Assoc.-Prof. Mag. Dr. Martina Marchetti-Deschmann

Personal Information

Born: 18.01.1971 in Vienna, Austria

Married to: Klaus Deschmann (since 03.06.2008)

Citizen: Austria (EU)

Language: German (native speaker), fluent in spoken and written English

---

Work

Vienna University of Technology (VUT)
Institute of Chemical Technologies and Analytics (CTA)
Getreidemarkt 9/164-IAC, 1060 Vienna, Austria, Europe
Tel.: +43-1-58801-15162; Fax: +43-1-58801-915162; M: +43-664-605887663
Email: martina.marchetti-deschmann@tuwien.ac.at
http://www.cta.tuwien.ac.at/division_instrumental_analytical_chemistry/omics_technologies/

Education and Key Professional Appointments

since 10/2013	Coordinator of PhD program *MEIBio* (Molecular and Elemental Imaging in Biosciences) at VUT (http://mei-bio.tuwien.ac.at)
30.10.2013	Habilitation (*venia docendi*) in the field of "Instrumental Bioanalytical Chemistry": *"From Proteomics to Mass Spectrometric Imaging - Mass Spectrometry and Electrophoresis As Central Bioanalytical Tools to Assess Complex Biological Samples"*
since 03/2013	Head of the "Metabolomics and Bioprocess Analysis Laboratory"
since 02/2013	Associate Professor at VUT, CTA
02/2009 – 01/2013	Assistant Professor at VUT, CTA
10/2012	Research stay at Leiden University Medical Center, Department of Parasitology, Mass spectrometry-based clinical proteomics and imaging Mass Spectrometry, Asst.-Prof. Dr. Liam Mcdonnell
07/2010, 09/2012	Research stay at Foundation for Fundamental Research on Matter (FOM) Institute AMOLF Biomolecular Imaging Mass Spectrometry, Prof. Dr. Ron M.A. Heeren
2009-2012	Junior Faculty Member of Graduate School Program *AB-Tec* (Applied Bioscience Technology) at VUT
08/2006 and 12/2007	Research stay at Academy of Sciences of the Czech Republic, Institute of Analytical Chemistry, Department of Proteomics and Glycomics, RNDr. Josef Chmelík
02/2003 – 01/2009	Universitätsassistentin at VUT

06-07/2002	Research stay at University of Münster, Institute of Medical Physics and Biophysics; Laser Mass Spectrometry Group, Univ.-Prof. Dr. F. Hillenkamp
2000 – 18.11.2002	Ph.D. thesis at the Institute of Analytical Chemistry at the Faculty of Sciences and Mathematics at the University of Vienna: *"Characterization of Allergy Related Proteins and Peptides in Natural Latex Gloves and Flowers of Sambucus nigra"*
1999 – 2000	Master Thesis at the Institute of Analytical Chemistry, University of Vienna, Graduated as Master of Science at the Faculty of Sciences and Mathematics at the University of Vienna
1989 – 1999	Studies of Analytical Chemistry, University of Vienna
1981 – 1989	Wirtschaftskundliches Realgymnasium "Mater Salvatoris" in Vienna (high school with focus on economics), Vienna, Austria

Additional Education and Training

2015	WWTF Course – 3 days Course on "Female Leadership in Science"
2012	„Project Development for FP7"
2010-2011	fForte_Coaching (acceptance rate 20 %), seminars and training on: National and International Fundings, Communication, Conflict Management, Team Building, Self Management, Rhetoric, Project Management, Gender Aspects of Science

Full and Part-time Work, Internships

1990- 2001	St. Anna Children's hospital, hospital admission (20h/week)
1997- 1998	University of Vienna, Univ.-Prof. Dr. E. Schmid, Enviromental Analysis (10h/week)
1994- 1996	Consulting Engineer DI W. Cernoch, Enviromental Analysis (40h/week)
07-09/ 1993, 1994	Biutec, Enviromental Analysis (30h/week)
07-08/ 1991, 1992	Andritz, Research Assistant/Chemical Engineering (40h/week)
07-08/1990	St. Anna Children's hospital, Research Assistant (40h/week)

Research Topics

- Mass Spectrometry
- Electrophoresis
- Gas Phase Electrophoretic Mobility Mass Analysis, Ion Mobility Separation
- Identification of proteins in complex mixtures using separation methods and mass spectrometry
- Protein chemistry
- Proteomics – gel-based and gel-free approaches, label based relative quantification
- Glycomics – protein characterization, glycan identification, sample preparation
- Metabolomics
- Mass Spectrometry Imaging

