

Dr. Davide Esposito

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Research ID: M-6737-2015

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• **SCIENTIFIC DEVELOPMENT**

2012-present Habilitation (professor qualification) at University of Potsdam, Germany

2012-present Group Leader: MPI for Colloids and Interfaces, Potsdam, Germany

2011-2012 Postdoctoral Research: MPI for Colloids and Interfaces, Potsdam, Germany (With Prof. M. Antonietti)

• **EDUCATION**

2006-2011 PhD Studies: Department of Chemistry, ETH Zürich, Switzerland (With Prof. P. H. Seeberger [research supervisor] and Prof. D. Neri [administrative supervisor])

2000-2006 Degree (Bs/Ms) in Organic Chemistry: University of Naples "Federico II", Italy (with Prof. M. Parrilli), with a research stay at Leiden University, The Netherlands

• **FELLOWSHIPS AND AWARDS**

2015 highly commended finalist (top 10) for the G2C2 Young Research Award

2012 Max Planck Postdoc Fellowship

2006 Research Fellowship for pursuing synthetic studies "Towards a Plague Vaccine candidate" at ETH Zürich. Funding agency: Spiez Laboratory, Switzerland

2004 Socrates Erasmus European Fellowship, research stay (6 months) at the Bio-organic synthesis group, Department of Organic Chemistry, Leiden University, The Netherlands

• **SUPERVISION OF UNDERGRADUATE, GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

Postdoc Narasimharao Kanna (Jan 2015-Sep 2015, short stay), Dr. Gianpaolo Chieffi (July 2013-July 2015), Dr. Zuzana Vobecka (Aug 2013-Mar 2014, short stay)

PhD Dr. Sarah Kirchhecker (Aug 2012-Aug 2015), "Renewable Imidazolium Zwitterions as Platform Molecules for the Synthesis of Ionic Liquid and Materials",
Dr. Valerio Molinari (Jan 2013-Nov 2015), "Ni-based materials for the catalytic conversion of lignocellulosic biomass into valuable products",
Max Braun (Feb 2015-present), Micaela Graglia (Jun 2014-present), Elliot Steeples (Oct 2013-present), Binshen Wang (visiting PhD student, Sep 2014-Feb 2015)

Master Marcos Fernandez-Castaño (Master student, Apr 2013-Sep 2013), "Sustainable Building Blocks for Polymers",
Servann Herou (Master student, Jan 2014-May 2014), "Synthesis and Analysis of Carbon Aerogels in Electro-chemistry",

- **PROFESSIONAL SERVICES**

- Referee service for Journals: Angewandte Chemie, European Polymer Journal, Polymer International, ACS Sustainable Chemistry & Engineering, Synlett, Dalton Transaction, ChemSusChem, ACS Catalysis, Green Chemistry, Catalysis Science and Technology, Industrial and Engineering Chemistry Research, Applied Catalysis B Environmental, Nature Communication, Applied Surface Science, Material Chemistry and Physics.
- Referee service for funding: Research Grants Council, Hong Kong, (2014)

- **SELECTED INVITED PRESENTATIONS AT CONFERENCES AND INSTITUTE SEMINARS**

- 2016
- Japan-Germany Workshop on "Molecular Technology" (DFG), Berlin Germany, invited lecture: "Bio-based chemicals: sustainable opportunities at the interface between material science and organic synthesis".
 - Potsdam University, Germany, Department of Chemistry, institute colloquium: "Biorefinery: a sustainable landscape at the interface between materials and organic synthesis".
- 2015
- 3rd International Conference on Ionic Liquid based materials, Berlin, Germany, lecture: "Hydrothermal Methods for the Decarboxylation of Amino Acid Derived Zwitterion Compounds: Towards Sustainable Ionic Liquids"
 - EPFL Lausanne, Switzerland, Department of Chemical Engineering, invited lecture: "Biorefinery: a sustainable Landscape for the Synthesis of Materials and small Molecules"
 - 3rd International Symposium on Green Chemistry, La Rochelle, France, lecture: "Towards integrated biorefineries for the conversion of biomass into value-added chemicals"
 - Hybrid Materials 2015, Sitges, Spain, lecture: "Hybrid materials as catalysts for biorefinery"
- 2014
- MPIKG-Weizmann Institute Symposium, Max Planck Institute for Colloids and Interfaces, invited lecture: "Chemical feedstocks from biomass: Towards integrated conversion schemes"
 - 7th Green Solvents Conference, Dresden, Germany, lecture: "Hydrothermal Methods for the Decarboxylation of Amino Acid Derived Imidazolium compounds: Towards Sustainable Ionic Liquids"
 - MPI LeadNet Meeting, Mainz, Germany, invited lecture: "Chemicals from renewable feedstock: towards integrated biorefineries"
 - ACS Dallas Chemistry & Materials for Energy, Dallas, USA, lecture: "Chemical Feedstocks from Biomass: an integrated Conversion Scheme"
- 2013
- 1st EuCheMS Green and Sustainable Chemistry, Budapest, Hungary, lecture: "Biomass Derived Chemical Feedstocks and Building Blocks"
 - Max Planck Institute for Coal Research (MPIKOFO), Mülheim, Germany, invited lecture: "Biomass Derived Chemical Feedstocks and Building Blocks"
 - University of Naples "Federico II", Italy, invited lecture: "Biomass Derived Chemical Feedstocks"

