MARTA TAVONI

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La sottoscritta **MARTA TAVONI**, *consapevole che le dichiarazioni false comportano l'applicazione delle sanzioni penali previste dall'art.76 del D.P.R. 445/2000, dichiara che le informazioni riportate nel seguente curriculum vitae corrispondono a verità.In compliance with the Italian Legislative Decree no. 196 dated 30/06/2003, I hereby authorize the recipient of this document to use and process my personal details for the purpose of recruiting and selecting staff and I confirm to be informed of my rights in accordance to art. 7 of the above-mentioned decree*

Ph.D. in**Material Science and Technology** in 2024, University of Parma
M.Sc Degree in **Photochemistry and Molecular Materials** (LM-54) in 2018, University of Bologna
B.Sc Degree in **Chemistry and Material Chemistry** (L-27) in 2015, University of Bologna

CURRENT POSITION

Post-Doc Fellow Researcher at the **Institute of Science, Technology and Sustainability for Ceramics – National Research Council of Italy** (ISSMC-CNR, former ISTEC-CNR)
Headquarter: Via Granarolo 64, 48018, Faenza (RA), Italy
Website: https://www.issmc.cnr.it/

WORK EXPERIENCE

09/2024-PRESENT

Post-Doc Research fellow| ISSMC-CNR

Project title: ***"DINAMICA 2.0 - AVANZAMENTO TECNOLOGICO E VALIDAZIONE PRECLINICA DI BIOMATERIALIMEDICATI PER IL TRATTAMENTO E LA RIGENERAZIONE DEL TESSUTO OSSEO METASTATICO"*** *(CNR Call n°073.24.03.10)*.

The project aimed to validate the device developed in DINAMICA project (*POR-FESR 2014-2020 - PG/2018/632022*). In particular, the project will validate the bone cement and biomorphic devices functionalized with an anti-cancer drug for their bone tissue regenerative and anti-tumour capabilities. This will be done in both cellular and in vivo models, including those in chorion-allantoic membrane and in mouse models.
Funding: Project *"DINAMICA 2.0" (POR-FESR 2021-2027)*

12/2021-1/09/2024

Research fellow| ISSMC-CNR

Project title: ***"SVILUPPO DI IMPIANTI OSSEI BIOCERAMICI POROSI COME SISTEMI BIOATTIVI DI RILASCIO CONTROLLATO"*** *(CNR Call n°073.21.03.10)*

The project aimed to:

i) Develop bioactive and biomimetic calcium phosphate-based bioceramics scaffolds (injectable bone cement, macroporous sintered and biomorphic scaffolds) as drug-delivery system for regenerating bone tissue with metabolic dysfunction or disease (e.g., osteoporosis, bone tumors, bone infections...). In particular, scaffolds were functionalized with various drugs ranging from antimicrobial (tetracycline) to anti-tumoral (doxorubicin, methotrexate, and everolimus and denosumab), characterized by different physicochemical properties, such as hydrophilicity/hydrophobicity and size;
ii) Develop biomimetic ion-doped hydroxyapatite nanoparticles (e.g. magnesium, strontium, iron, silver and/or carbonate ions), from both natural and synthetic sources, functionalized with antibiotics and anticancer drugs as carriers for nanomedicine;

iii) Develop magnetic injectable bone cement, functionalized with antibiotics, by incorporating a novel bioactive superparamagnetic iron-doped hydroxyapatite into cement matrix for application in bone regeneration in dentistry;
iv) Studying the mechanisms that regulate drug loading and release from calcium phosphate powders, nanoparticles, and biomimetic and bioactive 3D scaffolds (bone cement, sintered scaffold, biomorphic scaffold), applying kinetic equations and semi-empirical mathematical models.