Awards

2013	Fritz Feigl Prize of the Austrian Society of Analytical Chemistry (for scientific development in the field of Analytical Chemistry for young researchers focussing their career on academia)
2010	eLearning Award, VUT
2007	Rapid Communication in Mass Spectrometry: Beynon Prize (for innovative advance in mass spectrometric instrumentation or methodology that has had the greatest immediate impact in its particular sub-discipline over the previous two calendar years) http://onlinelibrary.wiley.com/doi/10.1002/rcm.3161/full

Scientific Community

Associated Editor	**EuPA Open Proteomics**
Editorial Board	**Journal of Proteomics**, **Journal of integrated OMICS**
Reviewer for	Czech Science Foundation (CZ), Rheumafond (NL), EU for COST Actions
Peer-Reviewer for	Analytical Chimica Acta, Analytical and Bioanalytical Chemistry, Journal of Proteomics, Journal of Mass Spectrometry, Chromatographia, Journal of Chromatography A, Electrophoresis, Journal of Proteomics, Journal of Neurochemistry, Current Medicinal Chemistry, Journal of Planar Chromatography, Proteome Science, Talanta, Analyst, Journal of Pharmaceutical and Biomedical Analysis
since 2015	Member of the Founding Committee of the ***Mass Spectrometry Imaging Society*** (MSIS)
since 2012	Member of the Executive Committee of the ***European Proteomics Association*** (EuPA)
since Feb 2011	Substitute member of Management Committee of COST BM1104: ***Mass Spectrometry Imaging: New Tools for Healthcare Research***
since Feb 2013	chair of Workgroup 1
since 2006	Member of the ***Austrian Proteomics Association*** (AuPA), Vice president 2011-2013, Member of the Founding Committee of AuPA, responsible for administration from 2006-2011,
since 2004	Alumni of VUT
since 2003	Alumni of University of Vienna
since 2002	Member of the American Society for Mass Spectrometry (ASMS)
since 2000	Member of Gesellschaft Österreichischer Chemiker (GÖCh)

Chair and Organizer of conferences with more than 120 participants:

February 23-24, 2016	**27th MassSpecForum Vienna**, Conference Co-Chair with Dr. G. Allmaier
June 30 – July 4,2014	**8th Central and Eastern European Proteomics Conference** (CEEPC) meets 2nd International Metabolomics Austria (InMetA), Conference Co-Chair with Dr. G. Allmaier and Dr. W. Weckwerth
June 2013	**JunganalytikerInnen Forum** of the Austrian Society of Analytical Chemistry, Conference Co-Chair with Dr. A. Limbeck
Sept 2003 to 2010	1st-8th **Austrian Proteome Research Symposium**, Conference Co-Chair with Dr. G. Allmaier in 2010 together InMetA, Co-Chair with Dr. G. Allmaier and Dr. W. Weckwerth
May 2009	**27th Informal Meeting on Mass Spectrometry**, Conference Co-Chair with Dr. G. Allmaier

---

Academic Affairs

since 2016	President of the Faculty Board
2013-2015	Vice president of the Faculty Board
since 2012	Member of the Faculty Board
since 2010	Senate VUT, Substitute Member
since 2010	Member of the Works Council, Substitute Member

Collaborations with

Academia

- Vienna University of Technology (various institutes) (A)
- University of Natural Resources and Applied Life Sciences (A)
- Medical University of Vienna (A)
- Ludwig Boltzmann Institute for Experimental and Clinical Traumatology (A)
- University of Veterinary Medicine Vienna (A)
- Palacky University, Olomouc (CZ)
- Research Centre for Natural Sciences of the Hungarian Academy of Sciences (H)
- The Institute of Immunology (HR)
- University of Rijeka (HR)
- University of Bath (UK)
- FOM-AMOLF (NL)
- Leiden University Medical Center (NL)
- Lund University (S)

Industry

- Baxter Innovations (A)
- Sandoz (A)
- Boehringer Ingelheim (A)
- RomerLabs (A)
- Agilent Technologies (D)
- Glysure (UK)
- EUCODIS (A)

