

Mini-symposium on Education and Outreach on Microbiology

Swiss Society for Microbiology Annual Congress 2016

Bern, Switzerland



DAY 1 (14.06.2015) - 14h30-15h30 (Foyer Nord) - Making the Bridge: talking about Epidemic Outbreak to the Broad Public

KEYNOTE SPEAKER

14h30 -15h00 M. Christen Darcy, Director of SAM (Service d'appui multimédia), Centre Hospitalier Universitaire Vaudois, CHUV

Title: **Perception is Reality**

For decades, professional communicators were convinced that their power would last forever. Whatever they would send to the public through traditional mass communication tools would be what the public would get. The dominant paradigm was the so-called « push » model, the sender pushing its message to the public in attempts to « manufacture consent » (Lippmann - 1920, Herman & Chomsky - 1988).

The emergence of the internet, social networks and the spectacular development of mighty search engines has drastically changed the paradigm: the power is now in the hands of the receiver, thanks to the « pull » model. The public can search and pull information that it deems truly relevant, it can crosscheck and share it freely and therefore bypass media gatekeepers. This much faster than anytime before in history.

In a crisis situation, where the fear factor often prevails, perceptions are now built much faster than actual experiences of reality. The expectations of the public to be adequately informed are also much higher than before. For

the communicator, there is no alternative: transparency and credibility are the only effective recipes for success. The challenge in communication is not anymore to format a message, it is to understand early enough how this message will be received by the public.

Darcy Christen has worked 15 years as a corporate spokesman, often in crisis situations. He is currently head of the multimedia service of the Lausanne University Hospital (CHUV).

CONTRIBUTED TALKS

15h00 - 15h15 Dr. Patrick Linder, Professor of Microbiology, Director of the Department of Microbiology and Molecular Medicine University of Geneva Medical School, President of the Biology Platform, Swiss Academy of Science.

Title: **Microbiology Day: a true 10-years experience from Geneva**

On the news, journals, magazines and in the streets, laypersons are continuously overwhelmed with worrisome information and apocalyptic perspectives about microbes. As a consequence, the hidden world of microbiology is very often only associated with dangerous diseases or nasty contaminants. On the contrary, although some microbiological topics must be addressed with the proper concern (e.g. antimicrobial resistance), microbiology can be a marvelous land to be discovered with amazing landscapes and new dimensions to be explored.

Launched for the first time in 2007 by the communication platform for life sciences, called

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BiOutils (University of Geneva, UNIGE), the Microbiology Days want to reduce this gap between concerns and reality. Planned as an annual event, the Microbiology Days take place in the city of Geneva and aim to bring microbiology closer to laypeople. Each year, every event is designed to focus on a social-relevant topic of microbiology (e.g. Microbes: a threat or a new hope?; Microbes and humans: intimate relationship; Viruses without borders), so that seminars, workshops, laboratory visits and discussions may be proposed to the broad public. Thanks to the support of the Faculty of Medicine and the Faculty of Science (UNIGE), 200-350 citizens (on average) attend to these organized events.

In 2017 the 10th Microbiology Days will take place in conjunction with the 10 years of BiOutils. While preparing special events that will be held during such an exciting celebration, this presentation will focus on the foundation, challenges, satisfactions and perspectives of the Microbiology Days, described by one of its original founders, Prof. Patrick Linder.

15h15 - 15h30 **Dr. Daniela Pires** - Dr. Pittet Group - Infection Control Programme and WHO Collaborating Centre on Patient Safety - Infection Control & Improving Practices, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland - Department of Infectious Diseases, Centro Hospitalar Lisboa Norte and Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal

Title: **Clean Care is Safer Care: achieving patient and public safety**

Outbreaks are inherently unpredictable. There is no possible way to be ready for an unpredictable event. In this context, having a preparedness plan is the only way to be able to mount an adequate response when needed. Correct perception of an outbreak by the public, stakeholders and policy makers is essential for its management. Indeed, misunderstanding the magnitude or the scope of outbreaks can lead to lack of directed action by leaders and stakeholders. Moreover, misconceptions by the public can lead to dramatic consequences, such as non-compliance with recommendations, panic reactions, harassment of healthcare teams and patients or even complete social disruption.