Funding: Internal CNR Project *MEFISTO: Sviluppo di impianti ossei bioceramici porosi come sistemi bioattivi di rilascio controllato.*

PARTICIPANT TO PROJECTS:

2024-today: Magnetic bone cement: Novel bioactive bone cements functionalized to tune cell fate and inhibit bacterial infections – *Progetto PNRR-MCNT2-2023-12377925*

2024-today: Development of new calcium phosphate-based implants with superparamagnetic properties and suitable injectability, self-hardening and cohesion for applications in odontostomatological surgery – *Scientific collaboration with Sapienza University of Rome*

2023-2024: CNR-IDEA GTO: Sviluppo di film biodegradabili da diversi tipi di biopolimeri con proprietà multifunzionali e antibatteriche per imballaggi intelligenti utilizzando un processo di estrusione e soffiaggio – *Progetto Bilaterale CNR-IDEA GTO (Stato di Guanajuato, Messico)* (CNR Protocol n° 264046 of 11/09/2023)

2021-2023: Antimicrobial drug-free apatites: development of antimicrobial drug-free apatite by developing a single phase nanocrystalline silver doped hydroxyapatite.

2021-2024: Catalytic apatites: The amphoteric nature of synthetic multi-ion doped hydroxyapatite and multi-ion doped hydroxyapatite derived from food waste for sustainable catalytic processes.

2021-2022: RE-GROWTH: Osteosarcoma and mesenchymal stem cells to assay innovative materials, bioactive injectable bone cements, with drug delivery ability, to contrast spine tumour recurrence and to enhance healthy bone regrowth – *Progetto Nazionale PRIN – 2017 C8RYSS* (CNR Protocol n° 0098797 of 03/04/2023).

2021-2022: BIOBOS: An in vitro and ex vivo model of biomimetic regenerative devices to treat bone metastases and soft tissue tumors–Progetto Nazionale finalizzato - GR-2016-02364704 (CNR Protocol n° 0024308 of 30/01/2023).

09/2023-10/2023

Visiting PhD student| Universitad Politecnica de la Catalunya (UPC)
Project title: ***"3D PRINTED ANTIMICROBIAL BONE CEMENT"***

The project aimed to develop 3D porous bone scaffolds with designed morphology and geometry and endowed with antimicrobial properties by micro-extruding inks made of pastes based on metastable CaP precursor able to self-harden and convert into hydroxyapatite when in contact with water. Particularly, the ink composition as well as the 3D printing parameters were optimized.

Funding: Grant from the European Ceramic Society–*ECerS* (contract number 2022 333).

12/2019-12/2021

Research Fellow| ISSMC-CNR

Project title: ***"DINAMICA: SVILUPPO E VALIDAZIONE DI BIOMATERIALI MEDICATI NANOSTRUTTURATI PER IL TRATTAMENTO E LA RIGENERAZIONE DEL TESSUTO OSSEO METASTATICO" –*** *(CNR Call n°073.19.03.11)*

The project aimed to develop and validate medicated biomimetic devices, including calcium-phosphate-based injectable pastes and implants derived from biomorphic transformation processes with unique structural properties. These devices have been functionalized with a bone resorption inhibitor molecule (denosumab) and an antitumor drug (everolimus), to obtain medicated implants for the regeneration of metastatic bone tissue. The drug loading approach to the cement matrix was optimized according to the chemistry of the drug. The drug release kinetics, the mechanism governing the drug release, as well as the biological performance, were evaluated.

Funding: Project *"DINAMICA" (POR-FESR 2014-2020 - PG/2018/632022)*

10/2017 – 03/2018

Internship for Master's degree thesis project | Alma Mater Studiorum – University of Bologna**,** carried out at the *NANOBIO INTERFACELAB*, under the supervision of Professor Matteo Calvaresi.
The thesis project aimed to design and developed third generation photosensitizer using hemoproteins as carrier, in order to preserve the photophysical and photochemical properties of dyes for applications in photodynamic therapy.

