

CURRICULUM VITAE – LORENZO DEGLI ESPOSTI, PH. D.

PERSONAL INFORMATION

Birth date:

Birthplace:

Citizenship:

Address:

E-mail address:

Phone number:

Researcher unique identifier codes:

ORCID: 0000-0002-6596-560X

ResearcherID: AFE-1890-2022

PROFESSIONAL EXPERIENCES

09/2023 – current date:

Fixed-Term Researcher (III Level) at the Institute of Science, Technology and Sustainability for Ceramics (ISSMC CNR, former ISTE CNR) within the NextGenerationEU – Italian PNRR research project CN00000041 “National Center for Gene Therapy and Drugs based on RNA Technology”, Decreto Direttoriale MUR n. 0001035 del 17/06/2022 (BANDO N. 400.1 ISSMC, già ISTE CNR, PNRR MUR M4C2).

Tasks: synthesis and characterization of bioactive calcium phosphate nanoparticles, and their functionalization with therapeutic biomolecules based on RNA technology. Focus on the design and tailoring of nanoparticles physical-chemical, morphological, and structural properties; on functionalization and protection of biologically-active molecules and biomolecules (in particular peptides and small RNAs); on nanomaterials advanced characterization.

Address: Via Granarolo 64, 48018 - Faenza (RA), Italy

Webpage: www.issmc.cnr.it

11/2022 – 08/2023:

Postdoctoral Research fellow at the Institute of Science, Technology and Sustainability for Ceramics (ISSMC CNR, former ISTE CNR) within the research project “NANOBIOCER: Nano-bioceramics per la salute e l’ambiente” (CUP B59J21026330005).

11/2019 – 11/2022:

Research Fellow at the Institute of Science and Technology for Ceramics (ISTE CNR) within the research project “An In Vitro and Ex Vivo Model of Biomimetic Regenerative Devices to Treat Bone Metastases and Soft Tissue Tumors: BIOBOS Project” (CUP B59J21026330005).

11/2016 – 11/2019:

Ph.D. student in Materials Science and Technology at the Institute of Science and Technology for Ceramics (ISTE CNR) and the University of Parma.

STUDIES AND POST-LAUREAM TRAININGS

- 06/2023 **Italian National Scientific Qualification as Associate Professor (2021/2023)** on Fundamentals of Chemical Sciences and Inorganic Systems (code 03/B1). Identifier: 18090. Validity period: 08/06/2023 – 08/06/2034.
- 2016 – 2019 **Ph. D. in Materials Science and Technology** (XXXII cycle) at the University of Parma. Thesis Title: *Tailoring Calcium Phosphate Nanoparticles For Medical Applications: A Functional By Design Approach*. Evaluation: Excellent. Additional Doctor Europaeus title for conducting the research work in an international context.
- 2019 **Conference and School on “Analysis of Diffraction Data in Real Space”**, Institute Laue-Langevin (ILL).
- 2018 **Summer School on “Scattering Methods applied to Soft Matter”**, University of Montpellier.
- 2017 **Summer School “To.Sca.Lake 2.0”**, Lake Como School of Advances Studies.
- 2014 – 2016 **Master’s Degree in Photochemistry and Molecular Materials** at the Department of Chemistry "G. Ciamician" of the University of Bologna. Thesis Title: Synthesis and Characterization of New Co-Crystals for Racemic Resolution. Evaluation: 110/110 Magna Cum Laude.
- 2011 – 2014 **Bachelor Degree in Chemistry and Materials Chemistry** at the Department of Chemistry "G. Ciamician" of the University of Bologna. Thesis Title: Sistemi Host-Guest Fotoattivi Basati su Calixareni. Evaluation: 110/110 Magna Cum Laude.

PROFESSIONAL SKILLS

Expert postdoctoral scientist specialized in biomaterials, nanomaterials, and bioceramic materials. Deep knowledge of biomineralization processes and on the tailored design of inorganic nanoparticles for medical, agricultural, cosmetic, and environmental application. His main research topic is the development of calcium phosphate nanoparticles functionalized with drugs, ions, molecules and biomolecules and the tailoring of their physicochemical properties for the desired applications.

Transversal skills:

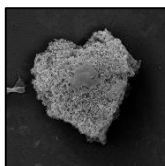
- Skillful disseminator, awarded several times for the best oral, visive or written presentations.
- Strong knowledge of the scientific language and on how to disseminate scientific results, having more than 40 peer-reviewed scientific articles published on international journals over 6 years of research activity – 35% of those as first author and 12% as corresponding author.
- Long-standing experience in working in international, interdisciplinary research teams for high level highly competitive projects (H2020, MSCA).
- Good knowledge of grant writing. He has won 2 grants and collaborated in writing of several national and international grant applications (PRIN, MSCA).

PERSONAL SKILLS

Italian: Mother tongue

English: Cambridge ESOL Proficient user (C1)

PRIZES AND AWARDS

- 2023 [Translational Award](#) attributed to a postdoctoral scientist presenting the best contribution in translational research at the "33th Annual Conference of the European Society for Biomaterials – ESB 2023". Presentation title: "Inhalable microparticles embedding calcium phosphate nanoparticles for cardiac drug delivery".
- 2023 [Image of the month](#) awarded from the Young Scientist Forum Board of the European Society for Biomaterials for the best biomaterials-related image for the month of February. Image title: "Nanohearth". 
- 2022 [Best Oral Presentation Award](#) for young researchers awarded by the Committee of the "BioMaH - Biomaterials and Novel Technologies for Healthcare, 3rd International Conference". Presentation title: "Ion doped, citrate stabilized amorphous calcium phosphate: a multifunctional material for preventive dentistry".
- 2022 [Second place](#) at the 11th National Competition "GiovedìScienza" focused on young researchers' scientific communication.
- 2021 [Special Award "Elena Benaduce"](#) for research works with direct and high impact on people's health and wellbeing within the 10th National Competition "GiovedìScienza" for the presentation "Nanoparticelle per la cura del cuore".
- 2021 [Third place](#) at the 10th National Competition "GiovedìScienza".
- 2020 [Best Startup Pitch Award](#) for young entrepreneurs in biomedical field awarded by the advanced short program on BioEntrepreneurship "BioBusiness2020" organized by the University of Italian Switzerland.
- 2019 [Best Poster Award](#) for young researchers awarded by the Committee of the "30th Annual Conference of the European Society for Biomaterials - ESB2019". Poster title: "Inhalable Calcium Phosphate Nanoparticles for Cardiac Drug Delivery".
- 2017 [Rotary Award "Guido Paolucci" for the Faculties of the University of Bologna](#) for the best Master's degree of the School of Mathematic, Physical and Natural Sciences for the academic year 2015-2016. Awarded by the Gruppo Felsineo of Rotary Club.
- 2013 – 2016 [Merit Award of the University of Bologna](#) for the best 10 students of the School of Mathematic, Physical and Natural Sciences (4 consequential awards for the academic years 2012-2013, 2013-2014, 2014-2015, 2015-2016).

