UNIVERSITA' DEGLI STUDI DELL'INSUBRIA

Dipartimento di Scienza e Alta Tecnologia

CURRICULUM VITAE

Prof. Damiano Monticelli

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Personal information

Date of birth: March 18th 1974
Place of birth: Milano
Nationality: Italian

Current position

Associate Professor since October 2017

Academic training

2004 – 2017 **Assistant professor** (Ricercatore Universitario)
University of Insubria (Como, IT)
2013 **Visiting professor**
University of the Balearic Island (Palma, ES)
2007 **Research Fellow**
Leibniz-Institut für Analytische Wissenschaften Dortmund, Germany

2003 **PhD degree in chemistry**
University of Insubria (Como, IT)
2001 – 2002 **Honorary Research Assistant**
University of Liverpool (Liverpool, UK)
1998 **Master degree in chemistry** cum laude
University of Milan (Milan, IT)

Teaching experience

As a faculty member, prof. Monticelli was assigned since 2004 with courses in the BSc Environmental Sciences degree and in the MSc Chemical Sciences degree. Course subjects include basic analytical chemistry, advanced instrumental analytical chemistry and environmental chemistry. Prof. Monticelli organised several field stages for the students of the BSc Environmental Sciences degree.

Academic year	Degree	Course	Credits
2003 – 2004	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2004 – 2005	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory Environmental Chemistry	6
2005 – 2006	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2006 – 2007	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2007 – 2008	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2008 – 2009	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2009 – 2010	MSc Chemical Sciences	Advanced Analytical Chemistry	4
	BSc Environmental Sciences	Analytical Chemistry Laboratory	6
2010 – 2011	MSc Chemical Sciences	Electroanalysis	7
2011 – 2012	MSc Chemical Sciences	Electroanalysis	7
2012 – 2013	BSc Chemical Sciences	Environmental Analytical Chemistry	3
	MSc Chemical Sciences	Electroanalysis	7
2013 – 2014	BSc Chemical Sciences	Environmental Analytical Chemistry	3
2014 – 2015	BSc Chemical Sciences	Environmental Analytical Chemistry	3
	MSc Chemical Sciences	Electroanalysis	7
2015 – 2016	BSc Chemical Sciences	Environmental Analytical Chemistry	3
	MSc Chemical Sciences	Electroanalysis	6
	BSc Environmental Sciences	Analytical Chemistry Laboratory	3
2016 – 2017	BSc Chemical Sciences	Applied Analytical Chemistry module A	3
	MSc Chemical Sciences	Electroanalysis	6
	BSc Environmental Sciences	Analytical Chemistry Laboratory	3

2017 – 2018	BSc Chemical Sciences	Applied Analytical Chemistry module A	3
	BSc Environmental Sciences	Analytical Chemistry Laboratory	3
	MSc Chemical Sciences	Electroanalysis	6
2018 – 2019	BSc Chemical Sciences	Analytical Chemistry: fundamentals	6
	BSc Chemical Sciences	Applied Analytical Chemistry module A	3
	MSc Chemical Sciences	Electroanalysis	6
2019 – 2020	BSc Chemical Sciences	Analytical Chemistry: fundamentals	6
	BSc Chemical Sciences	Applied Analytical Chemistry module A	3
	MSc Chemical Sciences	Electroanalysis	6

Supervised Ph.D. students

Prof. D. Monticelli has supervised three Ph.D. students:

2017 – 2021 F. Sanvito, Iron speciation in seawater: development, optimization and characterization of a new competitive ligand equilibration-cathodic stripping voltammetry (CLE-CSV) method

2012 – 2015 S. Caprara, Optimization and development of new voltammetric methods for the determination of iron in seawater

2007 – 2010 A. Castelletti, Validazione del protocollo analitico di equilibrazione competitiva dei leganti accoppiata a stripping catodico per la speciazione di elementi in traccia [Validation of the analytical protocol for the speciation analysis of trace elements by competitive ligand equilibration coupled to cathodic stripping]

Supervised postdoc students

July 2019 – June 2020 dott. D. Spanu, Fostering analytical capabilities for iron speciation in seawater

July 2020 – June 2021 dott. D. Spanu, Getting iron speciation in seawater out of the box

Research activity

The setup of instrumental methods for the determination and speciation of trace elements in both natural and manmade materials, combining different analytical techniques is the main research topic. The results of the research activity are as follows. Prof. Monticelli authored or coauthored 76 papers (as of March 2021), 67 of which in ISI catalogue journals, and more than seventy communications in national and international conferences. His h-index is 14, with over 600 citations, the sum of the Impact Factors (IF) of his papers is 180.

