

## **CARSTEN PRASSE, PH.D.**

Department of Environmental Health and Engineering

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### **MAIN RESEARCH INTERESTS**

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- Detection and occurrence of new trace organic contaminants in the urban water cycle
- Fate and transformation of trace organic contaminants in the urban water cycle and the environment
- Elucidation of transformation products of trace organic contaminants formed during biological and oxidative wastewater treatment
- Biological effects of trace organic contaminants and their transformation products at the molecular level
- Development of new methods to elucidate the exposure to toxic chemicals via drinking water.

### **RESEARCH EXPERIENCE**

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<b>Postdoc</b>	<b>University of California, Berkeley</b> Department of Civil & Environmental Engineering Advisor: Prof. David Sedlak; 02/2015 – 12/2017
<b>Postdoc</b>	<b>Federal Institute of Hydrology, Koblenz, Germany</b> Department of Aquatic Chemistry Advisor: Prof. Thomas Ternes; 06/2012 – 01/2015
<b>Visiting Scholar</b>	<b>University of California, Berkeley</b> Department of Civil & Environmental Engineering Advisor: Prof. David Sedlak; 05/2013 – 11/2013

### **EDUCATION**

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<b>Ph.D. in Chemistry</b>	<b>Federal Institute of Hydrology (BfG), Koblenz &amp; University of Koblenz-Landau, Germany</b> Supervisor: Prof. Thomas Ternes, 05/2012  <i>Antiviral drugs in the aquatic environment: Analysis, occurrence and fate</i>  Dr. rer nat. (equivalent to Ph.D.), Grade: <i>Summa cum laude</i>
<b>Diploma in Geocology</b>	<b>University Bayreuth, Germany</b> Department of Soil Sciences, Supervisor: Prof. Dr. W. Zech, 04/2008  <i>Contamination of urban soils in Addis Ababa, Ethiopia</i>

## **AWARDS**

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- Dissertation Award of the German Water Chemistry Society (2013)
- DAAD Postdoctoral Fellowship (05/2013 – 11/2013)
- ACS Certificate of Merit, 250<sup>th</sup> ACS National Conference (2015)
- SETAC New Chemist Travel Award (2018)

## **REVIEWING ACTIVITIES**

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Water Research, Science of the Total Environment, Environmental Science & Technology, Environmental Toxicology & Chemistry; Critical Reviews in Biotechnology; Analytical and Bioanalytical Chemistry.

## **PROFESSIONAL AFFILIATIONS AND SERVICE**

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- Founder and head of the working group ‘Oxidative Processes in Water Treatment’ within the German Water Chemistry Society (2013 – 02/2015; 03/2015 – present: regular member)
- Regular member of the working group ‘Anthropogenic Compounds in the Water Cycle’ within the German Association for Water, Wastewater and Waste (2013 - present)
- Member of the German Water Chemistry Society, American Chemical Society (ACS), Association of Environmental Engineering and Science Professors (AEESP)

## **PEER-REVIEWED PUBLICATIONS**

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### **2019**

Hedegaard, M.J., **Prasse, C.**, Albrechtsen, H.-F. (accepted). Microbial degradation pathways of the herbicide bentazone in filter sand used for drinking water treatment. Environmental Science: Water Research & Technology.

Schneider, I., Abbas, A., Bollmann, A., Funke, J., Oehlmann, J., **Prasse, C.**, Schulte-Oehlmann, U., Seitz, W., Ternes, T., Weber, M. Wesely, H., Wagner, M. (2019). What you extract is what you see: Optimizing the preparation of water and wastewater samples for in vitro bioassays. Water Res. 152, 47-60.

### **2018**

**Prasse, C.**, Ford, B, Nomura, D.K., Sedlak, D.L. 2018. Unexpected transformation of dissolved phenols to toxic dicarbonyls by hydroxyl radicals and UV light. Proceedings of the National Academy of Sciences 115 (10), 2311-2316.

Hedegaard, M.J., Deliniere, H., **Prasse, C.**, Dechesne, A., Smets, B.F., Albrechtsen, H.-F. 2018. Evidence of co-metabolic bentazone transformation by methanotrophic enrichment from a groundwater-fed rapid sand filter. Water Res. 129, 105-114.

### **2017**

Barazesh, J.M., **Prasse, C.**, Wenk, J., Berg, S., Remucal, C.K., Sedlak, D.L. 2017. Trace Element Removal in Distributed Drinking Water Treatment Systems by Cathodic H<sub>2</sub>O<sub>2</sub> Production and UV Photolysis. *Environ. Sci. Technol.* 52 (1), 195–204.