PARTICIPATION OR DIRECTION OF NATIONAL OR INTERNATIONAL RESEARCH PROJECTS

Estimated starting date 01/2024

Research Personnel. Project Title: "Calcium phosphates materials with Nature inspired bactericidal surface: towards a non-antibiotic approach to treat bone infection. (CHANCE)".
Type: PRIN 2022.
Funding agency: Italian Ministry of University and Research, grant 2022CCN7WM.
Task: Development of antibacterial nanostructured surfaces based on calcium phosphate nanopillars.

09/2023 – current date

Research Personnel. Project Title: "Progetto PNRR CN00000041 "National Center for Gene Therapy and Drugs based on RNA Technology"".
Type: PNRR Project (NextGenerationEU funding).
Funding agency: Italian Ministry of University and Research, grant MUR n. 0001035.
Task: Synthesis, structural and morphological characterization of bioactive calcium phosphate nanoparticles. Functionalization of calcium phosphate nanoparticles with therapeutic biomolecules based on RNA technology.

06/2023 – current date

Research Personnel. Project Title: "Calcium phosphate nanocomposites for improving nutrient use efficiency and crop yield and reducing loss".
Type: USDA-NIFA-AFRI-009003.
Funding agency: National Institute of Food and Agriculture, United States Department of Agriculture, grant 2022-08579.
Task: Development of amorphous calcium phosphate nanoparticles doped with plant-relevant ions as innovative nanofertilizers.
Research outcomes: 1 scientific publication under peer review.

04/2022 – current date

Research Personnel. Project Title: "Antimicrobial peptides loaded inhalable calcium phosphate nanoparticles for the counteraction of antibiotic resistance: towards a new therapy for respiratory infections (AppliCare)".
Type: PRIN 2020.
Funding agency: Italian Ministry of University and Research, grant 202085RFNY.
Task: Development of bioactive calcium phosphate nanoparticles and their functionalization with innovative antimicrobial peptides.
Research outcomes: 2 scientific publications (DOI: 10.4028/p-lu147x; 10.1016/j.jinorgbio.2022.111751).

02/2022 – current date

Research Personnel. Project Title: "Extraction of bioactive compounds from fish industry byproducts and their application in the cosmetic field (SEARCULAR)".
Type: Research Projects @CNR.
Funding agency: Consiglio Nazionale delle Ricerche (Italian national research council).
Task: Extraction of calcium phosphate materials for cosmetic application from sources of the circular economy.
Research outcomes: 4 scientific publications (DOI: 10.1016/j.ceramint.2022.08.337; 10.1021/acsbio.2022.000680; 10.1111/ijac.13625; 10.3390/md18060309).

04/2021 – current date

Research Personnel. Project Title: "Ultra-small Nanohybrides for Advanced Theranostics (UNAT)".

Type: MSCA-RISE-2020.

Funding agency: European Commission - Horizon 2020, grant 101008159.

Task: Development of fluorescent carbon nanoparticles for theranostic biomedical application from sources of the circular economy.

Research outcomes: 1 scientific publication (DOI: 10.3390/jfb14020090).

08/2019 – 09/2019

Project Principal Investigator. Project Title: "Calcium Phosphate - Bioactive Glass Core-Shell Nanoparticles for Dental Remineralization".

Type: Mobility grant.

Funding agency: Journal of European Ceramic Society Trust (JECS Trust), grant 2019209.

Task: Grant acquisition. Synthesis and characterization of composite nanomaterials and core-shell nanomaterials based on calcium phosphate and bioactive glass.

Research outcomes: 1 patent (Italian Patent Office ID 102022000026496), 1 scientific publication under peer review.

10/2018 – current date

Research Personnel. Project Title: "An in vitro and ex vivo model of biomimetic regenerative devices to treat bone metastases and soft tissue tumors (BIOBOS)".

Type: Bando Finalizzata 2016.

Funding agency: Italian Ministry of Health, grant GR-2016-02364704.

Task: Development of calcium phosphate materials and their functionalization with innovative antitumor drugs for the treatment of bone tumor.

09/2018 – 09/2020

Research Personnel. Project Title: "Nanoparticelle biocompatibili ed inalabili funzionalizzate con peptidi antimicrobici per contrastare la formazione di biofilm e l'antibiotico resistenza: verso una nuova potenziale terapia per le infezioni correlate alla fibrosi cistica" (biocompatible and inhalable nanoparticles functionalized with antimicrobial peptides for treating the development of biofilm and antibiotic resistance: towards a new potential therapy for the infections related to cystic fibrosis).

Type: Grant call 2018.

Funding agency: Fondazione per la Ricerca sulla Fibrosi Cistica – Onlus (Italian Foundation for the Research on the Cystic Fibrosis), grant FFC#20/2018.

Task: Development of calcium phosphate nanoparticles and their functionalization with antimicrobial drugs for the treatment of cystic fibrosis.

Research outcomes: 1 scientific publication (DOI: 10.1016/j.jinorgbio.2022.111751).

02/2018

Project Principal Investigator. Project Title: "Role of small dicarboxylic acids on hydroxyapatite crystal growth by time resolved in-situ SAXS/WAXS".

Type: Synchrotron beamline access grant at the SAXS beamline of "ELETTRA Sincrotrone Trieste".

Funding agency: CERIC-ERIC consortium, grant 20175403.

Task: Grant acquisition. Data acquisition, analysis, and interpretation of in situ, simultaneous SAXS/WAXS scattering with synchrotron light during the crystallization of nano-hydroxyapatite in presence of template molecules.

Research outcomes: 3 scientific publications (DOI: 10.1039/D2CE01227H; 10.1016/j.bioactmat.2021.01.010; 10.1021 /acs.cgd.0c00038).

02/2018 –06/2019

Research Personnel. Project Title: "Multimodal imaging of the in vivo fate of bone transplants (VIVOIMAG)".