The setup of new instrumental methods and their optimisation is achieved by critically assessing all of the preanalytical and analytical steps, i.e. choice of the analytical method, sampling, sampling storage, pretreatment, detection, statistical evaluation and method validation. Performance enhancement has been achieved by the development of new hardware, the setup of novel methods and the optimisation of existing ones. Prof. Monticelli gained expertise in the field of electroanalytical techniques (anodic and cathodic stripping), spectroscopic methods (Electrothermal Atomic Absorption Spectroscopy and Total Reflection X-Ray Fluorescence) and mass spectrometric (Inductively Coupled Plasma – Mass Spectrometry). The latter was employed with both liquid introduction and solid sampling by laser ablation (LA-ICP-MS).
The setup of procedures for the speciation analysis of trace elements is the second active field of research. These studies enable the form of trace elements to be determined defining their inorganic and organic reactivity in natural waters. The competitive ligand equilibration with cathodic stripping voltammetric detection of the labile fraction (CLE-CSV) is used for this aim. Methodological investigations and applied research were undertaken. The figures of merit of the method were firstly assessed: all of the steps were carefully assessed, and critical points highlighted. As a result, accuracy and precision of the procedure were, for the first time, measured. An effort was also made to understand the molecular bases for the cathodic stripping voltammetric procedure to further increase performances. The speciation method was subsequently applied to the detection of copper speciation in remote areas, like Alpine lakes, ice streams and open ocean waters. The speciation of copper ion was initially investigated, whereas the focus was moved to iron during the last five years in view of its importance in oceanic biogeochemical cycles.

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Recent projects

2019 – 2022 AMICO project: Innovative Analytical Methods to study biogenic and anthropogenic proxies in Ice Cores, founded by the Italian Ministry of University and Research (PRIN project, call 2017, protocol 2017EZNJWN_001)
Role: researcher, CNR Istituto Scienze Polari unit

2017 – 2020 INSIDE project: INdividual air pollution exposure, extracellular vesicles SIgnaling and hypertensive disorder DEvelopment in pregnancy, founded by the Italian Ministry of University and Research (PRIN project, call 2015, protocol 20152T74ZL)
Role: researcher, University of Insubria unit

2013 – 2015 Chemical Sensors and instrumental techniques hyphenated with mass spectrometry for the control of food safety, founded by the Italian Ministry of University and Research (PRIN project, call 2010-2011, project 2010AXENJ8_006)
Role: leader of the University of Insubria research unit

2012 New technologies (ICT) for a sustainable and integrated management of natural resources in Lebanon (AID 9145), founded by the Italian International Cooperation
Role: teaching

2010 – 2011 Italian cooperation re-training program for former Iraqi defence-related bio-chem specialists, founded by the Italian International Cooperation
Role: teaching and project management

2008 – 2010 Programma Nazionale di Ricerche in Antartide Studio e caratterizzazione di microcostituenti chimici con proprietà complessanti forti nell'ambiente marino dell' Antartide, in relazione al ciclo stagionale di formazione/scioglimento del pack-ice [Italian program of Antarctic Research. Characterisation of strongly complexing species in the Antarctic marine ecosystem: seasonal trends in relation to pack ice thawing]
Role: project management and research activities

Field activities

- 2001 – present several sampling campaigns in the Italian Alps, in particular glacial streams, mine affected areas and lakes
- March 2004: one week cruise in the Mediterranean Sea onboard Oceanographic Ship "G. Dallaporta"
- August 2003: one week cruise in the Mediterranean Sea onboard Oceanographic Ship "G. Dallaporta" (IMTEC project)
- March 11th – April 2nd 2002: three week cruise in the Bay of Biscay onboard Research Vessel "Pelagia" (IRONAGES project)

Most relevant publications in scientific journals

Copper speciation in glacial stream waters of Rutor glacier (Aosta Valley, Italy), D. Monticelli, C. M. G. van den Berg, A. Pozzi, C. Dossi, *Ausralian Journal of Chemistry* 57 (2004), 945-949

Lead and copper speciation in remote mountain lakes, A. Ploger, E. Fisher, H.P. Nirmaier, L.M. Laglera, D. Monticelli, C.M.G. van den Berg, *Limnology & Oceanography* 50 (2005), 995-1010

Differential pulse voltammetric determination of tin in the presence of noble metals, D. Monticelli, R. Psaro, A. Pozzi, C. Dossi, S. Recchia, *Analytical and Bioanalytical Chemistry* 383(1) (2005), 115-121

Fluid-controlled crustal metasomatism within a high-pressure subducted mélange (Mt. Hochwart, Eastern Italian Alps), S. Tumiati, G. Godard, S. Martin, U. Klötzli, D. Monticelli, *Lithos*, 94 (2007), 148-167