Brezina, E. **Prasse, C.**, Meyer, J., Mückter, H., Ternes, T.A., 2017. Investigation and risk evaluation of occurrence of carbamazepine, oxcarbazepine, their human metabolites and transformation products in the urban water cycle. *Environ. Pollut.* 225, 261-269.

## **2016**

Liu, H., Bruton, T.A., Li, W., Van Buren, J., **Prasse, C.**, Doyle, F.M., Sedlak, D.L., 2016. Oxidation of Benzene by Persulfate in the Presence of Fe(III)- and Mn(IV)-Containing Oxides: Stoichiometric Efficiency and Transformation Products. *Environ. Sci. Technol.* 50 (2), 890–898.

Funke, J., **Prasse, C.**, Ternes, T.A., 2016. Identification and fate of transformation products of antiviral drugs formed during biological wastewater treatment. *Water Res.* 98, 75-83.

Knopp, G., **Prasse, C.**, Ternes, T.A., Cornel, P., 2016. Elimination of micropollutants and transformation products from a wastewater treatment plant effluent through pilot scale ozonation followed by various activated carbon and biological filters. *Water Res.* 100, 580-582.

Barazesh, J., **Prasse, C.**, Sedlak, D.L. Electrochemical Transformation of Trace Organic Contaminants in the Presence of Halide and Carbonate Ions. *Environ. Sci. Technol.* 50 (18), 10143-10152

Maier, M.P., **Prasse, C.**, Pati, S.G., Nitsche, S., Zhe, L., Radke, M., Meyer, A., Hofstetter, T., Ternes, T.A., Elsner, M., 2016. Isotope Fractionation of Diclofenac in Environmental & Engineered Systems: Evidence of Different Oxidation Mechanisms. *Environ. Sci. Technol.* 50 (20), 10933-10942.

Ternes, T.A., **Prasse, C.**, Lütke Eversloh, C., Knopp, G., Cornell, P., Schulte-Oehlmann, U., Schwartz, T., Oehlmann, J. Integrated evaluation concept to assess the efficiency of advanced wastewater treatment processes to eliminate pollutants and pathogens. *Environ. Sci. Technol.* 51 (1), 308-319.

## **2015**

**Prasse C.**, Wenk, J., Jasper, J.T., Ternes, T.A., Sedlak, D.L., 2015. Co-occurrence of Photochemical and Microbiological Transformation Processes in Open-Water Unit Process Wetlands. *Environ. Sci. Technol.* 49 (24), 14136–14145.

Schlüter-Vorberg, L., **Prasse, C.**, Ternes, T.A., Mückter, H., Coors, A., 2015. Toxication by transformation in conventional and advanced wastewater treatment: the antiviral drug acyclovir *Env. Sci. Technol. Lett.* 2015, 2 (12), 342–346.

**Prasse C.\***, Stalter, D., Schulte-Oehlmann, U., Oehlmann, J., Ternes, T.A., 2015. Spoilt for choice: A critical review on the chemical and biological assessment of current wastewater treatment technologies. *Water Res.* 87, 237-270 (\*corresponding author).

Brezina, E., **Prasse, C.**, Wagner, M., Ternes, T.A., 2015. Why small differences matter: Elucidation of the mechanism underlying the transformation of 2OHCBZ and 3OHCBZ in contact with sand filter material. *Environ. Sci. Technol.* 49 (17), 10449–10456.

Funke, J., **Prasse, C.**, Luetke Eversloh, C., Ternes, T.A., 2015. Oxypurinol - A novel marker for wastewater contamination of the aquatic environment. *Water Res.* 74, 257-265.

#### **2014**

Oehlmann, J. Schulte-Oehlmann, U., **Prasse, C.**, Ternes, T.A., 2014. In Response: What are the challenges and prospects? An academic perspective. *Environ. Toxicol. Chem.* 33(11), 2408-2410.

Kaiser, E., **Prasse, C.**, Wagner, M., Broeder, K., Ternes, T.A., 2014. Transformation of Oxcarbazepine and Human Metabolites of Carbamazepine and Oxcarbazepine in Wastewater Treatment and Sand Filters. *Environ. Sci. Technol.* 48(17), 10208-10216.

De Laurentis, E., **Prasse, C.**, Ternes, T.A., Minella, M., Maurino, V., Minero, C., Sarakah, M., Brigante, M., Vione, D., 2014. Assessing the photochemical transformation pathways of acetaminophen relevant to surface waters: Transformation kinetics, intermediates, and modeling. *Water Res.* 53, 235-248.