Funding

Academia

2016/01	"Synthesis and Targeted Application of Metallic Nanoparticles" (Croatian Science Foundation, Co-PI, 10 k€)
2016/01	"The application of mass spectrometry-based „omics" technologies to characterize products relevant for biotechnology and agriculture" (collaborating country Cro, OeAD/WTZ, PI, 6.95 k€)
2015/05	"Molecular Enhanced Immunoscoring in Colorectal Cancer" (collaboration partner of CB-Med (K1 center, FFG), PI, 20.0 k€)
2015/01	"Qualitative and quantitative analysis of the performance of pseudotrypsin towards protein substrates as a contribution to proteomics" (collaborating country CZ, OeAD/WTZ, PI, 5.6 k€)
2011-2015	"System biology and ecology of microcolonial fungi and their adaptation to extreme environments" (FWF 2011, Co-PI, 244 k€)
2010-2013	"BIOGEN: From genes to biocontrol" (Co-PI, WWTF, 2009, 410 k€)
2010-2012	"GENIE - GENder - related Implant Examination" (FFG, Co-PI, 78.1 k€)
2012	"1000 Hz Laser Imaging Tandem TOF Mass Spectrometry of Small Molecules in (Bio)Material Sciences - KILIT-MS" (Innovative Projects TU Vienna, Co-PI, 700 k€)
2010/11 & 2011/12	"Mass spectrometry-based proteomic analysis: characterisation of horseradish esterases, snake venom proteins and identification of Fusarium species" (collaborating country Cro, OeAD/WTZ, PI, 11.3 k€)
2011	"Quantitative micro-volume analysis in environmental biological, metallurgical, ceramic and polymeric materials by Laser-Ablation Inductively-Coupled-Plasma Mass Spectrometry (LA-ICP-MS)" (Innovative Projects TU Vienna, Co-PI, 200 k€)
2009	"MMI – Molecular Mass Imaging" (Innovative Projects TU Vienna, Co-PI, 120 k€)
2003	"Identifizierung und Charakterisierung „allergener" ribosom-inaktivierender Proteine aus Holunder mittels 2D-Gelelektrophorese" (Hochschuljubiläums-stiftung, PI, 5000 Schilling)

Projects with industry and other academic institutions not submitted to funding agencies:

since 2013	Glysure, Proteome analysis for Glucose Sensor improvement (PI, 30 k€)
since 2013	EUCODIS, Peroxidases for White Biotechnology (PI, 20 k€)
since 2012	Boehringer Ingelheim, Biopharmaceutical/Biosimilar Characterization (PI, 20 k€ *p.a.*, additional funding for special efforts – until 2015: 53 k€)
since 2012	RomerLabs, Protein Characterization for Lateral Flow Device Development (PI, 24 k€)
since 2012	University of Vienna, BioGlue Analysis (PI, 10 k€)

2003-2009 Assistant in various projects:

"En- and excystment proteins in *Acanthamoeba castellani*" (FWF)
"Jak-Stat Signalling: from basics to disease" (FWF SFB)
"Human Doping Control Proteomics – Mass Spectrometric Microcharacterization" (GenAU Pilotproject)
"Proteome studies of "off target"- effects in nucleic acid" (University of Vienna)

Teaching

Finalized theses:

18 Bachelor theses

Diploma Theses:

Student Years	Sex	Research topic / Title of the thesis	Pub accept	Pub subm.
Venia Docendi since Juni 2013 (allowance to take exam)				
Benedikt Putz 2013 - Nov 2014	M	Characterization of recombinant Peroxidases in respect to efficiency and reaction characteristics for selected substrates	Confid. data	
Christopher Stephan 2012- 2013	M	Mass spectrometry to characterize mycotoxin conjugates (proteins and peptides)		1
Bianca Bruckner 2012-2013	F	Identification of Phosphoproteins related to Mycoparasitism of Trichoderma atroviride	In prep.	
Sandra Stranzinger 2012-2013	F	Development of a quantitative proteomics method to study the adaption of fungi to extreme environments	1	
Max Kosok 2013-2014	M	Identifying proteins from the glue of the salamander Plethodon shermani	In prep.	
Konrad Kainz 2013-2014	M	Impedimetric detection of beta-lactam antibiotic resistance genes	Confid. data	
Anna Koch 2014 - 2015	F	Optimizing Sample Preparation For Proteome Characterization – The Secretome Of Mesenchymal Stem Cells		
Vitoria Dorrer 2013- (2015 research stay in NZ)	F	Protein Identification and Glycoanalysis of BioGlue from *Arachnocampa luminosa*		
Elisabeth Soher 2014 -	F	Method Development for quantifying protein modifications using LC-MS/MS		
Sonja Reitschmidt 2014 -	F	Characterization of Fungal Interactions by Intact Cell Mass Spectrometry and Mass Spectrometry Imaging		
Elitsa Zareva 2014 -	F	Molecular Phenotyping of human cell lines by Intact Cell Mass Spectromtry		
Rudolf Bednar 2015 -	M	Multiple reaction monitoring of iTRAQ labeled (phospho)peptides for robust quantitative proteome analysis		

