Dr. Maria Chiara di Gregorio
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MARIA CHIARA di GREGORIO

CURRENT EMPLOYMENT

July 2019: Research Associate at the Department of Molecular Chemistry and Materials Science, Weizmann Institute of Science (Rehovot, Israel) in the group of Prof. Milko Erik van der Boom.

PREVIOUS EMPLOYMENT

May 2015 – May 2019: Postdoctoral fellow at the Department of Organic Chemistry, Weizmann Institute of Science (Rehovot, Israel). Supervisor: Prof. Milko Erik van der Boom.

January 2015 – April 2015: Visiting scientist at the laboratory of Prof. Luciano Galantini, "Sapienza" University (Rome, Italy)

EDUCATION

November 2011 – December 2014: Ph.D. in Chemical Sciences at the Doctoral School "V. Volterra", "Sapienza" University (Rome, Italy).
Dissertation title: Self-assembly characterization and applications of bile salt derivatives
Supervisor: Prof. Luciano Galantini

November 2012; February - April 2013; November 2013 - May 2014: Visiting PhD student at the laboratory of Prof. Gil Markovich, School of Chemistry, Tel Aviv University, Tel Aviv, Israel. Research project: Study of chiroptical effects induced by interaction of chiral molecules and plasmonic nanostructures.

December 2012 - January 2013: Visiting PhD student at the laboratory of Prof. Oren Regev, Chemical Engineering Department, Ben-Gurion University of the Negev, Be'er Sheva, Israel. Research project: Characterization of bile salt derivative based catanionic mixtures.

October 2009 - July 2011: M.Sc. in Chemistry at Department of Chemistry, "Sapienza" University (Rome, Italy). Final grade: 110/110 *cum laude*
Dissertation title: Self-assembly properties of bile salt derivatives
Supervisor: Prof. Luciano Galantini

October 2006 - September 2009: Bachelor in Chemistry at Department of Chemistry, "Sapienza" University (Rome, Italy). Final grade: 110/110 *cum laude*
September 2001 - July 2006: High school specializing in Classical Studies "Gabriele D'Annunzio" (Pescara, Italy). Final grade: 100/100

RESEARCH FIELDS

Crystal engineering, metal-organic frameworks, solid-state inorganic chemistry, soft matter, plasmonic systems: design, synthesis, characterization and applications
Spectroscopy techniques: small angle X-ray scattering, light scattering, circular dichroism, powder X-ray diffraction, UV-vis absorption, fluorescence.
Microscopy techniques: transmission electron microscopy and scanning electron microscopy

PRIZES

1. Feinberg Graduate School prize for outstanding achievement in postdoctoral research 2018
Prize awarded by the Weizmann Institute of Science

2. ACS Langmuir prize for best oral presentation of young scientist
32th Conference of the European Colloid and Interface Society, September 2018, Ljubljana (Slovenia).

3. ACS Langmuir prize for best oral presentation of young scientist
30th Conference of the European Colloid and Interface Society, September 2016, Rome (Italy).

4. Award for best oral presentation
Israel Vacuum Society -Material Research Society Student Conference 2018, Weizmann Institute of Science, May 2018, Rehovot (Israel).

5. Boehringer Ingelheim Stiftung award
Selected to contribute a lecture at the 14th International Symposium on Macrocyclic and Supramolecular Chemistry, June 2019, Lecce (Italy).

6. Best Sci-Art Award
Israel Vacuum Society -Material Research Society Student Conference 2016, Weizmann Institute of Science, June 2016, Rehovot (Israel).

7. Selected by the European Colloids and Interface Society to contribute a lecture at the 26th Conference of the European Colloid and Interface Society, September 2012, Malmo (Sweden).

FELLOWSHIPS

2019 - Program for Young Researchers “Rita Levi Montalcini”
Awarded from the Italian Ministry of University and Research
2017 – 2019 Postdoctoral fellowship
Awarded from Weizmann Institute of Science, Department of Organic Chemistry

2015 – 2017 Dean Fellowship
Awarded from Weizmann Institute of Science for postdoctoral position at the Department of Organic Chemistry
2011 – 2014 Doctoral fellowship
Department of Chemistry, "Sapienza" University of Rome

LANGUAGE SKILLS
Native Italian. Fluent in English. Hebrew, Ulpan level - kita bet

PUBLICATIONS
§ equal contribution, * corresponding author

1. Directing both the Morphology and Packing of Chiral Metal-Organic Frameworks by Cation Exchange Mediated by Nanochannels