#### **2013**

Benner, J., Helbling, D.E., Kohler, H.P.E., Kaiser, E., **Prasse, C.**, et al., 2013. Is biological treatment a viable alternative for micropollutant removal in drinking water treatment processes? *Water Res.* 47(16), 5955-5976

#### **2012**

**Prasse, C.**, Wagner, M., Schulz, R. and Ternes, T. A., 2012. Oxidation of the Antiviral Drug Acyclovir and Its Biodegradation Product Carboxy-acyclovir with Ozone: Kinetics and Identification of Oxidation Products. *Environ. Sci. Technol.* 46, 2169-2178.

**Prasse, C.**, Zech, W., Fisseha, I., Glaser B. 2012. Contamination and source assessment of metals, polychlorinated biphenyls and polycyclic aromatic hydrocarbons in urban soils from Addis Ababa, Ethiopia. *Toxicol. Environ. Chem.* 94(10), 1954-1979.

#### **2011**

Dabrunz, A., Duester, L., **Prasse, C.**, Seitz, F., Rosenfeldt, R., Schilde, C., Schaumann, G. E. and Schulz, R., 2011. Biological Surface Coating and Molting Inhibition as Mechanisms of TiO<sub>2</sub> Nanoparticle Toxicity in *Daphnia magna*. *PLoS One* 6.

Duester, L., **Prasse, C.**, Vogel, J. V., Vink, J. P. M. and Schaumann, G. E., 2011. Translocation of Sb and Ti in an undisturbed floodplain soil after application of Sb<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub> nanoparticles to the surface. *J. Environ. Monit.* 13, 1204-1211.

**Prasse, C.**, Wagner, M., Schulz, R. and Ternes, T. A., 2011. Biotransformation of the Antiviral Drugs Acyclovir and Penciclovir in Activated Sludge Treatment. *Environ. Sci. Technol.* 45, 2761-2769.

**Prasse, C.**, Schulz, R. and Ternes, T. A., 2011. Abbau von Acyclovir und Penciclovir in der biologischen Abwasserbehandlung. *Vom Wasser* 109.

## **2010**

**Prasse, C.**, Schlusener, M. P., Schulz, R. and Ternes, T. A., 2010. Antiviral Drugs in Wastewater and Surface Waters: A New Pharmaceutical Class of Environmental Relevance? *Environ. Sci. Technol.* 44, 1728-1735.

**Prasse, C.** and Ternes, T. A. (2010). Removal of organic and inorganic pollutants and pathogens from wastewater and drinking water using nanoparticles – A review Nanoparticles in the water cycle. F. H. Frimmel and R. Niessner. Berlin, Springer: 55-80.

Slootweg, T., Alvinerie, M., Egeler, P., Gilberg, D., Kukkonen, J. V. K., Oehlmann, J., **Prasse, C.**, Sormunen, A. J. and Liebig, M., 2010. Bioaccumulation of ivermectin from natural and artificial sediments in the benthic organism *Lumbriculus variegatus*. *J. Soils Sediments* 10, 1611-1622.

## **2009**

**Prasse, C.**, Loffler, D. and Ternes, T. A., 2009. Environmental fate of the anthelmintic ivermectin in an aerobic sediment/water system. *Chemosphere* 77, 1321-1325.

## **BOOK CHAPTERS**

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**Prasse, C.**, Ternes, T.A. Removal of Organic and Inorganic Pollutants and Pathogens from Wastewater and Drinking Water Using Nanoparticles–A Review. In: *Nanoparticles in the Water Cycle*, Springer, Berlin Heidelberg, pp. 55-79.

**Prasse, C.**, Ternes, T.A. Application of Orbitrap Mass Spectrometry for the Identification of Transformation products. In: *Comprehensive Analytical Chemistry* 71, 263-282.

## **SELECTED ORAL & POSTER PRESENTATIONS**

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**Prasse, C.**, von Gunten, U., Sedlak, D. Chlorination revisited - Tapping into unknown transformation mechanisms of phenols (poster). Gordon Research Conference Environmental Sciences: Water, June 25<sup>th</sup> -29<sup>th</sup> 2018.

**Prasse, C.**, Drew-Ford, B., Nomura, D., Sedlak, D. Linking Water Treatment to Toxicology: Reactive Transformation Products Formed During the Treatment of Phenols with UV/H<sub>2</sub>O<sub>2</sub> (poster). Gordon Research Conference Drinking Water Disinfection By-Products, July 30<sup>th</sup> – August 4<sup>th</sup> 2017.

