



BIANNUAL NEWSLETTER

GREETINGS FROM THE NEW EDITOR

Hello ISMET Newsletter Readers, my name is Liz, and I am the newly appointed editor of the ISMET Newsletter. I currently work as a Research Fellow at Newcastle University in the UK. I have been hooked on the fascinating world of microbial electrochemistry since doing my masters dissertation in 2008. I think we are fortunate to be in such an exciting field of research, and have the ISMET society to be part of. I am delighted to be writing my first editorial, and look forward to working with you all to continue the success of this publication.

The ISMET Newsletter has been running since March 2013, after the foundation of the ISMET Society in 2011. It is pleasing that in a time of immediate and fully connected news sharing that we as a community have this written letter where views, ideas and information can be given in more than a 280 character tweet, and hopefully readers will give more time to digest. This newsletter gives us the space to have both a professional and personal reflection on our work and connections with each other. I believe written news has great power, and still an important place in the world. Recently my mum found a stack of old letters I had written to her from my undergraduate University – her tidying was halted for the day as she became enthralled in re-reading them, such is the power of written news. Thus I am pleased to have been given this role. So although my editorials will not contain complaints about having to do C++ programming, nor will they be handwritten as you might all then struggle to decipher my hieroglyphs, I will however include a few of my little sketches here and there to break up the text and hopefully raise a smile.

In this issue of ISMET news there is a sneak preview of the terminology survey from our president Sarah Glaven, full details to follow in the 2020 New Year's edition. We have an article about the upcoming ISMET 7 International Conference taking place on October 7-11.2019, at OIST, Okinawa, Japan. We are also pleased to congratulate the new graduates, receiving their PhD's in our ever diversifying and expanding field of research.

Liz Heidrich
Editor ISMET Newsletter



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Contributions please:

The success of the ISMET newsletter relies on you, so please do send in any articles, ideas or comments.. The 18th newsletter edition will be published in the New Year and will contain full details of the nomenclature survey. I would also like to have a feature with some stories and reflections about public engagement work that you have carried out. If you have something to contribute, or know of someone who has, then please drop me an email to discuss further.

It is always fascinating to see the response people and especially children have to our unusual work. Recently, when involved in creating a play with 8 year olds on climate change, I was asked for three adjectives to describe a Geobacter - I plumped for **resourceful**, **strong** and **social** –any other ideas to **#ISMETnews**



Assistant editor needed:

Finally, a plea for help. We are looking for an assistant editor to help to with the production of this letter and getting it out to our readers. The position will either to overlap with, or succeed the editor position so that there can be a seamless transition after my two years in this role. Ideally the person should be my opposite, meaning well organised and tech savvy, failing that just enthusiastic would do. If you feel you would like to help sustain and build on the success of ISMET news please send me an email to discuss the opportunity, or come and find me at ISMET7.



SNEAK PEAK: ISMET TERMINOLOGY SURVEY

Several months ago we reached out to the ISMET community to ask for your valued feedback on terms commonly used by ISMET researchers. The ISMET survey was conducted to get a general sense of the preferred terms used by researchers in the field of microbial electrochemistry and electromicrobiology. As the field grows and becomes inclusive of additional disciplines (e.g. bioelectronics and synthetic biology), it is incumbent upon the ISMET to put forward recommendations on terminology that can help researchers communicate with each other, as well as to communicate better to other fields.

The survey considered terminology in 4 areas: The Field, The Process, The Technology, and The Microorganisms

The principles for choosing terminology were:

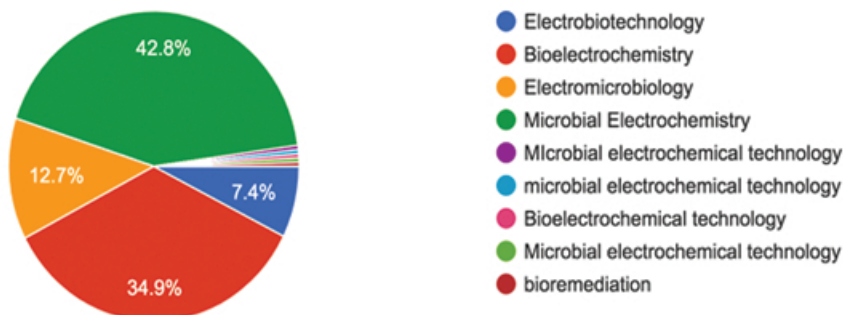
1. A term needs to make scientific sense, thus the term needs to have a clear definition
2. The term needs to be consistent with existing scientific terms from other fields such as microbiology or electrochemistry
3. The number of different terms should be limited to the strictly necessary

The survey was distributed to an estimated >300 researchers that are actively involved in ISMET and receive the ISMET newsletter, are ISMET members, or have been to an ISMET meeting in the last year. 231 responses were recorded for each question, demonstrating a >75% response rate for the survey. Respondents represent students, postdocs, early career and established researchers in ISMET. The ISMET is active and passionate!