H. Nasi, M. C. di Gregorio, W. Qiang, L. J. W. Shimon, I. Kaplan-Ashiri, T. Bendikov, M. Lahav, M. E. van der Boom, *submitted*
Preprint available on ChemRxiv DOI 10.33774/chemrxiv-2021-brq1h

2. Chiral Motifs in Interpenetrated Metal-Organic Frameworks Formed from Achiral Tetrahedral Ligands
W. Qiang, M. C. di Gregorio, L. J. W. Shimon, E. V. Alexandrov, D. M. Proseprio, M. Lahav, M. E. van der Boom, *submitted*
Preprint available on ChemRxiv DOI 10.33774/chemrxiv-2021-bf301

3. Revealing the Complex Self-Assembly Behaviour of Sodium Deoxycholate in Aqueous Solution.
A. Jover Ramos, F. Fraga López, F. Meijide del Río, J. Vázquez Tato, J. Cautela, A. del Giudice, M. C. di Gregorio, *J. Colloid Interface Sci*., **2021**, 604, 415-428

4. Physiology and Physical Chemistry of Bile Acids
M. C. di Gregorio,* J. Cautela, L. Galantini,* *Int J Mol Sci*, **2021**, 22, 1780

5. Molecular Cannibalism: Sacrificial Materials as Precursors for Hollow and Multidomain Single Crystals
M. C. di Gregorio, M. Elsousou, Q. Wen, L. J. W. Shimon, V. Brumfeld, L. Houben, M. Lahav, M. E. van der Boom, accepted in *Nat Commun*. **2021**, 12, 957
Highlighted in *Nature Communications* as *Editor's choice*, *Nature Chemistry* social media.

6. Emergence of Chirality and Structural Complexity in Single Crystals at the Molecular and Morphological Levels
M. C. di Gregorio, L. J. W. Shimon, V. Brumfeld, L. Houben, M. Lahav, M. E. van der Boom, *Nat Commun*, **2020**, 11, 380
Highlighted in *Nature Communications* as *Editor's choice*, *ChemistryWorld Magazine* (Royal Chemistry Society), *ChemViews Magazine* (ChemPubSoc Europe), *[C_2W] Magazine* (Royal Netherlands Chemical Society), *Nature Chemistry* social media, *AlphaGalileo, Nanowerk:Nanotechnology News, Phys.org*

7. C-12 vs C-3 Substituted Bile Salts: An Example of the Effects of Substituent Position and Orientation on the Self-Assembly of Steroid Surfactant Isomers
J. Cautela,[§] E. Severoni,[§] C. Redondo-Gómez,[§] M. C. di Gregorio, A. Del Giudice, S. Sennato, R. Angelini, K. Schillén, L. Galantini, *Colloids Surf. B*, **2020**, 185, 110556.

8. Deoxycholic Acid and L-Phenylalanine Enrich their Hydrogel Properties when Combined in a Zwitterionic Derivative
L. Travaglini,[§] M. C. di Gregorio,[§*] E. Severoni, A. D'Annibale, S. Sennato, F. Tardani, M. Giustini, M. Gubitosi, A. Del Giudice, L. Galantini,* *J. Colloid Interface Sci*., **2019**, 554, 453-462

9. Bile Salts: Natural Surfactants and Precursors of a Broad Family of Complex Amphiphiles
M. C. di Gregorio,[§] L. Travaglini, [§] J. Cautela, A. Del Giudice, N. V. Pavel, L. Galantini, *Langmuir*, **2019**, 35, 21, 6803-6821.
Highlighted as front cover

10. Metal-Coordination-Induced Fusion Creates Hollow Crystalline Molecular Superstructures
M. C. di Gregorio, P. Ranjan, L. Houben, L. J. W. Shimon, K. Rechav, M. Lahav, M. E. van der Boom, *J. Am. Chem. Soc.*, **2018**, *140*, 9132–9139.
Highlighted as supplementary cover

11. Bile Acid Derivative-Based Catanionic Mixtures: Versatile Tools for Superficial Charge Modulation of Supramolecular Lamellae and Nanotubes
M. C. di Gregorio, [§] E. Severoni, [§] L. Travaglini, M. Gubitosi, S. Sennato, F. Mura, C. Redondo-Gómez, A. Jover, N. V. Pavel, L. Galantini ([§] equal contribution), *Phys. Chem. Chem. Phys.*, **2018**, *20*, 18957-18968.
Highlighted as hot paper

12. Twisted Nanoribbons from a RGD-Bearing Cholic Acid Derivative
L. Travaglini, C. Giordano, A. D'Annibale, M. Gubitosi, M. C. di Gregorio, K. Schillén, A. Stefanucci, A. Mollica, N. V. Pavel, L. Galantini, *Colloids Surf. B*, **2017**, *159*, 183-190

13. Supramolecular Assembly of Thermoresponsive Steroidal Surfactant with Oppositely Charged Thermoresponsive Block Copolymer
M. C. di Gregorio, M. Gubitosi, L. Travaglini, N. V. Pavel, A. Jover, F. Meijide, J. Vázquez Tato, S. Sennato, K. Schillen, F. Tranchini, S. De Santis, G. Masci, L. Galantini, *Phys. Chem. Chem. Phys.*, **2017**, *19*, 1504-1515.