Type: H2020-MSCA-RISE-2014.

Funding agency: European Commission - Horizon 2020, grant 654757.

Task: Functionalization of calcium phosphate nanoparticles with radioligands for in vivo imaging application.

02/2017 – 06/2019

Research Personnel. Project Title: "CUPIDO - cardio ultraefficient nanoparticles for inhalation of drug products".

Type: H2020-Eu.2.1.2 - INDUSTRIAL LEADERSHIP, call NMBP-10-2016.

Funding agency: European Commission - Horizon 2020, grant 720834.

Task: Development of calcium phosphate nanoparticles and their functionalization with therapeutic drugs and biomolecules for the treatment of the cardiovascular diseases. Nanoparticles production process scale-up and validation.

Research outcomes: 5 scientific publications (DOI: 10.1016/j.jddst.2022.103719; 10.3390/pharmaceutics13111825;10.3390/cryst10100953; 10.1126/scitranslmed.aan6205; 10.3390/jfb14040189), contribution in the writing of 2 patents (WO2016102576A1; WO2022053955A1) and 1 spin-off (Nanophoria srl).

11/2016 – current date

Research Personnel. Project Title: "Materiali nanostrutturati per applicazioni dentali e maxillofacciali" (nanostructured materials for dental and maxillofacial application).

Type: Self-funded CNR-ISTEC Project; call PGDP ISTEC-CNR (2020-2021) DCM.AD003.061.

Research outcomes: > 5 scientific publications.

PARTICIPATION TO INDUSTRIAL RESEARCH PROJECTS

04/2021 – current date

Research personnel. Project title: CNR-ISSMC (former CNR-ISTEC) analyses for third party activity.

Funding type: Analyses for third party commissioned by Natural Development Group srl.

Protocol: Offerte CNR-ISSMC MI-2022/03 e CNR-ISTEC MI-2021/07.

Task: Chemical, compositional, crystallographic and spectroscopic analyses of hydroxyapatite and other calcium phosphate suspensions and study of their evolution over time.

Research Products contribution: Technical Report (RT ISTEC protocol N. 2057 03/11/2022).

01/2019 – 12/2020

Research personnel. Project title: CNR-ISTEC research activity for the enhancement of the patent CNR N. 102018000006753 for improving its remineralizing properties and regenerating dental enamel and dentine. Protocol CNR ISTEC N. 0001434 del 09/05/2016.

Funding type: Research project funded by Curasept A.D.S. srl.

Task: Development of stabilized amorphous calcium phosphate and its functionalization with relevant ions for preventive dentistry.

Research Products contribution: fulfilment of the project objectives and extension of the above-mentioned patent.

01/2017 – current date

Research personnel. Project title: CNR-ISTEC analyses for third party activity.

Funding type: Analyses for third party commissioned by Kalichem Italia srl.
Task: Chemical, compositional, crystallographic and spectroscopic analyses of hydroxyapatite and other calcium phosphate suspensions.

Research Products contribution: Technical Report (RT ISTEC protocol N. 293 26/02/2021, N. 217 17/02/2021, N. 33 13/01/2021, N. 2274 04/11/2020, N. 2065 27/10/2020, N. 2021 13/10/2020, N. 1222 26/06/2020, N. 135 21/01/2020, N. 83 14/01/2020, N. 2561 06/12/2019, N. 1553 19/07/2019, N. 1405 02/07/2019, N. 581 20/03/2019, N. 360 19/02/2019, N. 102 21/01/2019, N. 2124 09/10/2018, N. 2161 12/10/2018).

RESEARCH EXPERIENCES ABROAD

08/2022

Visiting Scientist at Bioemission Technology Solutions, R&D spin-off in the field of medical imaging for research purposes, Athens, Greece. Supervisor Dr. Antonis Skliris.

Visit performed within the Action MSCA RISE 101008159 "UNAT - Ultra-small Nanohybrides for Advanced Theranostics".

Research focus on the development of carbon nanoparticles from circular economy sources for diagnostics and in vivo fluorescence imaging.

08/2019

Visiting Scientist at the Institute of Biomaterials of the Department of Materials Science and Engineering of the Friedrich-Alexander University of Erlangen-Nuremberg, Germany. Supervisor Prof. Aldo R. Boccaccini.

Visit performed within the Mobility program of the Trust of the Journal of European Ceramics Society (JECS Trust contract no. 2019209).

Research focus on the development of composite materials based on calcium phosphate and bioactive glasses.

08/2018 – 09/2018

Visiting Scientist at the University of West Attica and at the NCSR Demokritos (Athens, Greece). Supervisor Prof. George Loudos.

Visit performed within the Action MSCA RISE 645757 "VIVOIMAG - Multimodal imaging of the in vivo fate of bone transplants".

Research focus on the development of calcium phosphate nanoparticles functionalized with radiolabels for diagnostics and in vivo multimodal imaging.

NATIONAL OR INTERNATIONAL COLLABORATIONS

01/2022 – current date

Direction. National collaboration on the topic "Development of oriented calcium phosphate crystal arrays for biomedical application" with the following partners: Prof. Francesca Bugli (Catholic Univ. of the Sacred Heart, Roma), Dr. Cinzia Giannini, Dr. Davide Lamura (IC CNR, Bari). Scientific articles related to the collaboration (DOI): 10.1039/C9CE00508K.

01/2022 – current date

Participation. National collaboration on the topic "Extraction of biomaterials for cosmetic application from circular economy sources" with the following partners: Dr. Clara Piccirillo (NANOTEC CNR, Lecce), Dr. Teresa Sibillano (IC CNR, Bari), Dr. Alberto Vitali (SCITEC CNR, Roma). Scientific articles related to the collaboration (DOI): 10.1016/j.ceramint.2022.08.337; 10.1021/acsbmaterials.2c00680; 10.1111/ijac.13625; 10.3390/md18060309.

04/2021 – current date

Participation. International collaboration on the topic "Development of luminescent carbon nanoparticles from circular economy sources for theranostics and multimodal imaging" with the following partners: Prof. George Loudos e Dr. Antonis Skliris (Bioemission Technology Solutions, Athens, Greece), Prof. Vladimir Lysenko (Univ. Lyon 1, Lyon, France). Scientific articles related to the collaboration (DOI): 10.3390/jfb14020090.