What's next? The ISMET board is reviewing the results of the survey and we plan to make them available at or after ISMET7 on the ISMET website. We recognize that terms are only useful if they are adopted by a field and any recommendations on the use of preferred terms are meant to be helpful, not prescriptive. Below is a sneak peek of the results where we asked respondents to choose a term that best describes research performed by the ISMET community. Thank you all so much for your participation.

Choose 1 term that you feel best describes research performed by the ISMET community:

229 responses



Authors:
Sarah Glaven and Korneel Rabaey

ISMET 7 GLOBAL CONFERENCE



Dear Colleagues,

It is our great pleasure to welcome you to the forthcoming General Meeting of The International Society for Microbial Electrochemistry and Technology (ISMET7) which will be held from October 7 to 10, 2019 in Okinawa, Japan at the Okinawa Institute of Science and Technology Graduate University (OIST).

ISMET7 will be a great conference for sharing the latest insights of academic and industrial research as well as to experience the unique environment of Okinawa, a unique cultural tropical paradise of beaches and jungles.

The conference allows a broad array of topics, such as Bioremediation, Microbial ecology as well as Materials to stimulate further cooperation across the cultural borders, and to facilitate the commencement of new research-lines in the field.

In addition to the main conference meeting, ISMET7 offers an optional two-day workshop with teaching sessions delivered by renowned leaders in the field on the following topics:

- Demonstration of MFC-fueled autonomous robot, EcoBot II by Prof. Ioannis Ieropoulos & Dr. Maria Jose Salar & Dr. Pavlina Theodosi.
- Reactors for microbial electrochemistry by Dr. Deepak Pant
- Wisely using electrochemical methods and deciphering thermodynamic fundamentals of microbial metabolism by Dr. Falk Harnisch & Dr. Benjamin Kort.
- Biofilm fundamentals and electrochemical detection of early biofilm formation by Enrico Marsili.

The workshops are offered in parallel from 10–11 October 2019.





ISMET 7 GLOBAL CONFERENCE

Plenary Speakers

Yujie Feng, Harbin Institute of Technology, China.

Mirella Di Lorenzo, Bath University, UK.

Ioannis Ieropoulos, Bristol BioEnergy Centre
Bristol, United Kingdom.

Stefano Freguia, University of Queensland,
Advanced Water Management Centre, Australia.

Sebastia Puig, University of Girona (Spain)

Shunichi Ishii, Japan Agency for Marine-Earth
Science and Technology. Yokosuka, Japan

Yuri Gorby, Rensselaer Polytechnic Institute, New
York.

Sessions:

I: Microbial ecology: enzymatic and metabolic pathways in microbial electrochemistry.

II: Materials: electrodes and membranes for BES.

III: Fundamentals of Extracellular electron transfer.

IV: Bioremediation, wastewater treatment and nutrient recovery.

V: Bioelectrochemical systems: application towards commercialization.

VI: Bioelectrosynthesis and electrotrophic microbes.

The deadline for payment for persons that have a poster or oral presentation is 15 September 2019. Failure to pay the required amount on this date will result in the exclusion of the poster or presentation from the Conference.

A free shuttle bus between Naha airport, the conference venue and hotels nearby will be provided to Ismet7 participants. Please note that this service requires a reservation before 30 September 2019.

We thank you for your participation and look forward to seeing you in Okinawa, Japan.



Ismet 7 Local Organizing Committee,

<https://www.ismet7.com>

**Okinawa Institute of Science and
Technology (OIST)**



profiles ::
THE NEW PhDs

Title: Bioelectrochemical systems for groundwater denitrification

Supervisor: Andrea G. Capodaglio

Affiliation: University of Pavia, Italy

Description: Daniele studied the application of bioelectrochemical systems for the removal of nitrate from groundwater, focusing on operational conditions and energy consumption of biocathodes in in-situ and ex-situ configurations. During his PhD he spent 8 months working at Virginia Tech (Blacksburg, VA, USA) under the supervision of Prof. Zhen (Jason) He.