Optimization and validation of an automated voltammetric stripping technique for ultratrace metal analysis, D. Monticelli, E. Ciceri, C. Dossi, *Analytica Chimica Acta*, 594 (2007), 192-198

Tree ring microanalysis by LA–ICP–MS for environmental monitoring: validation or refutation? Two case histories, D. Monticelli, A. Di Iorio, E. Ciceri, A. Castelletti, C. Dossi, *Microchimica Acta*, 164 (2009), 139 – 148

Role of laser ablation–inductively coupled plasma–mass spectrometry in cultural heritage research: A review, B. Giussani, D. Monticelli, L. Rampazzi, *Analytica Chimica Acta*, 635 (2009), 6 – 21

Design and performances of a cyclonic flux cell for laser ablation, D. Monticelli, E. L. Gurevich, R. Hergenröder, *Journal of Analytical Atomic Spectrometry*, 24 (2009), 328 – 335

Assessment of accuracy and precision in speciation analysis by competitive ligand equilibration–cathodic stripping voltammetry (CLE–CSV) and application to Antarctic samples, D. Monticelli, C. Dossi, A. Castelletti, *Analytica Chimica Acta*, 675 (2010), 116 – 124

Quantification of iron in seawater at the low picomolar range based on optimization of bromate ammonia dihydroxynaphtalene system by catalytic adsorptive cathodic stripping voltammetry, L. M. Laglera, J. Santos-Encheandia, S. Caprara, D. Monticelli, *Analytical Chemistry*, 85 (2013), 2486 – 2492

Cathodic pseudopolarography: a new tool for the identification and quantification of cysteine, cystine and other low molecular weight thiols in seawater, L. M. Laglera, J. Downes, A. Tovar-Sánchez, D. Monticelli, *Analytica Chimica Acta*, 836 (2014), 24-33

Anodic Stripping Tin Titration: a novel method for the voltammetric determination of platinum at trace levels, B. Giussani, S. Roncoroni, A. Nemenyi, V. Dal Santo, D. Monticelli, S. Recchia, *Analytical Chemistry*, 86 (2014), 6654-6659

Ultrasensitive and fast voltammetric determination of iron in seawater by atmospheric oxygen catalysis in 500 µl samples, S. Caprara, L. M. Laglera, D. Monticelli, *Analytical Chemistry*, 87 (2015), 6357-6363

A compilation of iron speciation data for open oceanic waters, S. Caprara, K. N. Buck, L. Gerringa, M. Rijkenberg, D. Monticelli, *Frontiers in Marine Science*, 3 (2016), 221

Iron detection and speciation in natural waters by electrochemical techniques: A critical review, L. M. Laglera, D. Monticelli, *Current Opinion in Electrochemistry*, 3 (2017), 123-129

Trace elements and POPs in two commercial shark species from Djibouti: Implications for human exposure, G. Boldrocchi, D. Monticelli, Y. Moussa Omar, R. Bettinetti, *Science of The Total Environment*, 669 (2019), 637-648

Strategies for the characterization and optimization of adsorptive stripping voltammetry with catalytic enhancement for ultratrace element determination: The case of iron 2,3-dihydroxynaphthalene complex with catalytic enhancement by atmospheric oxygen, F. Sanvito, A. Maspero, D. Monticelli, *Electrochimica Acta* 321 (2019), 134653

Introducing Frontal Chromatography–Inductively Coupled Plasma-Mass Spectrometry as a Fast Method for Speciation Analysis: The Case of Inorganic Arsenic, D. Spanu, C. Dossi, D. Monticelli, L. Rampazzi, S. Recchia, *Analytical Chemistry* 91 (2019), 13810-13817

First concurrent assessment of elemental- and organic-contaminant loads in skin biopsies of whale sharks from Djibouti , G. Boldrocchi, D. Monticelli, L. Butti, M. Omar, R. Bettinetti, *Science of the Total Environment* 722 (2020), art. no. 137841

Fast iron speciation in seawater by catalytic Competitive Ligand Equilibration-Cathodic Stripping Voltammetry with tenfold sample size reduction, F. Sanvito, D. Monticelli, *Analytica Chimica Acta* 1113 (2020), 9-17

Trace element quantification in light fuels by total reflection X-ray fluorescence spectrometry, A. Cinosi, G. Siviero, D. Monticelli, R. Furian, *Spectrochimica Acta Part B: Atomic Spectroscopy* 164 (2020), 105749

One-minute highly selective Cr(VI) determination at ultra-trace levels: An ICP-MS method based on the on-line trapping of Cr(III), D. Spanu, D. Monticelli, G. Binda, C. Dossi, L. Rampazzi, S. Recchia, *Journal of Hazardous Materials* 412 (2021) art. no. 125280