01/2020 – current date

Participation. National collaboration on the topic "Surface studies of calcium phosphate nanoparticles" with the following partners: Prof. Lorenzo Mino (Univ. of Torino), Prof. Antonella Gervasini (Univ. of Milano). Scientific articles related to the collaboration (DOI): 10.1016/j.apsusc.2022.153495.

01/2019 – current date

Participation. National collaboration on the topic "Inhalable nanomaterials functionalized with antimicrobial peptides for the counteraction of antibiotics resistance" with the following partners: Dr. Alberto Vitali (SCITEC CNR, Roma), Prof. Francesca Bugli e Prof. Maurizio Sanguinetti (Catholic Univ. of the Sacred Heart, Roma). Scientific articles related to the collaboration (DOI): 10.4028/p-lu147x; 10.1016/j.jinorgbio.2022.111751.

01/2019 – current date

Direction. International collaboration on the topic "Preparation of bioactive composites based on bioactive glasses and calcium phosphates" with the following partners: Prof. Aldo R. Boccaccini (Univ. of Erlangen-Nuremberg, Germany), Prof. Kai Zheng (Medical Univ. of Nanjing, China). Patents related to the collaboration: Italian Patent Office n. 102022000026496.

01/2019 – current date

Direction. International collaboration on the topic "Study of thermal crystallization of amorphous calcium phosphate" with the following partners: Dr. Aurelién Canizares (CEHMTI CNRS, Orléans, France), Dr. Julietta V. Rau (ISM CNR, Roma), Prof. Smilja Markovic (SASA, Belgrade, Serbia), Dr. Vuk Uskokovic (Tardigradenano LLC, California, USA). Scientific articles related to the collaboration (DOI): 10.1039/D2CP02352K; 10.1039/D1TB00601K.

02/2018 – current date

Direction. National collaboration on the topic "Study of hydroxyapatite nanoparticles crystallization in presence of ions and template molecules" with the following partners: Dr. Cinzia Giannini, Dr. Dritan Siliqi (IC CNR, Bari). Scientific articles related to the collaboration (DOI): 10.1039/D2CE01227H; 10.1016/j.bioactmat.2021.01.010; 10.1021/acs.cgd.0c00038.

01/2018 – current date

Participation. International collaboration on the topic "Calcium phosphate nanofertilizers" with the following partners: Prof. Luca Marchiol e Prof. Enrico Braidot (Univ. of Udine), Prof. Jong-Rok Jeon (Univ. of Gyeongsang, Jinju, South Korea), Prof. Deb Jaisi (Univ. of Delaware, USA). Scientific articles related to the collaboration (DOI): 10.1021/acs.jafc.1c05187; 10.1016/j.jece.2020.104815; 10.1021/acsomega.9b04354; 10.3390/agronomy9040161.

01/2017 – current date

Participation. International collaboration on the topic "Inhalable nanoparticles functionalized with drugs for the treatment of cardiovascular diseases" with the following partners: Dr. Daniele Catalucci (IRGB CNR, Humanitas Research Hospital, Milano), Dr. Alessio Alogna (University Clinic Charité, Berlin, Germany), Prof. Paolo Colombo e Prof. Francesca Buttini (Univ. of Parma). Scientific articles related to the collaboration (DOI): 10.1016/j.jddst.2022.103719; 10.3390/pharmaceutics13111825; 10.3390/cryst10100953; 10.1126/scitranslmed.aan6205.

11/2016 – current date

Participation. International collaboration on the topic "Preparation of biomimetic calcium phosphate nanoparticles" with the following partners: Dr. Jaime Gomez-Morales (Crystallographic Studies Lab, IACT-CSIC-UGR, Granada, Spain), Prof. José Manuel Delgado-Lopez (Univ. of Granada, Spain). Scientific articles related to the collaboration (DOI): 10.3390/nano12081257; 10.3390/cryst9010013.

11/2016 – current date

Participation. International collaboration on the topic "Calcium phosphate nanoparticles for antitumor application" with the following partners: Prof. Sander C. G. Leeuwenburgh (Univ. and Medical Centre of Radboud, Nijmegen, Nederland), Prof. Nicola Margiotta (Univ. of Bari), Dr. Silvia Scaglione (IEIT CNR, Genova). Scientific articles related to the collaboration (DOI): 10.1016/j.jinorgbio.2020.111334; 10.1039/D0NR04064A; 10.1039/D0TB00390E.

11/2016 – current date

Participation. International collaboration on the topic "Bioactive calcium phosphate materials as remineralizing and antibacterial agents in preventive dentistry" with the following partners: Prof. Eugenio Brambilla, Prof. Andrei C. Ionescu (Univ. of Milano), Prof. Nicoleta Ilie (Univ. Ludwig-Maximilians of Munich, Germany). Scientific articles related to the collaboration (DOI): 10.1038/s41598-022-09787-5; 10.3389/fmats.2022.84613; 10.3390/ma13132928; 10.1038/s41598-018-35258-x.

TEACHING ACTIVITIES

- 2023 **Curricular Internship Tutor and Thesis Co-Relator** of a student of the Bachelor's Degree in Chemistry and Technologies for the Environment and Materials of the Department of Industrial Chemistry "Toso Montanari", University of Bologna. Candidate: Antonio Vitucci. Thesis title: "Sviluppo di nanoparticelle di calcio fosfato drogate con ioni bioattivi mediante metodi di cristallizzazione non convenzionali." (Development of calcium phosphate nanoparticles doped with bioactive ions through non-conventional crystallization methods).
- 2015 – 2016 **Didactic Tutor** for the Bachelor's Degree in Chemistry and Materials Chemistry at the Department of Chemistry "G. Ciamician" of the University of Bologna.
- 2014 – 2016 **Didactic Lab assistant** – part-time collaboration of the University of Bologna at the Department of Chemistry "G. Ciamician" and Department of Industrial Chemistry "Toso Montanari". Assistant at the didactic lab for the classes of Instrumental Analytical Chemistry, Chemistry, and Inorganic Chemistry (Bachelor's Degree in Chemistry and Materials Chemistry, academic year 2014/2015, and Bachelor's Degree in Industrial Chemistry, academic year 2015/2016).

DISSEMINATION ACTIVITIES

- 2023 **Dissemination of scientific research activities to the general public** for the ISSMC CNR Open Day of 13/04/2023 – Organization and coordination of the experience "Non Si Butta Via Niente": public exposition of the research activities in the field of circular economy for health and environment with practical lab experiences. Prot. ISSMC n. 0129797.
- 2023 **Dissemination of scientific research activities** for the students of the middle school "Bendandi" (Faenza, RA) – introduction to the research activities in the field of nanomedicine with practical lab experiences. Prot. ISSMC n. 0092367 e n. 0092372.