Effective communication is thus essential. The World Health Organization (WHO) developed a guidance document on best practices for communicating with the public during an outbreak. It established five essential practices: building trust, announcing early, being transparent, respecting public concerns, and planning in advance. The recent West Africa Ebola epidemic is a paradigmatic case in various ways. First, it demonstrated the fragility of world leadership to deal with large scale, fatal outbreaks. This was in part due to leadership's poor perception of the real magnitude of the problem in its early stages. Second, this outbreak took place in an interconnected world. Communication takes place through channels not easily managed by authorities and at very high

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speed. Social media tools as Facebook®, Tweeter® and Instagram® are instantaneous, constantly updated, lively and open sources of information. This creates endless opportunities but also enormous challenges regarding the quality and flux of information.

Our Infection Control Programme and WHO Collaborating Centre on Patient safety team has been working for a decade with WHO to spread the word on Infection Control and Hand Hygiene Promotion. Healthcare ministers of more 139 countries have pledge to take action to reduce healthcare-associated infections through hand hygiene promotion, transforming this programme on the most successful ever in WHO. Most importantly, implementation of the Geneva model of hand hygiene promotion is a reality in the most well equipped healthcare institutions in developed countries as well as in the deprived health facilities in sub-Saharan countries. Communication has been and still is critical to face this challenge. Indeed, "Clean Care is Safer Care" was only made possible through the effective communication of scientific evidence that not only addressed common problems but also common solutions. Building trust in partnership and empowering people is the best way to achieve a common goal: patient and public safety.

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DAY 2 (15.06.2015) - 14h30-15h30 (Foyer Nord) - From the lab with love: how to promote scientific education using microbiology

KEYNOTE SPEAKER

14h30-15h00 **Dr. Joanna Verran**, Professor of Microbiology, National Teaching Fellow; Head of School of Research, Enterprise and Innovation; Head of Science Communication and Public Engagement in the Faculty of Science of the Manchester Metropolitan University

Title: **Mixed cultures: engaging the public with microbiology using the arts and humanities**

Students should be enthusiastic and informed ambassadors for their chosen subject, able to communicate at a level appropriate to a given audience. I believe that such engagement is achieved by utilising other disciplines perceived to be more accessible. Thus, throughout my career I have introduced innovative exercises to the undergraduate curriculum with the aim of helping students to connect their microbiology studies with the world outside the University.

Initially, I introduced project group work where students were given a brief from an external client to design a form of public information – a leaflet, video or poster. The pitches, and the work, were peer-assessed, client-assessed and tutor-assessed, and on occasion used by the clients. Later, I gave an annual overview lecture to over 250 first year undergraduates (studying

microbiology) on the links between microbiology and art (deterioration of cultural heritage, the beauty of microorganisms, the impact of disease on classical art, the emergence of sci-art projects, and so on). For the (optional) assignment, students were asked to develop a creative output that linked microbiology and art, preceded by negotiation of assessment criteria with me. The outputs revealed impressive creativity, utilising students' interest in fashion, art, photography, baking.

In 2009, I set up the 'Bad Bugs Bookclub', a group of scientists and non-scientists who read novels where infectious disease forms part of the plot. Seven years and over 40 books later, the website is a rich resource of reading guides and reports, and suggestions for accompanying activities (movie screenings, guided walks, exhibitions), for use with a range of audiences, including students. I have also delivered a range of literature-associated activities for children. A particular focus was the use of vampires and zombies as agents of infection. I used a range of novels to illustrate the principles of disease transmission, and, with a computer scientists PhD student, developed a game 'SimZombie' to illustrate how different parameters can affect the spread of infection.

