

Curriculum vitae

Personal Information

Marc Jean-Frédéric Suter

Deputy Department Head, Environmental Toxicology
Eawag, Swiss Federal Institute of Aquatic Science & Technology
Überlandstrasse 133, 8600 Dübendorf, Switzerland

Phone: +41 58 765 54 79

e-mail: marc.suter@eawag.ch

web: <http://www.eawag.ch/en/department/utox/organisation/bioanalytics/>

OrcID: orcid.org/0000-0003-3762-3490

ResearcherID: I-2074-2013

Google Scholar ID: EZVhTSEAAAAJ

H-Index: h-34 (Google Scholar, 25.09.2018)

Languages: German, French, English

Education

University of Bern, PhD in Natural Sciences, 10. November 1988

University of Bern, MSc, Chemistry, 4. November 1982

Employment History

2005 – present	Deputy Department Head, Environmental Toxicology, Eawag, Dübendorf, CH
2004 – 2005	Sabbatical Leave, J Yates, The Scripps Research Inst., La Jolla, CA, USA
2000 – 2004	Department Head, Analytical Chemistry of the Aquatic Environment, Eawag, Dübendorf, CH
1996 – present	Research Group Leader, Eawag, Dübendorf, CH
1991 – 1996	Research Fellow, Eawag, Dübendorf, CH
1988 – 1991	Post-doctoral researcher, R Caprioli, Univ. of Texas, Health Science Center, Houston, TX, USA.
1983 – 1988	Research Assistant, Organic Mass Spectrometry, Univ. of Bern, CH

Institutional Responsibilities

Head of the analytical commission, Anakom of Eawag since 1995 (manages analytical quality control measures, acquisition of new research equipment, repairs and maintenance of research equipment).

Chief Safety Officer, Eawag Dübendorf since 2016.

Approved Research Projects (since 2008)

Swiss National Science Foundation: 3 as co-applicant (CHF 917'623)

EU: 2 as co-applicant (CHF 615'000)

SCIEX-NMS^{ch}: 2 as PI (CHF 111'700)

FOEN: 5 as PI (CHF 444'112)

Eawag discretionary funds: 4 as PI (CHF 409'500)

Supervision of Junior Researchers (since 2008)

Supervision of PhD theses:

C Vögeli 2008, H Nestler 2012, P Macikova 2012, S Longfei 2014, A Hidas 2016, I Oliveira 2017, A Tierbach (ongoing), Julie De Oliveira (ongoing)

and of MSc Theses: F Hamdane, P Richle, T Bruderer, J Krismer, J Maner, C Erhart

External examiner: J Reinen 2012

Supervision of Postdocs: V Nesatyy (-2008), N Lamari (-2013), D Jancula (2014), K Groh (-2015), B Fischer (-2016), F Rouholahnejad (-2017), V Rullaud (2017).

Supervision of Scientific Staff: R Schönenberger, S Ammann, S Salzmann, U Lindauer (ongoing), J Keist (-2018), A Ammann (-2015).

Teaching Activities (since 2008)

2007-2014, analysis of organic pollutants (ETHZ, 701-1332-00L, with J Hollender, H Singer)
NATO Advanced Study Institute (2013, 2016)
Since 2013, advanced ecotoxicology (ETHZ, 701-1312-00L, with R Eggen, K Schirmer, E Janssen)
Since 2016, term paper writing (ETHZ, 701-1303-00L, organized by M Schroth)

Members in Panels and Boards and Reviewing Activities (since 2008)

Evaluation panel of the Agence National de la Recherche, F (2008, 2011, 2012)
Reviewer for the Italian Ministry for Education, University and Research, I (2011, 2013)
Reviewer for the Research Grants Council, Hongkong, CN (2012)
Reviewer of ETHZ instrument grants (2013, 2014, 2016, 2017, 2018)
Reviewer for the European JPI Oceans Call (2015)
Reviewer for Rovaltain, F (2015)
Reviewer for National Science Centre, PL (2016)
Reviewer for Research Foundation Flanders, BE (2016)
Reviewer for the Agence national de la Recherche, F (2017)
Review panel for the Canada Foundation for Innovation, CA (2017)