EDITORIAL ACTIVITIES

2018 – current date:

Official peer-reviewer for international peer-reviewed journals: ACS Biomaterials Science & Engineering (ISSN: 2373-9878), Bioactive Materials (ISSN: 2452-199X), Biomaterials Science (ISSN: 2047-4849), Biomimetics (ISSN: 2313-7673), Crystals (ISSN: 2073-4352), CrystEngComm (ISSN: 1466-8033), Drug Development and Industrial Pharmacy (ISSN: 1520-5762), Journal of Colloid and Interface Science (ISSN: 1095-7103), Journal of Materials Chemistry B (ISSN: 2050-7518), Materials Letters (ISSN: 1873-4979), Materials (ISSN: 1996-1944), Minerals (ISSN: 2075-163X), Nature Communications (ISSN: 2041-1723), Scientific Reports (ISSN: 2045-2322).

2022 – current date:

Invited Guest Editor for the Special Issue "Antimicrobial Nanotechnologies: A Mighty Weapon to Fight the Spreading of Antibiotic Resistance" of the international peer-reviewed journal Frontiers in Nanotechnologies (ISSN 2673-3013). Special Issue co-edited with Dr. Lukas Gritsch (Technogym S.p.A.) and Dr. Kai Zheng (Nanjing Medical University, Nanjing, China).

PARTICIPATION TO NATIONAL OR INTERNATIONAL SCIENTIFIC CONGRESSES

- 04-08/09/2023 **Poster presentation** "Inhalable microparticles embedding calcium phosphate nanoparticles for cardiac drug delivery" at the conference "33th Annual Conference of the European Society for Biomaterials – ESB 2023", Davos. [Winner of ESB Translational award.](#)
- 18-21/10/2022 **Oral presentation** "Ion doped, citrate stabilized amorphous calcium phosphate: a multifunctional material for preventive dentistry" at the conference "BioMaH - Biomaterials and Novel Technologies for Healthcare, 3rd International Conference", Roma. [Winner of Best Oral Presentation Award.](#)
- 20-23/09/2022 **Oral presentation** "Thermal crystallization of citrate-stabilized amorphous calcium phosphate into apatite: an in situ, real time study" at the conference "Symposium and Annual Meeting of the International Society for Ceramics in Medicine – Bioceramics32", Venezia - Mestre.
- 20-23/09/2022 **Poster presentation** "Development of core-shell calcium phosphate @ iron oxide nanoparticles for stimulated production of exosomes from stem cells" at the conference "Symposium and Annual Meeting of the International Society for Ceramics in Medicine – Bioceramics32", Venezia - Mestre.
- 23-24/06/2022 **Oral presentation** "Use of Amorphous Calcium Phosphate as Innovative Precursor for the Synthesis of Hydroxyapatite Biomaterials" at the conference "Advanced Inorganic Materials: green and unconventional synthesis approaches and functional assessment – AIM 2022", Bari.
- 14-23/09/2021 **Oral presentation** "Crystallization of amorphous calcium phosphate to hydroxyapatite nanoparticles: new insights in the field of biomaterials and biomineralization" at the conference "XXVII Congresso Nazionale della Società Chimica Italiana - SCI2021", online.
- 9-13/09/2019 **Poster presentation** "Inhalable Calcium Phosphate Nanoparticles for Cardiac Drug Delivery" at the conference "30th Annual Conference of the European Society for Biomaterials – ESB 2019", Dresden. [Winner of Best Poster award.](#)
- 29/08/2019 **Invited Seminar** "ISTEC CNR Bioceramics and Bio-Hybrid Composites Group: calcium phosphates from nanoparticles to organized hierarchical 3-dimensional scaffolds". Seminar on the research activities at the Friedrich-Alexander University of Erlangen-Nuremberg invited by the Head of the Institute of Biomaterials of the Department of Materials Science and Engineering Prof. Aldo R. Boccaccini.
- 12-14/06/2019 **Poster presentation** "Inhalable Calcium Phosphate Nanoparticles for Cardiac Drug Delivery" at the conference "EuroNanoForum 2019 – Nanotechnology and Advanced Materials Progress Under Horizon2020 and Beyond", Bucarest.
- 4-5/04/2019 **Invited Oral presentation** "Citrate-stabilized amorphous calcium phosphate doped with fluoride ions: a new biomimetic nanomaterial in dentistry" at the conference "TRACE-2: Tissue Regeneration: Advanced Ceramics and Composites", Lovenno di Menaggio (Como).
- 8-11/10/2018 **Poster presentation** "Citrate-stabilized amorphous calcium phosphate doped with fluoride ions: a new biomimetic nanomaterial in dentistry" at the conference "BioMaH - Biomaterials and Novel Technologies for Healthcare, 2nd International Conference", Frascati.
- 2-6/07/2018 **Session Chair** "Crystallization processes" at the conference "25th International Symposium On Metastable, Amorphous and Nanostructured Materials – ISMANAM", Roma.
- 2-6/07/2018 **Oral presentation** "Influence of citrate and other small dicarboxylic acids on hydroxyapatite nanocrystal nucleation, growth and surface properties" at the conference "25th

International Symposium On Metastable, Amorphous and Nanostructured Materials – ISMANAM", Roma.

- 25-27/10/2017 **Poster presentation** "Citrate stabilized amorphous calcium phosphate doped with fluoride ions: a promising material for enamel remineralization" at the conference "Symposium and Annual Meeting of the International Society for Ceramics in Medicine – Bioceramics29", Tolosa.
- 25-27/10/2017 **Poster presentation** "Bio-inspired synthetic strategies of hydroxyapatite nanocrystals: from biomineralization to regenerative medicine and drug delivery" at the conference "Conferenza di Dipartimento Scienze Chimiche e Tecnologie dei Materiali del CNR - DSTCM 2017", Alghero.
- 24-26/05/2017 **Oral presentation** "Micro-Embedded Calcium Phosphate Nanoparticles For Targeted Cardiac Drug Delivery" at the conference "Congresso annuale Società Italiana Biomateriali – SIB 2017", Milano.