07/2015 – 12/2015

Internship for bachelor's degree thesis project | Alma Mater Studiorum – University of Bologna**,** carried out at the NanoBio InterfaceLab, under the supervision of Professor Giuseppe Falini and Professor Matteo Calvaresi.
The aim of the internship was to develop a calcium carbonate-based material capable of releasing fertilisers in a controlled manner, while optimising the cost/result ratio and, at the same time, reducing the amount of fertiliser administered.

MEMBERSHIP

Member of the **Italian Ceramic Society**, membership n° 1792
Member of **Società Italiana Biomateriali**, since 2021

TRAINING ACTIVITIES

Co-tutor of 2 M. Sc students, Department of Industrial Chemistry of Bologna University and Department of Molecular Biotechnology and Health Sciences of Torino University

EDUCATION

11/2020-11/2023

PhD XXXVI cycle| University of Parma
PhD in Materials Science and Technology
Carried out at ISSMC – CNR

Project title: ***"DEVELOPMENT OF BIOACTIVE CERAMICS AS DELIVERY SYSTEM FOR REGENERATIVE MEDICINE"***

09/2015–14/03/2018

Master's degree| Alma Mater Studiorum – University of Bologna
Master's Degree in Photochemistry and Molecular Materials (109/110)

Faenza 5/12/2025

DISSERTATION "*UTILIZZO DI APO-EMOPROTEINE COME CARRIER PER APPLICAZIONI IN TERAPIA FOTODINAMICA (Use of apo-hemoproteins as a carrier for application in photodynamic therapy)*".

09/2011–10/12/2015

Bachelor's degree | Alma Mater Studiorum – University of Bologna
Bachelor's degree in Chemistry and Materials Chemistry (99/110)
Curriculum: Materials Chemistry
DISSERTATION "*SISTEMI DI RILASCIO CONTROLLATO DI CHELATI DI FERRO PER APPLICAZIONI NANOTECNOLOGICHE IN AGRICOLTURA (Controlled release system for ironchelates for nanotechnologicalapplication in agriculture)*"

POST-GRADUATE ADVANCED TRAINING COURSES

09-11/10/2024	*SCHOOL OF NANOMEDICINE* - Florence, Italy Organizer: CNR-ICCOM, Sesto Fiorentino
21-23/02/2023	AIMED ECerS Winter School: *EMERGING ANTIMICROBIAL BIOMATERIALS FOR ORTHOPEDIC APPLICATIONS* -Zagreb, Croatia Organizer: European Ceramic Society
09-13/11/2020	*"ALDO ARMIGLIATO" SEM SCHOOL IN MATERIALS SCIENCE* Organizer: CNR-IMM, Bologna

PARTICIPATION IN NATIONAL OR INTERNATIONAL SCIENTIFIC CONFERENCES

8-10/07/2024 - Member of ***Organizing Committee*** and **Session Chair** of ***Annual Meeting of the Italian Society for Biomaterials* 2024**

30/11-2/12/2022 – Session Chair at **20th Young Researchers' Conference**, in the "*Biomaterial session*" **–** Belgrade

7-11/09/2025 — *34TH ANNUAL CONFERENCE OF THE EUROPEAN SOCIETY FOR BIOMATERIALS – TORINO ITALY*

- Oral presentation *Magnetic Bone Cement: new injectable biomaterials for bone regeneration.* M. Tavoni, H. Inam, A. Tampieri, E. Restivo, L. Visai, S. Sprio

9-11/10/2024 — *SCHOOL OF NANOMEDICINE - FLORENCE, ITALY*

- Poster presentation: *Injectable magnetic apatitic bone cement as tunable drug delivery systems for the treatment of bone tumors.* M. Tavoni, H. Inam, F. Pupilli, M. Dapporto, A. Tampieri, S. Sprio

8-10/07/2024 — *ANNUAL MEETING OF THE ITALIAN SOCIETY FOR BIOMATERIALS (SIB2024) – FAENZA – ITALY*

- Oral presentation as *invited speaker*: *Magnetic bone cement: new 4D injectable biomaterials for bone regeneration.* M. Tavoni, H. Inam, A. Tampieri, S.Sprio

4-8/09/2023 — 24TH ANNUAL CONFERENCE ON MATERIAL SCIENCE, YUCOMAT – HERCEG NOVI - MONTENEGRO

– Oral Presentation: *Strontium-doped apatitic scaffolds functionalized for sustained release of anticancer drugs against osteosarcoma.*M. Tavoni, M. Dapporto, A. Tampieri, S. Sprio, F. Martini, E. Mazzoni, M. Montesi.

