bio-electrochemical System
Supervisors: Tom Curtis, Elizabeth Heidrich
Affiliation: Newcastle University, UK
Description: Reducing energy use is a key challenge for the wastewater industry. Microbial electrolysis cells (MEC) may provide a solution. Yet despite over 40,000 publications no commercially viable bio-electrochemical has been developed. My thesis is a guide to a commercially viable MEC design. The research has four stages: 1) Determination of cost-performance targets, 2) Observation of performance in controlled conditions analogous to the 'real-world', 3) Development and calibration of a model MEC using empirical data, and 4) Prediction of MEC cost-performance over a range of acetate concentrations and anode interstices' widths. MECs can compete financially with AS if: material costs are <£5/m2 standardised to the anode's surface; wastewater is pre-treated to obtain a steady supply of acetate >100mg-COD/l; anode interstices widths are carefully controlled; and biofilms remain stable.

Dr. Gourav Bhowmick

Title: Development of Bio-Electrochemical System Assisted Advanced Hybrid Treatment Systems for Aquacultural Wastewater
Supervisors: Prof Makarand Madhao Ghangrekar and Prof Rintu Banerjee
Affiliations: Indian Institute of Technology Kharagpur. India
Description: During my Doctoral period, I have worked on the preparation and application of carbide-derived carbon and carbon nanotubes-based oxygen reduction reaction catalysts, polymer derived ceramics based dual-purpose membranes with proton exchange as well as filtration properties for application in integrated microbial fuel cell (MFC) - membrane bioreactor (MBR) assemblies. I have also explored green synthesis of metal-based electrocatalysts and Bi-doped TiO2 as a low-cost photo-catalyst for application in pilot-scale MFCs. Not only limiting myself to the laboratory work, I have also designed and developed a hybrid sewage treatment system with 125 L/h of capacity for real-life applications with the final effluent quality equivalent to the domestic non-kitchen water supplies with less carbon and plant footprint.

Dr Robin Bonné

Title: Electrical wires in nature: A study of the conductive structure and intrisc electrical properties of cable bacteria
Supervisors: Prof dr. Jean V. Manca, Prof dr Bart Cleuren, Prof dr Jaco Vangronsveld
Affiliation: X-LAB, Hasselt University, Belgium
Description: A world without electronics is literally unthinkable, but the global amount of electronic waste that is not recycled grows yearly by 40 million tons, biodegradable alternatives are desperately needed. Cable bacteria are thought to conduct electricity from cell to cell, but the conduction was never really measured directly.
The team at X-LAB in UHasselt, in collaboration with UAntwerpen and TUDelft, directly measured current through dry cable bacteria that were taken from their natural environment. Conductivities exceeding 10 S/cm over a centimetre distance. Using AFM, this was found to occur over a set of parallel fibres in the periplasmic space that run along the filament and are interconnected at the junctions between two cells, making the conduction fail-safe in case of damage. Nature made long-range electrical circuits with amazing properties long before humans were there to discover electricity: these creatures can inspire us to make our electronics greener and fully biodegradable.

Title: Bioelectric toilet: For onsite treatment of blackwater to facilitate reuse of treated water and electricity generation for onsite applications
Supervisor: Prof Makarand M. Ghangrekar
Affiliation: Indian Institute of Technology, Kharagpur
Description: Decentralized bio-electrochemical technology sanitation management facility can efficiently manage the wastewater generated from toilets. In this research, low-cost transition metal oxide alloy based, and organometallic compound based cathode catalysts were investigated. Sn5Cu84 (Cu-Sn) alloy based microparticles were observed most economical and efficient alternative for field-scale microbial fuel cell operation. Alkali-treated blended clayware membranes exhibited excellent performance for field-scale MFCs. Stacked MFC based treatment systems (1500 L at IIT Kharagpur and 720 L at NTPC NETRA, Greater Noida) were designed so treated water could be reused for toilet flushing, reducing 80% to 90% freshwater consumption. A mathematical model for clayware-MFCs was also developed and performance was successfully validated.

Dr. Indrasis Das

Title: Indirect Characterization of Electrochemical Behaviour of Microbes in a Microbial Fuel Cell
Supervisors: Prof Prakash C Ghosh, Co-supervisor: Prof Suparna Mukherji
Affiliation: Department of Energy Science and Engineering, Indian Institute of Technology Bombay, Mumbai, India
Description: I study the cathodic platinum loading in a single chamber MFC which is reduced to match the ORR kinetics with the microbial kinetics on the anode. The electrochemical characteristics of the specific microbes used at the anode – Escherichia coli MTCC 1610 and Pseudomonas aeruginosa RS1– are similar to the matching cathodic platinum loading. A novel electrode assembly using 4 different platinum loadings on the cathode with a common anode was developed. E. coli is found to be equivalent to 0.032 mg/cm2 of Pt while P. aeruginosa is found to be equivalent to 0.011 mg/cm2 of Pt on the basis of their charge transfer resistances, indicating that this strain of E. coli is better for use in BES. This can be used as a basis for comparison of the electrogenic activity of the microbes, and help researchers understand the activity of different biocatalysts in BESs.