Guest Editor *Analytical and Bioanalytical Chemistry*, Springer (2008)

Review of book proposal for Wiley (2010)

Since 2017, International Advisory Board of *Analytical and Bioanalytical Chemistry*

Various paper reviews for:

Anal Bioanal Chem, Anal Chem, Aquat Toxicol, Chemosphere, Ecotox Environ Safety, Environ Microbiol, Environ Sci Nano, Environ Sci Technol, Environ Toxicol Chem, Indust Eng Chem Res, J Chromatogr, J Mass Spectrom, J Proteome Res, Rapid Commun Mass Spectrom, Separations, Wat Environ Res, Wat Res

Active Membership in Scientific Societies

1997-2014 board member *Swiss Group for Mass Spectrometry* (SGMS)

Since 2005 board member *Division Analytical Sciences* (DAS) of the *Swiss Chemical Society* (SCS)

2008-2014 president of the SGMS

2008-2014 Swiss affiliate of the *International Mass Spectrometry Foundation*

2012-2014 member of the SGMS international award panel

Since 2009 member of the *Swiss Proteomics Society*

Since 2015 member of the SCS award board

Since 2016 member and head (alternating) of the *Swiss Academy of Sciences* travel award selection committee

Since 2016 president of the DAS of the SCS and Simon-Widmer award panel

Since 2017 member of the SCS board of directors

Since 2017 member of the *Swiss Metabolomics Society*

Organisation of Conferences (since 2008)

1997 – 2014 organization and chairing of the SGMS annual meeting

2009, session organization and chairing of the *Annual Meeting of the International Association of Forensic Toxicologists*, Geneva

2012, 2014 organization and chairing the analytical chemistry session, SCS fall meeting, Zurich

2013, 2015, 2016, 2018, 2019 organization and chairing of the *CHanalysis*, Beatenberg

2014, local organizing committee, SETAC Europe, Basel

2014, co-chair (with R Zenobi, ETHZ) of the *International MS Conference*, Geneva (organization and various session chairing)

2015, organization of the Israeli Society for MS / SGMS joint meeting (with M Sharon), Rehovot, IL

2015, local organizing committee, HPLC 2015, Geneva

2016, chair, NATO-ASI, Camporo San Giovanni, I

2017, organization and chair, BioTech 2017, Wädenswil

2018, organization and chair, Effect-Directed Analysis workshop, IMSC2018, Florence, I

Major Scientific Achievements

In order to assess the adverse effects of pollutants on the ecosystem it is necessary to know their fate and behavior in various environmental compartments and ecotoxicologically relevant organisms. This requires sensitive and robust analytical techniques for their determination in very different matrices.

The bioanalytics group has successfully developed methods for the analysis of various chemicals and elements in environmental compartments, such as marine and fresh waters, wastewater and treated effluent, as well as various culturing media. It has also developed a mix-mode method that separates ionic, polar and nonpolar chemicals in one run [1]. This provides much needed measured data for fate and effect studies. Nominal data cannot be relied on, as could be shown in the case of silver ions that precipitate out of solution in the presence of chloride ions, thus reducing the actual exposure concentration for zebrafish [2]. In another case it could be shown that the investigated antifouling agent tralopyril had a very short half-life leading to an overestimation of the actual dose seen by the model organism *Mytilus galloprovincialis*. But it could also be shown that tralopyril rapidly bioconcentrates in whole mussel tissue, causing alterations on the proteome level [3]. Chemicals and elements have also been determined in other organisms and cells (e.g. zebrafish embryos, organs and tissues, diverse rainbow trout cell lines and green algae), allowing to accurately determine uptake and tissue-specific distribution of chemicals which is needed for an improved evaluation of chemical effects on model organisms and cells.