SCIENTIFIC PUBLICATIONS – BIBLIOMETRIC PARAMETERS (SOURCE: CLARIVATE WEB OF SCIENCE)

Publication number:	44 (15 as first author and 6 as corresponding author)
High-impact articles featured on journal cover:	5
Book chapters:	2
Patents:	1
h-index:	13
Total citations:	602

SCIENTIFIC ARTICLES FEATURED AS JOURNAL COVER

2021 **Journal Cover Article** for the article “Degli Esposti et al., Thermal crystallization of amorphous calcium phosphate combined with citrate and fluoride doping: a novel route to produce hydroxyapatite bioceramics” pubblicata sul Journal of Materials Chemistry B.



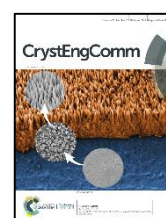
2021 **Journal Cover Article** for the article “Ideia-Degli Esposti et al., Extraction and characterization of hydroxyapatite-based materials from grey triggerfish skin and black scabbardfish bones” pubblicata su Applied Ceramic Technology.



2020 **Journal Inner Cover Article** for the article “Yoon et al., Synergistic Release of Crop Nutrients and Stimulants from Hydroxyapatite Nanoparticles Functionalized with Humic Substances: Toward a Multifunctional Nanofertilizer ” pubblicata su ACS Omega.



2019 **Journal Inner Cover Article** for the article “Carella et al., Role of citrate in the formation of enamel-like calcium phosphate oriented nanorod arrays” pubblicata su CrysEngComm.



2018 **Journal Cover Article** for the article “Miragoli et al., Inhalation of peptide-loaded nanoparticles improves heart failure” pubblicata su Science Translational Medicine.



IN EXTENSO PUBLICATIONS LIST

IN INTERNATIONAL PEER-REVIEWED JOURNALS

1. Sakhno, Y., **Degli Esposti, L.**, Adamiano, A., Borgatta, J., Cahill, M., Vaidya, S., White, J.C., Iafisco, M., Jaisi, D.P. Citrate-Stabilized Amorphous Calcium Phosphate Nanoparticles Doped with Micronutrients as a Highly Efficient Nanofertilizer for Environmental Sustainability. *ACS Agricultural Science & Technology*, **2023**.
2. Quarta, E., Chiappi, M., Adamiano, A., Tampieri, A., Wang, W., Tetley, T.D., Buttini, F., Sonvico, F., Catalucci, D., Colombo, P., Iafisco M., **Degli Esposti, L.***, Inhalable Microparticles Embedding Biocompatible Magnetic Iron-Doped Hydroxyapatite Nanoparticles. *Journal of Functional Biomaterials*, **2023**.
3. Mancini, F., Menichetti, A., **Degli Esposti, L.**, Montesi, M., Panseri S., Bassi, G., Montalti, M., Lazzarini, L., Adamiano, A., Iafisco M., Fluorescent Carbon Dots from Food Industry By-Products for Cell Imaging. *Journal of Functional Biomaterials*, **2023**.
4. Siliqi, D., Adamiano, A., Ladisa, M., Giannini, C., Iafisco, M., **Degli Esposti, L.***, Formation of calcium phosphate nanoparticles in the presence of carboxylate molecules: a time-resolved in situ synchrotron SAXS and WAXS study. *CrystEngComm*, **2023**.
5. Falini, G., Basile, M. L., Gandolfi, S., Carella, C., Guarini, G., **Degli Esposti, L.**, Iafisco, M., Adamiano, A., Natural calcium phosphates from circular economy as adsorbent phases for the remediation of textile industry waste-waters. *Ceramics International*, **2023**.
6. Adamiano, A., Carella, F., **Degli Esposti, L.**, Piccirillo, C., Iafisco, M., Calcium Phosphates from Fishery Byproducts as a Booster of the Sun Protection Factor in Sunscreens. *ACS Biomaterials Science & Engineering*, **2022**.
7. **Degli Esposti, L.**; Fosca, M.; Canizarés, A.; Del Campo, L.; Ortenzi, M.; Adamiano, A.; Rau, J. V.; Iafisco, M., An in situ study of thermal crystallization of amorphous calcium phosphates. *Phys. Chem. Chem. Phys.*, **2022**, *24*, 24514-24523.
8. Quarta, E., **Degli Esposti, L.**, Bettini, R., Sonvico, F., Catalucci, D., Iafisco, M., De Luca, C., Trevisi, G., Colombo, P., Rossi, A., Buttini, F., Colombo, G. Dry powder inhalation technology for heart targeting applied to calcium phosphate nanoparticles loaded with active substances. *Journal of Drug Delivery Science and Technology*, **2022**, 103719.
9. Casado, G. E., Ivanchenko, P., Paul, G., Bisio, C., Marchese, L., Ashrafi, A. M., Milosavljevic, V., **Degli Esposti, L.**, Iafisco, M., Mino, L. Surface and structural characterization of Cu-exchanged hydroxyapatites and their application in H₂O₂ electrocatalytic reduction. *Applied Surface Science*, **2022**, *595*, 153495.
10. Iafisco, M.; Carella, F.; **Degli Esposti, L.**; Adamiano, A.; Catalucci, D.; Modica, J.; Bragonzi, A.; Vitali, A.; Torelli, R.; Sanguinetti, M.; Bugli, F Biocompatible antimicrobial colistin loaded calcium phosphate nanoparticles for the counteraction of biofilm formation in cystic fibrosis related infections. *Journal of Inorganic Biochemistry* **2022**, *230*, 111751.
11. Ionescu, A.C.; **Degli Esposti, L.**; Iafisco, M.; Brambilla, E. Enamel Remineralization and Dentine Tubules Occlusion by Bioactive Formulations Based on Ion-Doped Nanohydroxyapatite and Precursor Nanoparticles. *Scientific Reports* **2022**, *12*, 1-16.