- **FULL PUBLICATION LIST**

*: *contributing as the corresponding author.*

1) Steeples, E.; Kelling, A.; Schilde, U.; *Esposito, D. *New J. Chem.* **2016**, DOI: 10.1039/C5NJ03337C, "Amino acid-derived *N*-heterocyclic carbene palladium complexes for aqueous phase Suzuki-Miyaura couplings"

- 2) Graglia, M.; Pampel, J.; Hantke, T.; *Fellinger, T.-P.; *Esposito, D. *ACS Nano* **2016**, DOI: 10.1021/acsnano.5b08040, “Nitro Lignin derived Nitrogen Doped Carbon as Efficient and Sustainable Electrocatalyst for the Oxygen Reduction”
- 3) Molinari, V.; Clavel, G.; Graglia, M.; Antonietti, M.; *Esposito, D. *ACS Catal.*, **2016**, DOI: 10.1021/acscatal.5b01926, “Mild Continuous Hydrogenolysis of Kraft Lignin over Titanium Nitride-Nickel Catalyst”.
- 4) Chieffi, G.; Braun, M.; *Esposito, D. *ChemSusChem*, **2015**, *8*, 3590-3594, “Continuous reductive amination of biomass derived molecules over carbonized filter paper supported FeNi alloy”.
- 5) Chieffi, G.; Fechler, N.; *Esposito, D. *RCS Advances*, **2015**, *5*, 63691-63696, “Valorization of lignin waste from hydrothermal treatment of biomass: towards porous carbonaceous composites for continuous hydrogenation”.
- 6) *Esposito, D.; Antonietti, M. *Chem. Soc. Rev.*, **2015**, *44*, 5821-5835, “Redefining biorefinery: the search for unconventional building blocks for materials”.
- 7) Graglia, M.; Kanna, N.; *Esposito, D. *ChemBioEng Rev.*, **2015**, *2*, 377–392, “Lignin Refinery: Towards the Preparation of Renewable Aromatic Building Blocks”.
- 8) Kirchhecker, S.; Bake, S.; Antonietti, M.; Taubert, A.; *Esposito, D. *Green Chem.*, **2015**, *17*, 4151-4156, “Renewable Pyridinium ionic Liquids from the continuous hydrothermal Decarboxylation of Furfural-Amino Acid derived Pyridinium Zwitterions”.
- 9) Yang, S.-J.; Rothe, R.; Kirchhecker, S.; Esposito, D.; Antonietti, M.; Fechler, N. *Carbon*, **2015**, *94*, 641–645, “A sustainable synthesis alternative for IL-derived N-doped carbons: Bio-based-imidazolium compounds”.
- 10) Vobecka, Z.; Wei, C.; *Tauer, K.; *Esposito, D. *Polymer*, **2015**, *74 (15)*, 262–271, “Poly(α -methylene- γ -valerolactone):1. Sustainable monomer synthesis and radical polymerization studies”.
- 11) Kirchhecker, S.; *Esposito, D., in *Green Technologies for the Environment*, American Chemical Society, **2014**, *1186*, 53-68, “Amino Acid-Derived Imidazolium Zwitterions: Building Blocks for Renewable Ionic Liquids and Materials”.
- 12) Chieffi, G.; Giordano, C.; Antonietti, M.; *Esposito, D. *J. Mat. Chem. A*, **2014**, *2*, 11591-11596, “FeNi nanoparticles with carbon armor as sustainable hydrogenation catalysts: towards biorefineries”.
- 13) Molinari, V.; Antonietti, M.; *Esposito, D. *Catal. Sci. Technol.*, **2014**, *4*, 3626-3630, “An integrated strategy for the conversion of cellulosic biomass into gamma-valerolactone”.
- 14) Molinari, V.; Giordano, C.; Antonietti, M.; *Esposito, D. *J. Am. Chem. Soc.*, **2014**, *136 (5)*, 1758-1761, “Titanium Nitride-Nickel Nanocomposite as Heterogeneous Catalyst for the Hydrogenolysis of Aryl Ethers”.