Dr. Reeshab Goenka

Title: Steering CO2 bio-electrocycling into valuable compounds through inline monitoring of key operational parameters.
Supervisors: Dr Jesús Colprim, Dr Marilós Balaguer, Dr Sebastià Puig.
Affiliation: LEQUiA, Institute of the Environment, University of Girona, Spain
Description: This Doctoral Thesis investigates reliable operational procedures for the monitoring of METs performance during the production of suitable substrates from CO2 for economically viable downstream applications. Besides exploring new strategies for the inoculation and feeding of bioelectrochemical systems, the thesis demonstrates that in-line monitoring of pH and electron consumption are meaningful operational variables to differentiate between carbox ylate and alcohol production. This opens the door to develop new approaches to control the bio-electrorecycling of CO2 into biofuels.

Dr Ramiro Blasco Gómez

Dr Paniz Izadi

Title: Comprehensive study of biocathode in bio-electrochemical system (BES) for energy harvesting and CO2 conversion
Supervisors: Prof Eileen Yu, Prof Ian Head
Affiliation: Newcastle University, UK
Description: My PhD thesis was a comprehensive study on biocathodes in bio-electrochemical systems, particularly anaerobic biocathode converting CO2 to valuable organic products. I investigated the potential methods to develop a highly conductive and efficient CO2 reducing biofilm during microbial electrosynthesis, and studied the fundamental properties of the biofilm and the mechanisms involved between the biofilm and cathode. My research was further directed towards steering the production from CO2 to longer chain carboxylic acids and alcohols than C2 compounds through steps of design optimisations. Development of oxygen reducing biocatalyst as an efficient alternative to Pt-based catalysts in microbial fuel cells was also investigated.

Dr. Amulya Kotamraju

Title: Sustainable Production of Succinic Acid and Polyhydroxyalkanoates through Waste Valorization and CO2 Sequestration in a Biorefinery Framework
Supervisor: Dr S. Venkata Mohan
Affiliation: CSIR-Indian Institute of Chemical Technology, Hyderabad, India
Description: The thesis aimed to sustainably produce two different products, a bio-based platform chemical succinic acid and a biodegradable polymer, polyhydroxyalkanoates exhibiting a potential scope for implementation in the circular biobased economy. The major focus was to gain in depth understanding of both the production processes and possible integrations for the development of a waste biorefinery. Succinic acid production was carried out in three different approaches, which include anaerobic fermentation, bioelectrochemical synthesis and gas fermentation. PHA production was carried out by first optimizing the process parameters followed scaling up of the process. Finally, both the processes were coupled with acidogenic fermentation as a central node to develop an integrated waste biorefinery

Dr Joshua Jack

Title: Rethinking the carbon economy: Combined electrochemical and biological reduction for carbon dioxide capture and valorisation
Supervisors: Dr Jason Ren
Affiliation: University of Colorado, Boulder, USA
Description: Joshua's research focused on improving the overall production rates of microbial electrosynthesis using a new decoupled approach that separates electron transfer and utilization. Building off foundational skills in electrocatalyst design and microbial culturing, he developed a new two-stage hybrid system that first electrochemically reduces carbon dioxide into an intermediate compound that is further valorised into biofuels and products in a downstream fermenter. Joshua completed the bulk of his dissertation work at the Department of Energy-National Renewable Energy Lab, USA and is now a Postdoctoral Research Associate at Princeton University.

Title: Microbial Catalyzed Reduction of CO2 to Biobased Products through Bio-electrochemical synthesis and Gas Fermentation
Supervisor: Dr S. Venkata Mohan
Affiliation: Bioengineering and Environmental Sciences Lab, Department of Energy & Environmental Engineering (DEEE), CSIR-IICT, Hyderabad, India.
Description: Non-photosynthetic biological methods of CO2 sequestration viz., bio-electrochemical systems (BES) and gas fermentation (GF) systems were explored for reducing CO2 into several value-added biobased products (dominantly acetate) through selectively enriched chemolithoautotrophic homoacetogenic bacteria as biocatalyst for addressing the dual issues, i.e. climate change and energy demand. This work is focused to study and analyze the mechanism of CO2 reduction by linking the biological and electrochemical interface with an emphasis on electron transfer from microbe towards electrode and vice versa (electrotrophy), and optimization of process parameters (pH, electrode materials, microbiome community, headpace pressure) towards enhancing the process efficiency with simultaneous products synthesis in view of sustainability

Dr. Indrasis Das

Title: Optimisation of microbial electrochemical systems for nutrient recovery from source-separated urine
Supervisors: Dr Pablo Ledezma, Dr Ludwika Nieradzik, Dr Stefano Freguia, Dr Bernardino Virdis
Affiliation: Advanced Water Management Centre, University of Queensland, Brisbane, Australia
Description: This thesis addressed the optimisation and the challenges encountered towards the implementation of bio-electroconcentration systems for the recovery of nutrients from source-separated urine. It deepened the understanding of the technology's performance and practically established the superiority of a source-separated urine substrate over domestic wastewater. This study also determined the fate of inherent pharmaceutical parent compounds and their human metabolites during the hydrolysis of urine and, for the first time, within the system.

Dr. Juliette Monetti

WISMET Seminars Soon !

WISMET helps create professional connections to female researchers, and is a forum to reach out to others that understand the unique work/life demands of female scientists. Starting in May WISMET is organising a seminar series that will be to highlight research by grad students and postdocs across our international community.

If interested in giving a seminar, please contact Sarah Glaven: sarahglaven@gmail.com or Catarina Paquete, cpaquete@itqb.unl.pt - up-to-date ISMET membership needed.

If you want to be part of WISMET please go to https://groups.io/g/W-ISMET to subscribe, or contact Sarah Glaven,sarahglaven@gmail.com.

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ISMET news *is a semi-annual publication from the ISMET International Society for Microbial Electrochemistry and Technology.*