PhD theses:

Student Years	Sex	Research topic / Title of the thesis	Pub	Pub subm./in prep
without *Venia Docendi*, supervision				
Jasmin Hirschmann (Kemptner) 2004-2008	F	Sample preparation for matrix-assisted laser desorption/ionization mass spectrometry (MALDI MS) and gas phase electrophoretic macromolecular mobility analyzer (GEMMA) related to proteins, polymers and intact Fusarium spores	6	
Tom Grunert 2005-2009	M	The effect of tyrosine kinase 2 (Tyk2)-deficiency on primary murine macrophages monitored by qualitative and quantitative proteomic analysis	4	
Honjuan Dong 2007-2010	F	Intact Cell Mass Spectrometry of Mycotoxin-Producing Fusarium Fungi For Differentiation and Protein Identification	3	
Marlene Havlik 2009-2013	F	An Analytical-Chemical Platform For Vaccine and Virus Particle Characterization	4	1
Ela Herwig 2008-2012	F	Immunoprecipitation combined with micro capillary gel electrophoresis on chip, gas-phase electrophoretic mobility macromolecular analyzer (GEMMA) and matrix assisted laser desorption ionization mass spectrometry (MALDI MS) of proteins and conjugates	5	
Michaela Helmel 2011-2014	F	Innovative Strategies and Techniques for Efficient Bioprocess Development and Control	5	
Nicole Engel 2012-	F	Biopolymer and nanoparticle separation based on electrophoretic mobility in the gas phase and the liquid phase	1	1
Venia Docendi since Juni 2013, supervision and allowance to take exam				
Sophie Froehlich 2010- May 2014	F	Mass Spectrometry Imaging to Visualize Biological Residues on Joint Explants	5	1
Albert Nemes 2010-Dec 2014	M	Identification of Regulators of Mycoparasitism in the Biocontrol Fungus Trichoderma atroviride by Phosphoproteomics and Reverse Genetics	In prep.	
Petra Volejnik (Mikulicova) 2012-2014	F	Mass Spectrometry and hyphenated Techniques for Quantitative Metabolomics in association to Applied Biosynthetic Cell-Factories		

Mathias Holzlechner 2013-	M	Molecular Mass Imaging of biological tissue using MALDI-TOF-MS, SIMS and LA-ICP-MS		1
Anastasiya Svirkova 2014-	F	Mass Spectrometry Imaging and Fluorescence Imaging of Polymer Surfaces after Contact with Biological Fluids		
Benedikt Putz 2015-	M	Mass Spectrometry and hyphenated Techniques for Quantitative Metabolomics in Applied Biotechnology		1

Summary of most important lectures and courses since 2003:

Analytical Chemistry (3.5 ECTS) – responsible for molecular analysis: Basic concepts of instrumental analysis: signals (types and filtering techniques), undesired signals (noise, drift and interferences) and techniques to improve S/N ratio. Chromatographic separation techniques in the condensed and gas phase (general principles, theory, important terms (e.g., selectivity, efficiency, resolution) and instrumentation. Selected techniques: thin layer chromatography, liquid chromatography (HPLC, IC, SEC, affinity chromatography) and gas chromatography. Simple detection methods. Electrophoretic separation techniques (general principles, planar and capillary techniques (gel and capillary electrophoresis (SDS-GE and CZE), isoelectric focusing (IEF), isotoachophoresis (ITP)). Simple detection methods. Chemo- and biosensors (basic concepts and instrumental realisation). Principles and concept of modern spectroscopic methods. Elemental analysis: atomic absorption and emission spectroscopy, X-ray fluorescence spectroscopy; Molecular analysis: UV/Vis absorption spectroscopy, fluorescence spectroscopy, chemi- and bioluminescence