14. Crystal Structure of a Lithium Salt of a Glucosyl Derivative of Lithocholic Acid
M. Gubitosi, F. Meijide, J. Vázquez Tato, A. Jover, L. Travaglini, A. D'Annibale, M. C. di Gregorio, N. V. Pavel, L. Galantini, *Steroids*, **2016**, *113*, 87-94.

15. Bile Salts and Derivatives: Rigid Unconventional Amphiphiles as Dispersants, Carriers and Superstructure Building Blocks

L. Galantini, M. C. di Gregorio, M. Gubitosi, L. Travaglini, J. Vázquez Tato, A. Jover, F. Meijide, V. H. Soto Tellini, N. V. Pavel, *Curr. Opin. Colloid Interface Sci.*, **2015**, *20*,170-182.

16. Chiroptical Study of Plasmon-Molecule Interaction: The Case of Interaction of Glutathione with Silver Nanocubes

M. C. di Gregorio, A. Ben Moshe, E. Tirosh, L. Galantini, G. Markovich, *J. Phys. Chem. C*, **2015**, *119*, 17111-17116.

17. Tailoring Supramolecular Nanotubes by Bile Salt Based Surfactant Mixtures

M. Gubitosi, L. Travaglini, M. C. di Gregorio, N. V. Pavel, J. Vazquez Tato, S. Sennato, U. Olsson, K. Schillén, L. Galantini, *Angew. Chem. Int. Ed.*, **2015**, *54*, 7018-7021.

18. Multi Stimuli Response of a Single Surfactant Presenting a Rich Self-Assembly Behavior

M. C. di Gregorio, M. Varenik, M. Gubitosi, L. Travaglini, N. V. Pavel, A. Jover, F. Meijide, O. Regev, L. Galantini , *RSC Adv.*, **2015**, *5*, 37800-37806.

19. A Tryptophan-Substituted Cholic Acid: Expanding the Family of Labelled Biomolecules

L. Travaglini, M. Gubitosi, M. C. di Gregorio, A. D'Annibale, F. Meijide, M. Giustini, S. Sennato, M. Obiols-Rabasa, K. Schillén, N. Viorel Pavel, L. Galantini, *Colloids Surf. A*, **2015**, *483*, 142–149.

20. On the Self-Assembly of a Tryptophan Labeled Deoxycholic Acid

L. Travaglini, M. Gubitosi, M. C. di Gregorio, N. V. Pavel, A. D'Annibale, M. Giustini, V. H. Soto Tellini, J. Vázquez Tato, M. Obiols-Ravasa, S. Bayati, L. Galantini, *Phys. Chem. Chem. Phys.*, **2014**, *16*, 19492-504.

21. Self-Aggregation Mechanism of a Naphtylamide Cationic Derivative of Cholic Acid. From Fibrils to Tubules

J. V. Trillo, F. Meijide, A. Jover, V. Soto, S. de Frutos, M. C. di Gregorio, L. Galantini, J. Vázquez Tato, *RSC Adv.*, **2014**, *4*, 5598-5606.

22. Catanionic Gels Based on Cholic Acid Derivatives

M. C. di Gregorio, N. V. Pavel, J. Miragaya, A. Jover, F. Meijide, J. Vázquez Tato, V. H. Soto Tellini, L. Galantini, *Langmuir*, **2013**, *29*, 12342-12351.

23. Between Peptides and Bile Acids: Self-Assembly of Phenylalanine Substituted Cholic Acids

L. Travaglini, A. D'Annibale, M. C. di Gregorio, K. Schillén, U. Olsson, S. Sennato, N.V. Pavel, L. Galantini, *J. Phys. Chem. B*, **2013**, *117*, 9248–9257.

24. pH Sensitive Tubules of a Bile Acid Derivative: A Tubule Opening by Release of Wall Leaves
M. C. di Gregorio, N. V. Pavel, A. Jover, F. Meijide, J. Vazquez Tato, V. H. Soto Tellini, A. Alfaro Vargas, O. Regev, Y. Kasavi, K. Schillén, L. Galantini, *Phys. Chem. Chem. Phys.*, **2013**, *15*, 7560-7566.