Daniele Cecconet

Title: The effect of complex feed on Bioelectrochemical systems (BESs) performance

Supervisors: Prof. Tom Curtis, Dr Jan Dolfing, Dr Elizabeth Heidrich

Affiliation: Newcastle University, United Kingdom.

Description : My PhD thesis was to understand the effect of the complex composition of wastewater on bioelectrochemical systems through a series of case studies that using glucose and sulphate as example of complex organic substrate and alternative electron acceptor other than electrode respectively at different anode potentials. This study provides detailed information of the effect of the complex components on the electrogenic performance of BESs and the effect of anode potential on the major electrogenic pathways of these complex components in BESs.



Fei Zhao

Title: Microbial electrosynthesis: Anode-and cathode-driven bioproduction of chemicals and biofuels (<https://espace.library.uq.edu.au/view/UQ:14a3a92>)

Supervisors: Jens O. Krömer, Pablo Ledezma, Bernardino Virdis, Stefano Freguia

Affiliation: Advanced Water Management Centre, University of Queensland, Brisbane, Australia

Description: After receiving a Master of Science in Chemical Biology from the Technical University of Dortmund, Germany, I enrolled for a Ph.D. program at the University of Queensland, Australia. The focus of my Ph.D. was anodic and cathodic microbial electrosynthesis for sustainable production of biofuels and commodity chemicals. This thesis describes how to drive electrochemically a desired metabolic production route in a cell by empowering microorganisms to use an anode as an electron sink or a cathode as an electron source in a bioelectrochemical system.



Igor Vassilev

profiles ::
THE NEW PhDs

Title: Microbial electrolysis cells with both anode and cathode catalysed by microorganisms

Supervisors: Prof. Dr. Keith Scott & Dr. Eileen Yu

Affiliation: Newcastle University, UK

Description: The project was mainly focused on the study of bioelectrode behaviour and their interaction in a microbial electrolysis cell. Optimisation strategies were also studied in order to control the bioelectrode catalytic activities that could increase hydrogen production and decrease power input.



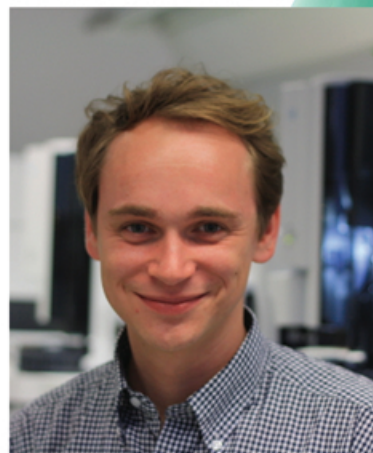
Lim, Swee Su

Title: Towards the coupling of electrochemical CO₂ reduction with microbial biosynthesis

Affiliation: Helmholtz Centre for Environmental Research – UFZ & University of Leipzig

Supervisor: Falk Harnisch

Description: The reproducible production of format at bioprocess-compatible conditions was engineered and systematically studied at 50 mL scale. The process was scaled-up to 1 L electrobioreactors, which allowed the in-situ coupling with microbial biosynthesis of valuable products (i.e., medium-chain carboxylates and dicarboxylates).



Richard Hegner

Title: Environmental and experimental evaluation of producing chemicals from CO₂ using bioelectrochemical systems

Supervisors: Dr Sharon Velasquez-Orta, Dr Paul Sallis and Dr Anh Phan

Affiliation: Newcastle University

Description: This thesis aimed to environmentally evaluate and empirically investigate the synthesis of useable chemical from CO₂ through microbial electrosynthesis (MES). Life cycle assessment was used to model the environmental impacts of deploying MES on an industrial scale. The findings furthered our understanding on the main products to target when MES is potentially scaled up.



Tobechi Okoroafor

Title: Granular Activated Carbon in Capacitive Microbial Fuel Cells

Supervisor: Annemiek ter Heijne

Promotor: Cees Buisman

Affiliation: Wageningen University

Description: This PhD was focused on the study of granular activated carbon for bioanodes, i.e. the combination of porous electrode and bacteria. The ultimate goal of this technology is based on the production of electricity from a wastewater treatment process, where the granular activated carbon is able to act as current collector but also as an electrical-double layer capacitor for charge storage purposes. Leire obtained her degree in June 2019. Currently, she is working as a postdoctoral researcher at CIC energiGUNE energy and cooperative research centre (Vitoria, Spain) with main focus on the post-mortem analysis of (aged) commercial batteries and supercapacitors.



Leire Caizán Juanarena

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