12. Gómez-Morales, J.; Fernández-Penas, R.; Acebedo-Martínez, F.J.; Romero-Castillo, I.; Verdugo-Escamilla, C.; Choquesillo-Lazarte, D.; **Degli Esposti, L.**; Jiménez-Martínez, Y.; Fernández-Sánchez, J.F.; Iafisco, M.; Boulaiz, H. Luminescent Citrate-Functionalized Terbium-Substituted Carbonated Apatite Nanomaterials: Structural Aspects, Sensitized Luminescence, Cytocompatibility, and Cell Uptake Imaging. *Nanomaterials*, **2022**, *12*, 1257.
13. **Degli Esposti, L.**; Iafisco, M. Amorphous calcium phosphate, the lack of order is an abundance of possibilities. *Biomaterials and Biosystems* **2022**, *5*, 100037.
14. **Degli Esposti, L.**; Ionescu, A. C.; Carella, F.; Adamiano, A.; Brambilla, E.; Iafisco, M. Antimicrobial Activity of Remineralizing Ion-Doped Amorphous Calcium Phosphates for Preventive Dentistry. *Frontiers in Materials* **2022**, *9*, 846130.
15. Barghi, A.; **Degli Esposti, L.**; Iafisco, M.; Adamiano, A.; Casado, G. E.; Ivanchenko, P.; Mino, L.; Yoon, H. Y.; Joe, E.-N.; Jeon, J.-R.; Chang, Y. S. Microbial Volatile Organic Compound (VOC)-Driven Dissolution and Surface Modification of Phosphorus-Containing Soil Minerals for Plant Nutrition: An Indirect Route for VOC-Based Plant–Microbe Communications. *Journal of Agricultural and Food Chemistry*, **2021**, *69*, 14478-14487.
16. Quarta, E.; Sonvico, F.; Bettini, R.; De Luca, C.; Dotti, A.; Catalucci, D.; Iafisco, M.; **Degli Esposti, L.**; Colombo, G.; Trevisi, G.; Rekkas, D. M.; Rossi, A.; Wong, T. W.; Buttini, F.; Colombo P. Dry Powder Inhaler of Calcium Phosphate Nanoparticles for Heart Targeting: The Experimental Design of the Powder for Inhalation *Pharmaceutics* **2021**, *13*, 1825.
17. Carella, F.; **Degli Esposti, L.**; Adamiano, A.; Iafisco, M. The Use of Calcium Phosphates in Cosmetics, State of the Art and Future Perspectives. *Materials* **2021**, *14*, 6398.
18. **Degli Esposti, L.***; Markovic, S.; Ignjatovic, N.; Panseri, S.; Montesi, M.; Adamiano, A.; Fosca, M.; Rau, J. V.; Uskokovic, V.; Iafisco, M. Thermal crystallization of amorphous calcium phosphate combined with citrate and fluoride doping: a novel route to produce hydroxyapatite bioceramics. *J. Mater. Chem. B*. **2021**, *9*, 4832-4845.
19. Tampieri, A.; Sandri, M.; Iafisco, M.; Panseri, S.; Montesi, M.; Adamiano, A.; Dapporto, M.; Campodoni, E.; Dozio, S. M.; **Degli Esposti, L.**; Sprio, S. Nanotechnological approach and bio-inspired materials to face degenerative diseases in aging. *Aging Clin Exp Res* **2021**, *33*, 805–821.
20. **Degli Esposti, L.***; Adamiano, A.; Siliqi, D.; Giannini, C.; Iafisco, M. The effect of chemical structure of carboxylate molecules on hydroxyapatite nanoparticles. A structural and morphological study. *Bioactive materials* **2021**, *6*, 2360-2371.
21. Carella, F.; Seck, M.; **Degli Esposti, L.**; Diadiou, H.; Maienza, A.; Baronti, S.; Vignaroli, P.; Vaccari, F.P.; Iafisco, M.; Adamiano, A. Thermal conversion of fish bones into fertilizers and biostimulants for plant growth—A low tech valorization process for the development of circular economy in least developed countries. *Journal of Environmental Chemical Engineering* **2021**, *9*, 104815.
22. Ideia, P.; **Degli Esposti, L.**; Miguel, C.C.; Adamiano, A.; Iafisco, M.; Castilho, P.C. Extraction and characterization of hydroxyapatite-based materials from grey triggerfish skin and black scabbardfish bones. *International Journal of Applied Ceramic Technology* **2021**, *18*, 235-243. [Wiley Top Cited Article 2021-2022](#)
23. Barbanente, A.; Palazzo, B.; **Degli Esposti, L.**; Adamiano, A.; Iafisco, M.; Ditaranto, N.; Migoni, D.; Gervaso, F.; Nadar, R.; Ivanchenko, P. Selenium-doped hydroxyapatite nanoparticles for potential application in bone tumor therapy. *J. Inorg. Biochem.* **2020**, *215*, 111334.