25. Drug-Loaded Nanoparticles and Supramolecular Nanotubes Formed from a Volatile Microemulsion with Bile Salt Derivatives
K. Margulis-Goshen, M. C. di Gregorio, N. V. Pavel, L. Abezgauz, D. Danino, J. Vázquez Tato, V. H. Soto Tellini, S. Magdassi, L. Galantini, *Phys. Chem. Chem. Phys.*, **2013**, *15*, 6016-6024.

DATA BASE LINKS FOR BIBLIOMETRIC INDEXES
ResearcherID: G-2536-2019
Google Scholar: For details, click link: publication details
Scopus: For details, click link: publication details
Scopus indexes: h-index: 13 Citations (from 2013): 406 Documents: 23

PATENTS
1. *Metal-organic materials and method for preparation*
Patent number: 9707540
Date of Patent: July 18, 2017
Assignee: YEDA RESEARCH AND DEVELOPMENT CO. LTD.
Inventors: Milko E. Van Der Boom, Michal Lahav, Shira Hamami, Maria Chiara Di Gregorio, Qiang Wen, Sreejith Shankar Pooppanal

2. *Metal-Organic Materials and Method for Preparation*
Publication Number: 20160271582
September 22, 2016
Applicant: YEDA RESEARCH AND DEVELOPMENT CO. LTD.
Inventors: Milko E. van der Boom, Michal Lahav, Shira Hamami, Maria Chiara di Gregorio, Qiang Wen, Sreejith Shankar Pooppanal

CONFERENCES:

Oral contributions
1. Size and Morphology Modulation of Free-Additive Metal-Organic Frameworks
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, The 84th Annual Meeting of the Israel Chemical Society, February 2019, Tel Aviv (Israel)

2. Control over Morphology and Complexity of Metal Organic Frameworks
M. C. di Gregorio, M. Elsousou, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, **selected keynote**, 32th Conference of the European Colloid and Interface Society, September 2018, Ljubljana (Slovenia).

3. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, IVS-MRS Student Conference, Weizmann Institute of Science, May 2018, Rehovot (Israel).

4. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, Applied Nanotechnology and Nanoscience International Conference, October 2017, Rome (Italy).

5. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, L. J. W. Shimon, L. Houben, M. Lahav, M. E. van der Boom, flash presentation, European-Winter School on Physical Organic Chemistry, January 2017, Bressanone (Italy).

6. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, L. J. W. Shimon, L. Houben, M. Lahav, M. E. van der Boom, 30th Conference of the European Colloid and Interface Society, September 2016, Rome (Italy).

7. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, Retreat of the Organic Chemistry Department of Weizmann Institute, April 2016, Kfar Blum (Israel).

8. Catanionic Gels Based on Cholic Acid Derivatives
M. C. di Gregorio, N. V. Pavel, F. Meijide, A. Jover , J. Vázquez Tato , J. Miragaya , and V. H. Soto Tellini, Luciano Galantini, 28th Conference of the European Colloid and Interface Society, September 2014, Limassol (Cyprus).

9. pH Sensitive Tubules of Bile Acid Derivative: A New Mechanism of Tubule Opening
M. C. di Gregorio, N. V. Pavel, A. Jover, F. Meijide, J. Vázquez Tato, V. H. Soto Tellini, A. Alfaro Vargas, O. Regev, Y. Kasavi, K. Schillén, L. Galantini, 26th Conference of the European Colloid and Interface Society, September 2012, Malmo (Sweden).

Poster contributions

1. From Achiral to Chiral: Shaping of Uniform Crystals
di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, and M. E. van der Boom, Symposium commemorating G. M. J. Schmidt's 100th birthday anniversary: Contemporary Crystal Engineering and Solid-State Chemistry, October 2019, Rehovot (Israel)

2. From Achiral to Chiral: Shaping of Uniform Crystals
di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, and M. E. van der Boom, 14th International Symposium on Macrocyclic and Supramolecular Chemistry, June 2019, Lecce

3. Highly Versitile Metal-Organic Frameworks
di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, and M. E. van der Boom, The 4th ERC Grantees Conference, From supramolecular towards systems chemistry, November 2018, Rehovot (Israel)

4. Highly Versitile Metal-Organic Frameworks
M. C. di Gregorio, L. J.W. Shimon, L. Houben, V. Brumfeld, M. Lahav, and M. E. van der Boom, IVS 2017 35th Annual Conference & Workshop, September 2017, Rehovot (Israel)

5. Highly Versitile Metal-Organic Frameworks
M. C. di Gregorio, P. Ranjan, L. J. W. Shimon, L. Houben, K. Rechav, M. Lahav, M. Erik van der Boom, IVS-MRS Student Conference, June 2016, Rehovot (Israel).