2-6/07/2023 — CONFERENCE AND EXHIBITION OF THE EUROPEAN CERAMIC SOCIETY, ECerS LYON – FRANCE

– Oral Presentation: *Investigating the physicochemical and antibacterial properties of nanocrystalline hydroxyapatite co-doped with silver and carbonate*. M. Tavoni, M. Dapporto, A. Tampieri, E. Restivo, L. Visai, S. Sprio

22/02/2023 **EMERGING ANTIMICROBIAL BIOMATERIALS FOR ORTHOPAEDIC APPLICATIONS – ZAGREB - CROATIA**

– Poster Presentation: *Injectable strontium-doped apatitic bone cements with tunable antibacterial and antibiofilm ability*. M. Tavoni, M. Dapporto, E. Restivo, F. Carella, G. Bruni, L. Visai, A. Tampieri, M. Iafisco, S. Sprio

30/11-2/12/2022 **20TH YOUNG RESEARCHERS' CONFERENCE – BELGRADE -SERBIA**

– Oral Presentation: *Toward new therapies for the treatment of bone cancer: calcium phosphate-based cement as tuneable system for Doxorubicin delivery*.M. Tavoni, M. Dapporto, F. Carella, L. Mercatali, A. De Vita, M. Iafisco, A. Tampieri, S. Sprio

20-23/09/2022 ***INTERNATIONAL CONFERENCE: 32ND MEETING OF THE INTERNATIONAL SOCIETY OF CERAMICS IN MEDICINE, BIOCERAMICS32– VENEZIA MESTRE - ITALY***

– Poster Presentation: *New delivery systems made of self-hardening Calcium Phosphates functionalized with drug-loaded apatite nanoparticles*. M. Tavoni, M. Dapporto, F. Carella, L. Mercatali, A. De Vita, M. Iafisco, A. Tampieri, S. Sprio

– Poster Presentation: *Macroporous hydroxyapatite scaffolds modified for sustained drug delivery*. M. Tavoni, M. Dapporto, A. Tampieri, S. Sprio

5-9/09/2021 ***31ST CONFERENCE OF THE EUROPEAN SOCIETY FOR BIOMATERIALS (ESB2021) – PORTO - PORTUGAL***

– Poster Presentation: *Apatitic bone cements with effective antibacterial and antibiofilm effect*. M. Tavoni, M. Dapporto, F. Carella, E. Restivo, L. Visai, L. Mercatali, T. Ibrahim, A. Tampieri, M. Iafisco, S. Sprio

– Poster Presentation: *Doxorubicin-loaded hydroxyapatite nanoparticles as trigger for anticancer bone cement*. M. Tavoni, F. Carella, M. Dapporto, C. Cocchi, A. De Vita, A. Tampieri, M. Iafisco, S. Sprio

11-14/07/2021 ***CONGRESSO NAZIONALE BIOMATERIALI 2021 (SIB2021) – LECCE - ITALY***

– Oral Presentation: *Apatitic bone cements with effective drug release: from antibacterial and antibiofilm ability to anticancer therapy*. M. Tavoni, M. Dapporto, F. Carella, E. Restivo, L. Visai, L. Mercatali, T. Ibrahim, A. Tampieri, M. Iafisco, S. Sprio

– Poster Presentation: *Nanostructured medicated scaffolds for the local treatment of bone metastasis.* M. Tavoni, E. Campodoni, M. Dapporto, A. Ruffini, C. Cocchi, A. De Vita, T. Ibrahim, L. Mercatali, M. Sandri, S. Sprio, A. Tampieri, M. Montesi