**Prasse, C.**, Drew-Ford, B., Nomura, D., Sedlak, D. Screening for Toxic Transformation Products Formed During Oxidative Treatment of Organic Contaminants (oral presentation). 253<sup>rd</sup> National meeting of the American Society of Chemistry, San Francisco, April 2<sup>nd</sup> – 6<sup>th</sup> 2017.

**Prasse, C.**, Drew-Ford, B., Grigoryan, H., Nomura, D., Rappaport, S., Sedlak, D. Linking Water Treatment to Toxicology: Screening for Toxic Transformation Products Formed During Oxidative Treatment of Organic Contaminants (poster). Gordon Research Conference Environmental Sciences: Water, June 26<sup>th</sup> – July 1<sup>st</sup> 2016.

**Prasse, C.**, Drew-Ford, B., Medina-Cleghorn, D., Nomura, D., Rappaport, S., Sedlak, D. Linking engineering science to toxicology – Development of screening methods for the evaluation of toxic

transformation products formed during oxidative treatment of waters containing Superfund contaminants (poster). NIEHS SRP Annual Meeting, November 17<sup>th</sup> – 21<sup>st</sup> 2015.

**Prasse, C.**, Fate of antiviral compounds and their transformation products in the urban water cycle (invited oral presentation). Department of Civil & Environmental Engineering Seminar series UC Berkeley. Berkeley (California), October 9<sup>th</sup> 2015.

**Prasse, C.**, Sedlak, D., Ternes, T. Fate of antiviral compounds and their transformation products in the urban water cycle (oral presentation). 250<sup>th</sup> National meeting of the American Society of Chemistry, Boston (Massachusetts), August 16<sup>th</sup> – 20<sup>th</sup> 2015.

**Prasse, C.**, Wenk, J., Beardsley, S., Jasper, J., Ternes, T., Sedlak, D. Fate of antiviral drugs in open-water unit process wetlands (poster). Environmental Sciences: Water Gordon Research Conference, Holderness (New Hampshire), June 22<sup>nd</sup> – 27<sup>th</sup>, 2014.

**Prasse, C.**, Sedlak, D., Ternes, T. Unraveling the fate of pharmaceuticals in the urban water cycle (invited oral presentation). 29<sup>th</sup> Asilomar Conference on Mass Spectrometry, Asilomar (California), October 18<sup>th</sup> – 22<sup>nd</sup> 2013.

**Prasse, C.**, Ternes T. Challenges in elucidating the fate of pharmaceuticals in the water cycle (oral presentation). AEESP 50th Anniversary Conference, Golden (Colorado), July 14<sup>th</sup> – 16<sup>th</sup> 2013.

**Prasse, C.**, Ternes, T. Occurrence and fate of pharmaceuticals in the urban water cycle – acyclovir as case study (oral presentation). Norman Workshop, Amsterdam (Netherlands), November 29<sup>th</sup> – 30<sup>th</sup> 2012.

**Prasse, C.**, Schulz, R., Ternes, T. Occurrence and fate of antiviral drugs in the aquatic environment (oral presentation). EuCheMS International Conference on Chemistry and the Environment. Zürich (Switzerland), September 11<sup>th</sup> – 15<sup>th</sup> 2011.

**Prasse C.**, Wick, A., Ternes, T. Identification of transformation products in laboratory batch systems and elucidation of biotransformation pathways (invited oral presentation). EuCheMS International Conference on Chemistry and the Environment Satellite Event on Non-Target analysis. Zürich (Switzerland), September 9<sup>th</sup> 2011.

**Prasse, C.**, Schulz, R., Ternes, T. Biotransformation of the Antiviral Drugs Acyclovir and Penciclovir in Biological Wastewater Treatment (oral presentation). Micropol & Ecohazard Conference. Sydney (Australia), July 11<sup>th</sup> – 13<sup>th</sup> 2011.

**Prasse, C.**, Schulz, R., Ternes, T. Transformation of structurally similar antiviral drugs in biological wastewater treatment (poster). TransCon Conference. Ascona (Switzerland), September 12<sup>th</sup> – 16<sup>th</sup> 2010.

**Prasse, C.**, Schulz, R., Ternes T. Antiviral drugs in the aquatic environment: a new pharmaceutical class of environmental concern? (oral presentation). SETAC Europe 20<sup>th</sup> annual meeting. Seville (Spain), May 23<sup>th</sup> – 27<sup>th</sup> 2010.