- 15) Kirchhecker, S.; Antonietti, M.; *Esposito, D. *Green Chem.*, **2014**, *16*, 3705-3709, “Hydrothermal Decarboxylation of Amino Acid derived Imidazolium Zwitterions: A Sustainable Approach towards Ionic Liquids”.
- 16) Krannig, K.-S.; Esposito, D.; Antonietti, M. *Macromolecules*, **2014**, *47 (7)*, 2350-2353, “Highly Efficient Transfer of Amino Groups to Imidazolium Entities for Polymer Coupling and Cross-Linking”.
- 17) Shalom, M.; Molinari, V.; Esposito, D.; Clavel, G.; Ressnig, D.; Giordano, C.; Antonietti, M. *Adv. Mater.*, **2014**, *26*, 1272-1276, “Sponge-like Nickel and Nickel Nitride Structures for Catalytic Applications”.
- 18) *Esposito, D.; Kirchhecker, S.; Antonietti, M. *Chem. Eur. J.*, **2013**, *19*, 15097–15100, “A Sustainable Route towards Imidazolium Building Blocks based on Biomass Molecules”.
- 19) *Esposito, D.; Antonietti, M. *ChemSusChem*, **2013**, *6*, 989-992, “Chemical Conversion of Sugars to Lactic Acid by Alkaline Hydrothermal Processes”.
- 20) Esposito, D.; Hurevich, M.; Castagner, B.; Wang, C. C.; Seeberger P. H. *Beilstein J. Org. Chem.*, **2012**, *8*, 1601-1609, “Automated Synthesis of Sialylated Oligosaccharides”. (with PhD supervisor)
- 21) Kröck, L.; Esposito, D.; Wang, C. C.; Bindschädler, P.; Castagner, B.; Seeberger, P. H. *Chem. Sci.*, **2012**, *3*, 1617-1622, “Streamlined Access to Conjugation-Ready Glycans by Automated Synthesis.” (with PhD supervisor)
- 22) Castagner, B.; Esposito, D.; Seeberger, H. P. **2011**, “Automated Solid Phase Oligosaccharide Synthesis” in *Glycosylation in diverse cell systems – challenges and new frontiers in experimental glycobiology*, S. Brooks, P. Rudd, B. J. Appelmelk, Eds., The Society for Experimental Biology, London, UK. (with PhD supervisor)
- 23) Oahara, T.; Adibekian, A.; Esposito, D.; Stallforth, P.; Seeberger, P. H. *Chem. Comm.*, **2010**, *46*, 4106-4108, “Towards the Synthesis of a Yersinia pestis Cell Wall Polysaccharide: Enantioselective Synthesis of an L-glycero-D-manno-heptose Building Block”. (with PhD supervisor)
- 24) Hanashima, S.; Castagner, B.; Esposito, D.; Nokami, T.; Seeberger, H. P. *Org. Lett.*, **2007**, *9*, 1777-1779, “Synthesis of an α (2-3) Sialyl Galactose Building Block and its Use in a Linear Synthesis of Sialyl Lewis X”. (with PhD supervisor)

- 25) Bedini, E.; **Esposito, D.**; Parrilli, M. *Synlett*, **2006**, *6*, 825-830, "A Versatile Strategy for the Synthesis of *N*-Acetyl-bacillosamine-Containing Disaccharides Building Blocks Related to Bacterial *O*-Antigens".
- 26) Bonger, K. M.; Wennekes, T.; de Lavoie, S. V. P.; **Esposito, D.**; van den Berg, R. J. B.H. N.; Litjens, R. E. J. N.; van der Marel, G. A.; Overkleeft, H. S. *QSAR Comb. Sci.*, **2006**, *25*, 491-503, "Transformation of Carbohydrate Derived 4-azidopentanal into highly functionalized Pyrrolidines via a Tandem Staudinger/aza-Wittig/Ugi Multicomponent Reaction".