My underlying philosophy to this work is the improvement of science literacy in my audiences, and the development of creativity and communication skills in my students. I have published my work on microbiology education in peer-reviewed journals as well as my laboratory-

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focused research, in order to raise the profile of discipline based education research, but also to share my findings with colleagues, and to encourage them to do likewise.

CONTRIBUTED TALKS

15h00 - 15h15 **Dr. Carole Kebbi**, Dr. Greub Group - Center for Research on Intracellular Bacteria (CRIB), Institute of Microbiology, University Hospital Center and University of Lausanne, Lausanne, Switzerland

Title: **Playing with microbes: developing a game to enhance the population knowledge on the threats and prevention opportunities related to emerging pathogens**

In the past decades, important changes occurred in habits and lifestyle of the Swiss population as well as in climatic conditions worldwide. These changes provided new opportunities for microorganisms to emerge as pathogens and enhanced the risks for the population to get in contact with them. In addition, recent advances in microbiology techniques, such as metagenomics or improved culture conditions, allowed the discovery of several new bacterial species, some of them with significant impact on human health.

To inform the general population about emerging pathogens, we intend to create and develop, in collaboration with a game designer and communication professionals, a completely new and innovative board game. Currently available games on emerging pathogens mainly stimulate

anxiety and exaggerated fears, our newly developed game will conversely convey a balanced, unbiased and scientifically strong message. We will focus on different aspects related to emerging pathogens such as their reservoirs and vectors, their mode of transmission, real risks to get infected, prevention opportunities, symptoms of related diseases and existing treatments. This communication will also deliver the key messages that many microbes remain to be discovered, that most new pathogenic microbes have been identified during large outbreaks and that research may help identifying these microbes before they cause large suffering in humans. And so, this project will also increase awareness of the general population on the importance of performing research in microbiology.

This new game will be the support of extended interactions with the public since it will be launched together with a cycle of general audience conferences, given by proficient microbiologists, that will particularly emphasize three modes of transmission of these new pathogens i.e. by arthropod bites, by exposure to mammals, birds or reptiles and by exposure to water aerosols (humidifiers, air conditioning systems). Interaction with the public will also take place thank to an active collaboration with game libraries and to the organisation of "game evenings" followed by open discussions with scientists.

15h15 - 15h30 **Dr. Karin Kovar**, Head of the Bioprocess Technology Centre, Institute of

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Chemistry and Biotechnology, School of Life Sciences and Facility Management, Zurich University of Applied Sciences ZHAW

Title: **New business opportunity (NBO) in microbial biotechnology: An innovative educational programme**

The potential for using microbial biotechnology is not fully exploited in many markets for products such as chemicals, dietary supplements, cosmetics, foods, or animal feed. This knowledge gap is challenged by the NBO, which was launched in 2010 and conferred Best Teaching Award 2015 by the ZHAW. This teaching/learning concept was developed for students in the Master's programme in Pharmaceutical Biotechnology and aims to impart cross-disciplinary knowledge and develop competencies necessary to initiate, evaluate and implement a viable new product or process idea in the field of microbial biotechnology. The didactic concept facilitates collaboration between academia and industry and promotes the introduction of "green technologies" into the Swiss economy.

The close interaction with industry practitioners as topic owners and/or coaches of the student teams is highly appreciated. Industry partners may become inspired by opportunities to substitute their traditional production technologies with more sustainable biotechnological processes and are offered a multi-perspective analysis involving technological, financial, regulatory and ecological issues.