Basic lab course in quantitative analytical chemistry (4 ECTS) – fully involved in all aspects: Quantitative analyses and statistical data evaluation of different samples using wet chemical analysis principles: Gravimetric analysis: quantitative analysis of Nickel and Iron by precipitation analysis; Volumetric analyses: Acid/base titration with end point detection by pH glass electrode; Oxidimetric analysis: quantitative analysis of chromate, complexometric titration: quantitative analysis of Ca and Mg Flame-Emission-Spectroscopy: quantitative analysis of alkaline ions in mineral water UV-VIS Spectroscopy: quantitative protein Analysis

Instrumental and Bioanalytical Laboratory (4 ECTS) – fully responsible for electrophoresis and ELISA, involved in GC-MS, IEX: Knowledge and practical experience with the most important techniques of Instrumental Analysis and Bioanalysis covering AAS, IEX, RFA, IR, Electrophoresis, ELISA, GC-MS

Structure elucidation (2 ECTS) – responsible for mass spectrometry: Practical examples for structure elucidation of unknown molecules based on proton and carbon NMR spectra, IR spectra and electron impact mass spectra, discussion of convergent strategies for structure determination incorporating the following data: chemical shift-/coupling-/integration-information derived from NMR spectra; electron impact mass spectra: molecular weight and fragmentation, isotopic pattern, elemental composition and collisions induced dissociation; UV-Vis absorption characteristics of common chromophores; vibration types and frequencies as well as spectral ranges for various functional groups in IR spectroscopy; if required including data from chemical elemental analysis and utilization of computer-aided methods and data bases in NMR, IR and MS.

Seminar for Bachelor Thesis (3 ECTS) – solely responsible: concepts and training for presenting scientific results, strategies to prepare for a talk, communication and rhetoric, basics how to handle the presentation media, handling questions from the auditorium, how to give feedback, how to accept feedback. After giving a short talk (about 20 min), rhetoric aspects, slide layout and composition of the talk are discussed in the group. Presentations are recorded on video and handed to the student.

Graduate:

Bioanalytics (3 ECTS) – focus on Carbohydrates, Lipids, Post-translational Modifications, radio-labelled biomolecules: Sample preparation of biological material (cell disruption methods, isolation and clean-up of biopolymers, labelling and derivatization methods), protein analysis (amino acid analysis, protein analysis, protein sequencing), nucleic acid analysis, carbohydrate analysis (monosaccharide, oligo- and polysaccharides), lipid analysis, analysis of major posttranslational modifications, analysis of radio-labelled biomolecules (incl. introduction into legal requirements)

Glycomics, Lipidomics, Metabolomics (3 ECTS) – solely responsible: Discussion of applied technologies. Importance of these methods for biotechnological processes and drug development. Discussion of concepts and tools in bioinformatics relevant for these topics.
General and structural basics, glycosylation of proteins, analysis of intact glycoporoteins, release and isolation of glycan pool, analysis of free carbohydrates (derivatization, separation, etc.), determination of individual glycan structures, discussion of special glycans, isolation of lipids from biological material, analysis of lipids (separation, immunoassays, …), structure elucidation, discussion of special lipid classes, classification of metabolomic strategies and flux analysis

Biochemical Engineering (lab course, 3 ECTS): Batch fermentation; fed-batch fermentation; process control (data acquisition and interpretation); sterilization; mass transfer (oxygen transfer); computer simulations (continuous fermentation; PID-control); down-stream processing (cross-flow filtration, high pressure cell disruption); bioproduct formulation (spray drying), bioanalysis

Organic Mass Spectrometry (3 ECTS) – solely responsible: Concepts and methods in mass spectrometry for small molecules (natural products, drugs, pharmaceuticals, synthesis products) with special focus on future developments of mass spectrometry.

Previous Lectures to be mentioned:

Analytics of Natural Products (3 ECTS) – responsible for mass spectrometry: Introduction to modern instrumentation for structure elucidation (NMR, MS) of complex structures – Proteins, Nucleotides, Carbohydrates, Alkaloids

Industrial Proteomics (3 ECTS) – focus on data handling and interpretation: Methods and strategies in proteomics: starting points of proteomic projects and definition of the research goals, sample preparation including methods of reduction of the proteome complexity, separation of the proteome, data processing and imaging as well as quantification of separated proteins, identification of individual proteins including the necessary bioinformatics tools, structural characterization of proteins and their posttranslational and bioprocess-related modifications, functional proteomics, high-throughput technologies