Curriculum Vitae

Personal Information

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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 1995-2020 (manages analytical quality control measures, acquisition of new research equipment, repairs and maintenance of research equipment).
Chief Safety Officer, Eawag Dübendorf 2016-2020.

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:	5 as PI (CHF 658'700)

Supervision of Junior Researchers (since 2008)

Supervision of PhD theses:

C Vögeli 2008, H Nestler 2012, P Macikova 2012, S Longfei 2014, A Hidasi 2016, I Oliveira 2017, A Tierbach 2020, Julie De Oliveira 2020 (ABIES, Paris-Est, France), Renan Castelhano Gebara (ongoing São Carlos, Brasil)

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, 2019)
2013-2020, advanced ecotoxicology (ETHZ, 701-1312-00L, with R Eggen, K Schirmer, E Janssen)
2016-2020, 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)
2017-2019, International Advisory Board of *Analytical and Bioanalytical Chemistry*
2019-2020, Editorial Board Member of *Toxics*

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 Hazard Mater, J Mass Spectrom, J Proteome Res, Rapid Commun Mass Spectrom, Separations, Toxicol In Vitro, Toxics, Wat Environ Res, Wat Res

Active Membership in Scientific Societies
Since 1983 member *Swiss Group for Mass Spectrometry* (SGMS)
Since 1988 member *American Society for Mass Spectrometry*
1997-2014 board member *SGMS*
2005-2020 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 Societ*y
2015-2020 member of the *SCS* award board
2016-2020 member and head (alternating) of the *Swiss Academy of Sciences* travel award selection committee
2016-2020 president of the *DAS* of the *SCS* and Simon-Widmer award panel
2017-2020 member of the *SCS* board of directors
Since 2017 member of the *Swiss Metabolomics Society*

Organization 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 *CH*analysis, 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
2019, co-director and chair, NATO-ASI, Cetraro, 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] or under nutrient limitation [12]. The bioanalytics group also demonstrated the presence of the full set of cytosolic GSTs in early life stages of zebrafish [9] and the functionality of the mercapturic acid pathway [13, 14].

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. *PNAS* 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, Schönenberger 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. Editor's Highlight!
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. Oliveira IB, Groh KJ, Schönenberger R, Barroso C, Thomas KV, Suter MJ-F (2017) Toxicity of emerging antifouling biocides to non-target freshwater orgnaisms from three trophic levels. *Aquat Toxicol* 191, 164-174.
12. Tamminen M, Betz A, Thali M, Matthews B, Suter MJ-F, Narwani A (2018) Proteome evolution under essential resource limitation. *Nat Commun* 9(1): 4650-4660. doi.org/10.1038/s41467-018-07106-z
13. Tierbach A, Groh KJ, Schönenberger R, Schirmer K, Suter MJ-F (2020) Biotransformation capacity of zebrafish (Danio rerio) early life stages: Functionality of the mercapturic acid pathway. *Tox Sci* DOI: 10.1093/toxsci/kfaa073
14. Characterization of the mercapturic acid pathway, an important phase II biotransformation route, in a zebrafish embryo cell line; A Tierbach, JK Groh, R Schönenberger, K Schirmer, MJ-F Suter, *Chem Res Toxicol* DOI: 10.1021/acs.chemrestox.0c00315