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POSTER SESSIONS (14-15.06.2016)

Poster session I - 14th June -- 14h00-14h30

Poster Session II - 15th June -- 14h00-14h30

POSTER LIST

Title: **miwelt: Discover the hidden world of microbes**

M Raabe², V Looser¹, M Ottinger¹, K Hecht¹, M Straumann¹, C. Ulli¹, J Dürr³, and K Kovar¹

¹ School of Life Sciences and Facility Management LSFM, Zurich University of Applied Sciences ZHAW, Wädenswil, Switzerland

² independent journalist, Leipzig, Germany

³ freelance children's books illustrator, Berlin, Germany
schreib@miwelt.net

The miwelt project – funded by the Agora instrument of the Swiss National Science Foundation – uses an innovative didactic approach, a combination of arts and science, to familiarise children from 7 to 11 years with concepts in microbial biotechnology. Using everyday experiences packaged as short stories, their curiosity will be stimulated. Thematic excursions provide insights into microbial habitats, and experiments performed in real laboratories explore microbial behaviour. This concept continues to develop in teaching aids and lab-books illustrating experiments that can be repeated at home or at school with little equipment.

The people in miwelt open a dialogue that encourages scientists to explain, using simple terms and illustrations, why their work on microbial systems is important and how it becomes the scientific foundation for applications in industrial manufacturing. Although primarily child-centred, the concept is also an asset to adults who lack a strong scientific background.

Title: **BiOutils: microbiology for everyone!**

M Caine¹, A Weber¹, S Zuchuat¹, V Ducret¹, P Linder², K Perron¹

¹Microbiology Unit, Department of Plant Biology 30, University of Geneva, Quai Ernest-Ansermet Geneva 4 CH 1211, Switzerland, ²Department of Microbiology and Molecular Medicine, Medical Faculty, University of Geneva, 1 Rue Michel Servet, Geneva 4 CH 1211, Switzerland

Created by researchers, BiOutils is an interface that aims to promote and support the study of biology in schools. The platform provides schools with protocols, material and know-how to perform modern and engaging experiments in class, with activities ranging from ecology to modern molecular biology.

Its innovative edge, compared to other structures that offer educational activities in the field of science, is the fact that the platform is fully integrated in a university research group. Therefore, experimental methods and material provided are always up-to-date with the latest technological and scientific advances.

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Title: **Getting to know microbes: outreach activities in the Piora Valley**

A. Weber¹, M. Caine¹, C. Fragoso-Corti^{2,3}, A. Spinelli⁴, R. Bachofen⁵, G. Pellegrini⁶, D. Sartori⁷, M. Tonolla^{1,2,3}, R. Peduzzi^{1,3}, K. Perron¹, P. Linder¹

¹ BiOutils, University of Geneva

² Laboratory of applied microbiology, University of applied sciences Southern Switzerland, Bellinzona

³ Fondazione Centro Biologia Alpina, Piora

⁴ Pura, Ticino

⁵ University of Zurich

⁶ Ideatorio, USI, Università della Svizzera italiana

⁷ Ufficio dell'insegnamento medio superiore, Cantone Ticino

The largest part of the planet's living material consists of bacteria and other microorganisms that play a vital role in many biological processes. In spite of their huge importance and beneficial effects, microorganisms are largely unknown and mostly negatively perceived. Microbiology has many industrial, medical and environmental applications and it is necessary that society gets an accurate knowledge of microbes and their influence. In this context, outreach activities that address the public are crucial, to give a better understanding of this hidden world.

The aim of the present project is to raise awareness about the importance of microorganisms in preserving biological and ecological systems, by offering to the public and schoolchildren in particular the opportunity to see

microbes and learn about their metabolism, ecology and utility. To this purpose, a "microbiological path" will be developed in the exceptional environment of Val Piora in Ticino, where several colonies and specimens can be observed directly in nature. It will show that microorganisms are present in the environment and can be seen, in some cases, without any special equipment. For example, the algae *Haematococcus pluvialis* and the bacteria *Chromatium okenii* form very distinct red coloration in the water. To guide the visitors along the didactic path, informative material will be available, such as a descriptive leaflet and panels. Visits and activities with local experts will also be organized for schools, to provide complementary education about microbes.

This Agora project is supported by the FNS