Understanding the response of an organism to pollutants requires systems-based approaches that focus on molecular events and cellular pathways perturbed or activated by the challenge. Most commonly, this is done on the transcriptome level, but more recently, proteomics has been added to the systems-biology toolbox [4-6]. By integrating transcriptomics, proteomics and physiological data, the bioanalytics group together with colleagues from Utox could show that green algae adapt to silver exposure up to a certain level, but succumbed once this threshold was overpassed. The initiating event was found to be the breaching of the cell membrane via copper transporters. Once inside the cell, silver inactivates key enzymes, which ultimately leads to the formation of reactive oxygen species, causing lipid peroxidation and other damage. At low concentrations the antioxidant response of the cell and increased efflux of silver through the efflux pumps is adequate for recovery [7]. In addition to green algae, the bioanalytics group has extensively been using targeted and global proteomics techniques to monitor changes on the proteome level, for instance during development of zebrafish [8, 9], to distinguish its male and female gonads [10], after an external challenge [11, 12] or under nutrient limitation [13].

1. Ammann AA, Suter MJ-F (2016) Multimode gradient high performance liquid chromatography mass spectrometry method applicable to metabolomics and environmental monitoring. *J Chromatogr A* 1456:145-151
2. Groh KJ, Dalkvist T, Piccapietra F, Behra R, Suter MJ-F, Schirmer K (2015) Critical influence of chloride ions on silver ion-mediated acute toxicity of silver nanoparticles on zebrafish embryos. *Nanotoxicology* 9 (1):81-91
3. Oliveira IB, Groh KJ, Stadnicka-Michalak J, Schonenberger R, Beiras R, Barroso CM, Langford KH, Thomas KV, Suter MJ (2016) Tralopyril bioconcentration and effects on the gill proteome of the Mediterranean mussel *Mytilus galloprovincialis*. *Aquat Toxicol* 177:198-210. doi:10.1016/j.aquatox.2016.05.026
4. Nesatyy VJ, Suter MJ-F (2007) Proteomics for the analysis of environmental stress responses in organisms. *Environ Sci Technol* 41 (20):6891-6900
5. Nestler H, Groh KJ, Schönenberger R, Eggen RI, Suter MJ-F (2012) Linking proteome responses with physiological and biochemical effects in herbicide-exposed *Chlamydomonas reinhardtii*. *J Proteomics* 75:5370-5385
6. Groh KJ, Suter MJ-F (2015) Stressor-induced proteome alterations in zebrafish: a meta-analysis of response patterns. *Aquat Toxicol* 159:1-12
7. Pillai S, Behra R, Nestler H, Suter MJ-F, Sigg L, Schirmer K (2014) Linking toxicity and adaptive responses across the transcriptome, proteome, and phenotype of *Chlamydomonas reinhardtii*

exposed to silver. Proceedings of the National Academy of Sciences 111 (9):3490-3495.
doi:10.1073/pnas.1319388111

8. Groh KJ, Schoenenberger R, Eggen RI, Segner H, Suter MJ-F (2013) Analysis of protein expression in zebrafish during gonad differentiation by targeted proteomics. Gen Comp Endocrinol 193:210-220

9. Tierbach A, Groh KJ, Schöenenberger R, Schirmer K, Suter MJ-F (2018) Glutathione S-transferase protein expression in different life stages of zebrafish (*Danio rerio*). Tox Sci 162, 702-712. doi: 10.1093/toxsci/kfx293

10. Groh KJ, Nesatyy VJ, Segner H, Eggen RIL, Suter MJ-F (2011) Global proteomics analysis of testis and ovary in adult zebrafish (*Danio rerio*). Fish Physiol Biochem 37 (3):619-647

11. Hidasi AO, Groh KJ, Schirmer K, Suter MJ-F (2016) Targeted proteomics to assess the response of glucocorticoidaction-related proteins after anti-inflammatory drug exposure in zebrafish (*Danio rerio*) embryos. in preparation

12. Oliveira IB, Groh KJ, Schöenenberger R, Barroso C, Thomas KV, Suter MJ-F (2017) Toxicity of emerging antifouling biocides to non-target freshwater organisms from three trophic levels. Aquat Toxicol 191, 164-174.

13. Tamminen M, Betz A, Thali M, Matthews B, Suter MJ-F, Narwani A (2018) Proteome evolution under essential resource limitation. Nat Commun *in press*.