24. **Degli Esposti, L.**; Dotti, A.; Adamiano, A.; Fabbi, C.; Quarta, E.; Colombo, P.; Catalucci, D.; De Luca, C.; Iafisco, M. Calcium Phosphate Nanoparticle Precipitation by a Continuous Flow Process: A Design of an Experiment Approach. *Crystals* **2020**, *10*, 953.
25. Scialla, S.; Carella, F.; Dapporto, M.; Sprio, S.; Piancastelli, A.; Palazzo, B.; Adamiano, A.; **Degli Esposti, L.**; Iafisco, M.; Piccirillo, C. Mussel Shell-Derived Macroporous 3D Scaffold: Characterization and Optimization Study of a Bioceramic from the Circular Economy. *Marine drugs* **2020**, *18*, 309.
26. **Degli Esposti, L.***; Adamiano, A.; Tampieri, A.; Ramirez-Rodriguez, G.B.; Siliqi, D.; Giannini, C.; Ivanchenko, P.; Martra, G.; Lin, F.-H.; Delgado-López, J.M. Combined effect of citrate and fluoride ions on hydroxyapatite nanoparticles. *Cryst. Growth Des.* **2020**.
27. Yoon, H.Y.; Lee, J.G.; **Degli Esposti, L.**; Iafisco, M.; Kim, P.J.; Shin, S.G.; Jeon, J.-R.; Adamiano, A. Synergistic Release of Crop Nutrients and Stimulants from Hydroxyapatite Nanoparticles Functionalized with Humic Substances: Toward a Multifunctional Nanofertilizer. *ACS omega* **2020**, *5*, 6598-6610.
28. **Degli Esposti, L.**; Ionescu, A.C.; Brambilla, E.; Tampieri, A.; Iafisco, M. Characterization of a Toothpaste Containing Bioactive Hydroxyapatites and In Vitro Evaluation of Its Efficacy to Remineralize Enamel and to Occlude Dentinal Tubules. *Materials* **2020**, *13*, 2928.
29. Nadar, R.A.; Asokan, N.; **Degli Esposti, L.**; Curci, A.; Barbanente, A.; Schlatt, L.; Karst, U.; Iafisco, M.; Margiotta, N.; Brand, M. Preclinical evaluation of platinum-loaded hydroxyapatite nanoparticles in an embryonic zebrafish xenograft model. *Nanoscale* **2020**, *12*, 13582-13594.
30. Barbanente, A.; Nadar, R.A.; **Degli Esposti, L.**; Palazzo, B.; Iafisco, M.; Van Den Beucken, J.J.; Leeuwenburgh, S.C.; Margiotta, N. Platinum-loaded, selenium-doped hydroxyapatite nanoparticles selectively reduce proliferation of prostate and breast cancer cells co-cultured in the presence of stem cells. *Journal of Materials Chemistry B* **2020**, *8*, 2792-2804.
31. Marchiol, L.; Filippi, A.; Adamiano, A.; **Degli Esposti, L.**; Iafisco, M.; Mattiello, A.; Petrusa, E.; Braidot, E. Influence of hydroxyapatite nanoparticles on germination and plant metabolism of tomato (*Solanum lycopersicum* L.): Preliminary evidence. *Agronomy* **2019**, *9*, 161.
32. Carella, F.; **Degli Esposti, L.**; Barreca, D.; Rizzi, G.A.; Martra, G.; Ivanchenko, P.; Casado, G.E.; Morales, J.G.; López, J.M.D.; Tampieri, A. Role of citrate in the formation of enamel-like calcium phosphate oriented nanorod arrays. *CrystEngComm* **2019**, *21*, 4684-4689.
33. Gómez Morales, J.; Fernández Penas, R.; Verdugo-Escamilla, C.; **Degli Esposti, L.**; Oltolina, F.; Prat, M.; Iafisco, M.; Fernández Sánchez, J. Bioinspired Mineralization of Type I Collagen Fibrils with Apatite in Presence of Citrate and Europium Ions. *Crystals* **2019**, *9*, 13.
34. Iafisco, M.; **Degli Esposti, L.**; Ramírez-Rodríguez, G.B.; Carella, F.; Gómez-Morales, J.; Ionescu, A.C.; Brambilla, E.; Tampieri, A.; Delgado-López, J.M. Fluoride-doped amorphous calcium phosphate nanoparticles as a promising biomimetic material for dental remineralization. *Sci. Rep.* **2018**, *8*, 17016.
35. **Degli Esposti, L.***; Carella, F.; Adamiano, A.; Tampieri, A.; Iafisco, M. Calcium phosphate-based nanosystems for advanced targeted nanomedicine. *Drug Dev. Ind. Pharm.* **2018**, *44*, 1223-1238.
36. Miragoli, M.; Ceriotti, P.; Iafisco, M.; Vacchiano, M.; Salvarani, N.; Alogna, A.; Carullo, P.; Ramirez-Rodríguez, G.B.; Patrício, T.; **Degli Esposti, L.** Inhalation of peptide-loaded nanoparticles improves heart failure. *Science translational medicine* **2018**, *10*, eaan6205.

37. Bianchi, M.; **Degli Esposti, L.**; Ballardini, A.; Liscio, F.; Berni, M.; Gambardella, A.; Leeuwenburgh, S.C.; Sprio, S.; Tampieri, A.; Iafisco, M. Strontium doped calcium phosphate coatings on poly (etheretherketone)(PEEK) by pulsed electron deposition. *Surf. Coat. Technol.* **2017**, *319*, 191-199.
38. Orlandini, G.; Ragazzon, G.; Zanichelli, V.; **Degli Esposti, L.**; Baroncini, M.; Silvi, S.; Venturi, M.; Credi, A.; Secchi, A.; Arduini, A. Plugging a bipyridinium axle into multichromophoric calix [6] arene wheels bearing naphthyl units at different rims. *ChemistryOpen* **2017**, *6*, 64.
39. Shemchuk, O.; **Degli Esposti, L.**; Grepioni, F.; Braga, D. Ionic co-crystals of enantiopure and racemic histidine with calcium halides. *CrystEngComm* **2017**, *19*, 6267-6273.
40. Braga, D.; **Degli Esposti, L.**; Rubini, K.; Shemchuk, O.; Grepioni, F. Ionic Cocrystals of Racemic and Enantiopure Histidine: An Intriguing Case of Homochiral Preference. *Cryst. Growth Des.* **2016**, *16*, 7263-7270.

AS BOOK CHAPTERS

1. **Degli Esposti, L.** Tailoring calcium phosphate nanoparticles for medical applications: a functional by design approach. *Doctoral Thesis* **2020**.
2. Setua, S.; Jaggi, M.; Yallapu, M.M.; Chauhan, S.C.; Danilushkina, A.; Lee, H.; Choi, I.S.; Fakhrullin, R.; **Degli Esposti, L.**; Tampieri, A. Targeted and theranostic applications for nanotechnologies in medicine. In *Nanotechnologies in Preventive and Regenerative Medicine*, Elsevier: 2018; pp. 399-511.
3. **Degli Esposti, L.**; Carella, F.; Iafisco, M. Inorganic nanoparticles for theranostic use. In *Electrofluidodynamic Technologies (EFDTs) for Biomaterials and Medical Devices*, Elsevier: 2018; pp. 351-376.

IN CONFERENCE PROCEEDINGS

1. Mancini, F., **Degli Esposti, L.**, Adamiano, A., Catalucci, D., Appleton, S., Vitali, A., Bugli, F., Sanguinetti, M., Iafisco, M., Calcium Phosphate Nanoparticles as Carriers of Therapeutic Peptides. *Solid State Phenomena*, **2022**, *339*, 89-94.
2. **Degli Esposti L.**, Carella, C., Adamiano A., Tampieri, A., Iafisco, M. CrystEngComm, Bio-Inspired Synthetic Strategies of Hydroxyapatite Nanocrystals: from Biomineralization to Regenerative Medicine and Drug Delivery. *Atti della Conferenza del Dipartimento Scienze Chimiche e Tecnologie dei Materiali - Alghero 19-20 ottobre 2017*, **2017**, 89.

PATENTS

1. Industrial Invention Patent. Title: "Composite material based on bioactive glass and amorphous calcium phosphate, and the process for producing the same" deposited by Consiglio Nazionale delle Ricerche and Friedrich-Alexander-Universität Erlangen-Nürnberg. Inventors: M. Iafisco (30%), **L. Degli Esposti (30%)**, K. Zheng (20%), A. R. Boccaccini (20%). Italian Patent Office ID: 102022000026496.