AWARDS AND ACHIEVEMENT

23/02/2023

Best Poster presentation| AIMed Winter School **"EMERGING ANTIMICROBIAL BIOMATERIALS FOR ORTHOPAEDIC APPLICATIONS" – Zagreb - Croatia** (22-23/02/2023)

Title of presentation: *Injectable strontium-doped apatitic bone cements with tunable antibacterial and antibiofilm ability*. M. Tavoni, M. Dapporto, E. Restivo, F. Carella, G. Bruni, L. Visai, A. Tampieri, M. Iafisco, S. Sprio

14/02/2023

Mobility Grant| Sponsored by the **EUROPEAN CERAMIC SOCIETY**(*ECerS*)

30/11/2022

Best Oral presentation| 20th Young Researchers' Conference – Belgrade (30/11-2/12/2022)

Title of presentation: *Toward new therapies for the treatment of bone cancer: calcium phosphate-based cement as tunable system for Doxorubicin delivery*.M. Tavoni, M. Dapporto, F. Carella, L. Mercatali, A. De Vita, M. Iafisco, A. Tampieri, S. Sprio

SKILLS

Italian Native
English B2

Professional Skills

Analytical techniques/instruments: Fourier-Transformation Infrared Spectroscopy (FTIR), Dynamic Light Scattering (DLS, Z-potential), Scanning Electron Microscopy (SEM/ESEM)UV-Visible spectrophotometry, X-Ray Diffraction (XRD), Rietveld Analysis, Thermogravimetric analysis (TGA-DSC), Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES),Rheometer, Susceptometer.

ACTIVITIES

2024
Researcher Night | ISSMC-CNR
Scientific dissemination (CNR protocol n° 0356664 of 1/10/2024)

2023
Eligibility for researcher level III |
Call 400.2 PNRR ISSMC (CNR protocol n° 0116407 of 18/04/2023)
Call 400.1 PNRR ISSMC (CNR protocol n° 0118032 of 19/04/2023, n°0121185 of 21/04/2023)

2012 - 2014
Volunteering | Department of Chemistry "Giacomo Ciamician", Bologna
Scientific dissemination project: *Conoscere la chimica*

PUBLICATIONS

H-index: 7 (Google Scholar) **Citations:** 300 (Google Scholar)

1. Hina Inam, Simone Sprio, Federico Pupulli, Marta Tavoni, Anna Tampieri. "***POMEGRANATE AND CHERRY LEAF EXTRACTS AS STABILIZERS OF MAGNETIC HYDROXYAPATITE NANOCARRIERS FOR NUCLEIC ACID DELIVERY***" International Journal of Molecular Science (2025), 26, 23 https://doi.org/10.3390/ijms262311562
2. Hina Inam, Lorenzo Degli Esposti, Federico Pupulli, Tavoni Marta, Francesca Casoli, Simone Sprio, Anna Tampieri. "***IRON-DOPED HYDROXYAPATITE NANOPARTICLES FOR MAGNETIC GUIDED SIRNA DELIVERY***", International Journal of Molecular Science (2025), 26, 16, https://doi.org/10.3390/ijms26167712
3. Tampieri Anna, Tavoni Marta, Vicidomini Teresa, Inam Hina, Restivo Elisa, Visai Livia, Romeo Umberto, Sprio Simone. "***INJECTABLE BIOACTIVE SCAFFOLD ABLE TO STIMULATE ORAL BONE REGENERATION ON DEMAND***", Journal of Material Science: Materials in Medicine (2025) 36:31, https://link.springer.com/article/10.1007/s10856-025-06879-2
4. Campisi Sebastiano, Folliard Vincent, Tavoni Marta, Sprio Simone, Tampieri Anna, AuroxAline, Gervasini Antonella. "**UNVEILING THE EFFECTS OF ION SUBSTITUTIONS AND CARBONATION ON ACID/BASIC SURFACE FEATURES OF HYDROXYAPATITES**", Applied Surface Science 696 (2025) 162980, https://doi.org/10.1016/j.apsusc.2025.162980
5. Claudia Cocchi, Massimiliano Dapporto, AniaNalia Guerrieri, Claudia Liveriani, Marta Tavoni, Chiara Bellotti, Chiara Spadazzi, Anna Tampieri, Marco Gambarotti, Giacomo Miserocchi, Simone Sprio, Enrico Lucarelli, Michele Iafisco, Toni Ibrahim, Alessandro De Vita, Laura Mercatali. ***"A MODULAR BIOMIMETIC PRECLINICAL PLATFORM TO ELUCIDATE BONE AND***