6. Metal-Organic Frameworks as Tools for Complex Crystal Design: Controlled Synthesis and Mechanistic Insights
M. C. di Gregorio, P. Ranjan, L. Houben, K. Rechav, M. Lahav, M. E. van der Boom, retreat of the Organic Chemistry Department of Weizmann Institute, April 2016, Kfar Blum (Israel)

7. Metal-Organic Frameworks as Tools for Complex Crystal Design: Controlled Synthesis and Mechanistic Insights
M. C. di Gregorio, P. Ranjan, L. Houben, K. Rechav, M. Lahav, M. E. van der Boom, Weizmann-Alberta Nanoscience Meeting, March 2016, Rehovot (Israel).

8. Catanionic Gels Based on Cholic Acid Derivatives
M. C. di Gregorio, N. V. Pavel, F. Meijide, A. Jover, J. Vázquez Tato, J. Miragaya, and V. H. Soto Tellini, L. Galantini, International Soft Matter Conference, September 2013, Rome (Italy).

9. pH Sensitive Tubules of Bile Acid Derivative: A New Mechanism of Tubule Opening
M. C. di Gregorio, N. V. Pavel, A. Jover, F. Meijide, J.Vázquez Tato, V. H. Soto Tellini, A. Alfaro Vargas, O. Regev, Y. Kasavi, K. Schillén, L. Galantini, 5th Young Researcher Conference, June 2012, Rome (Italy).

INVITED TALKS AND SEMINARS

1. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, German-Israeli Foundation for Scientific Research and Development Young Scientists' Meeting "Synthesis and Catalysis: the Key for a Better Environment, Medicine and Materials", Ma'ale Hahamisha (Israel), 2021.

2. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, Tel Aviv University, School of Chemistry, Physical Chemistry Seminar, February 2020, Tel Aviv (Israel).

3. Colloidal "Chemical Toolkits"
M. C. di Gregorio, Selected Topics in Science and Technology Symposium, Technische Universität München (TUM) and TUM Institute for Advanced Study (TUM-IAS), January 2020, Munich (Germany).

4. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, Ben-Gurion University of the Negev, Department of Chemistry, January 2020, Be'er Sheva (Israel).

5. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, Technion - Israel Institute of Technology, Department of Chemistry, January 2020, Haifa (Israel).

6. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, L. J. W. Shimon, L. Houben, V. Brumfeld, M. Lahav, M. E. van der Boom, 8th Young Researcher Conference, Sapienza University, June 2019, Rome (Italy).

7. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, University of Groningen, Stratingh Institute for Chemistry, June 2019, Groningen (Netherland).

8. Size, Morphology and Assembly Modulation of Metal-Organic Crystals
M. C. di Gregorio, Tel Aviv University, School of Chemistry, Organic Chemistry Seminar, May 2019, Tel Aviv (Israel).

9. Metal-Organic Crystals: Shaping, Uniformity and Symmetry Breaking
M. C. di Gregorio, University of Montpellier, Laboratoires Charles Coulomb, April 2019, Montpellier (France).

10. Size, Morphology and Assembly Modulation of Metal-Organic Crystals
M. C. di Gregorio, Ariel University, Department of Chemistry, January 2019, Ariel (Israel).

11. Size, Morphology and Assembly Modulation of Metal-Organic Crystals
M. C. di Gregorio, Technion - Israel Institute of Technology, Department of Chemistry, December 2018, Haifa (Israel).

12. Size, Morphology and Assembly Modulation of Metal-Organic Crystals
M. C. di Gregorio, Ben-Gurion University of the Negev, Department of Chemistry, November 2018, Be'er Sheva (Israel).

13. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, Electron Microscopy Unit of Weizmann Institute of Science, January 2018, Rehovot (Israel).

14. Highly Versatile Metal-Organic Frameworks
M. C. di Gregorio, meeting with the delegation of the Italy/ Israel GreenMed Summit (event organized by the Italian Ministry of Foreign Affairs and International Cooperation) September 2017, Rehovot (Israel).

15. Stimuli Responsive and Catanionic Bile Salt-Based Systems
M. C. di Gregorio, Encuentro de Envesigation de Quimica Supramolecular Italia-Costa Rica, October 2013, Universidad de Costa Rica, San José (Costa Rica).

INVITED SCIENTIFIC VISITS

October 2017 and January 2022: Department of Chemistry & Molecular Design Institute, New York University, USA

SCHOOLS
European-Winter School on Physical Organic Chemistry, January 2017, Brixen (Italy)