The what, how, why, and when of dendrochemistry: (paleo)environmental information from the chemical analysis of tree rings, G. Binda, A. Di Iorio, D. Monticelli, *Science of the Total Environment* 758 (2021), art. no. 143672

Participation to conferences

C1 XX Congresso Nazionale della Società Chimica Italiana, Rimini (Italy), June 2000
C2 Convegno Nazionale 'Terzo millennio: il futuro della chimica analitica nel controllo alimentare ed ambientale', Roma (Italy), February 2001
C3 Convegno Nazionale 'Attualità ed interdisciplinarità della chimica analitica', Roma (Italy), February 2002
C4 ISA 2002 Le spettroscopie nel controllo ambientale, Val Masino (Italy), April 2002
C5 XVII Congresso Nazionale di Chimica Analitica, Viareggio (Italy), June 2002
C6 XXI Congresso Nazionale della Società Chimica Italiana, Torino (Italy), June 2003
C7 Speciazione e biodisponibilità dei metalli in ecosistemi acquatici, Parma (Italy), October 2003
C8 ISA2004 – Incontro di Spettroscopia Analitica 'Sviluppi della spettroscopia analitica per lo studio dell'ambiente, dei beni culturali e dei materiali innovativi', Sestri Levante (Italy), April 2004
C9 XVIII Congresso Nazionale di Chimica Analitica, Parma (Italy), September 2004
C10 XIX Congresso Nazionale di Chimica Analitica, Pula (Italy), September 2005
C11 XXII Congresso Nazionale della Società Chimica Italiana, Firenze (Italy), September 2006
C12 European Winter Conference on Plasma Spectrochemistry, Taormina (Italy), February 2007
C13 EUROanalysisXIV Antwerp (Belgium), September 2007
C14 XX Congresso Nazionale di Chimica Analitica, S. Martino al Cimino (Italy), September 2007
C15 4th International Conference on Trace Element Speciation in Biomedical, Nutritional and Environmental Sciences, Munchen (Germany), May 2008
C16 XXI Convegno nazionale della Divisione di Chimica Analitica della Società Chimica Italiana, Arcavacata di Rende (Italy), September 2008
C17 European Winter Conference on Plasma Spectrochemistry, Graz (Austria), February 2009
C18 XII Convegno Nazionale Chimica degli Ambienti Polari, Venezia (Italy), June 2009
C19 12th Workshop on Progress in Analytical Methodologies for Trace Metal Speciation, Mainz (Germany), September 2009
C20 3rd EuCheMS Chemistry Congress, Nürnberg (Germany), August 2010
C21 XXII Convegno nazionale della Divisione di Chimica Analitica della Società Chimica Italiana, Como (Italy), September 2010
C22 European Winter Conference on Plasma Spectrochemistry, Zaragoza (Spagna), February 2011
C23 EUROanalysis 16, Beograd (Serbia), September 2011
C24 25th Conference of Spectrometry, Schaffhausen (Swuiss), September 2011
C25 XXII Congresso Nazionale della Divisione di Chimica Analitica della Società Chimica Italiana, Biodola, Isola d'Elba (Italy), September 2012
C26 COST workshop Voltammetry and geotraces, Šibenik (Croatia), October 2012
C27 The BNASS / TraceSpec Tandem Conference, Aberdeen, Scotland, 31st August - 4th September 2014
C28 Organic Ligands - A Key Control on Trace Metal Biogeochemistry in the Ocean An Open Workshop and Symposium organized by SCOR WG 139, Šibenik, Croatia, 7-11 April 2015
C29 XXV Congresso della Divisione di Chimica Analitica della Società Chimica Italiana, Trieste, 13 – 17 September 2015

C30 XXVI Congresso della Divisione di Chimica Analitica della Società Chimica Italiana, Giardini Naxos (ME), 18 – 22 settembre 2016

C31 17th International Conference on Total Reflection X-ray Fluorescence Analysis and Related Method, Brescia, 19-22 September 2017

C32 17th International Conference on Electroanalysis ESEAC 2018, Rhodes, Greece, 3-7 June 2018

C33 XXVII Congresso della Divisione di Chimica Analitica della Società Chimica Italiana, Bologna, Italy, 16-20 September 2018

C34 18th International Conference on Total Reflection X-ray Fluorescence Analysis and Related Method, Girona, Spain, 25-28 June 2019

C35 XXVIII Congresso Nazionale della Divisione di Chimica Analitica della Società Chimica Italiana, Bari, Italy, 22-26 September 2019

C36 Ocean Science Meeting 2020, San Diego, USA, 16-21 February 2020