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CANCER CELLS INTERACTION IN BONE METASTASIS", Journal of Functional Biomaterials 2025, 16(6), https://www.mdpi.com/2079-4983/16/6/220

6. Federico Pupilli, Marta Tavoni, Olivier Marsan, Christophe Drouet, Anna Tampieri, Simone Sprio "*TUNING MG DOPING AND FEATURES OF BONE-LIKE APATITE NANOPARTICLES OBTAINED VIA HYDROTHERMAL SYNTHESIS*", Langmuir 2024, 40, 16557-16570, 10.1021/acs.langmuir.4c02035
7. Federico Pupilli, Marta Tavoni, Christophe Druet, Anna Tampieri, Simone Spio. *"IRON-DOPED HYDROXYAPATITE BY HYDROTHERMAL SYNTHESIS: FACTORS MODULATING THE Fe^{2+}, Fe^{3+} CONTENT",* Open Ceramics, 18 (2024) 100610 doi:10.1016/j.oceram.2024.100610
8. Carmen Lanzillotti, Maria Rosa Iaquinta, Raffaella De Pace, Maria Mosaico, Simone Patergnani, Carlotta Giorgi, Marta Tavoni, Massimiliano Dapporto, Simone Sprio, Anna Tampieri, Monica Montesi, Fernanda Martini, Elisa Mazzoni. "*OSTEOSARCOMA CELL DEATH INDUCED BY INNOVATIVE SCAFFOLDS DOPED WITH CHEMOTHERAPEUTICS*", Journal of Cellular Physiology, Volume 239, Issue 5, e31256, doi: 10.1002/jcp.31256
9. Hina Inam, Simone Sprio, Marta Tavoni, Zahid Abbas, Federico Pupilli and Anna Tampieri. *"MAGNETIC HYDROXYAPATITE NANOPARTICLES IN REGENERATIVE MEDICINE AND NANOMEDICINE",* International Journal of Molecular Science 2024, 25 (5), 2809. doi: 10.3390/ijms25052809
10. Massimiliano Dapporto, Marta Tavoni, Elisa Restivo, Francesca Carella, Giovanna Bruni, Laura Mercatali, Livia Visai, Anna Tampieri, Michele Iafisco, and Simone Sprio*. "STRONTIUM-DOPED APATITIC BONE CEMENTS WITH TUNABLE ANTIBACTERIAL AND ANTIBIOFILM ABILITY."*Frontiers in Bioengineering and Biotechnology: 2297*,* doi: 10.3389/fbioe.2022.969641
11. Federico Pupilli, Andrea Ruffini, Massimiliano Dapporto, Marta Tavoni, Anna Tampieri, Simone Sprio *"DESIGN STRATEGIES AND BIOMIMETIC APPROACHES FOR CALCIUM PHOSPHATE SCAFFOLDS IN BONE TISSUE REGENERATION",* Biomimetics 2022, 7(3), 112; doi: 10.3390/biomimetics7030112
12. Marta Tavoni, Massimiliano Dapporto, Anna Tampieri, Simone Sprio **"***BIOACTIVE CALCIUM PHOSPHATE-BASED COMPOSITES FOR BONE REGENERATION***"** Journal of Composites Science, 2021, 5,227, doi: 10.3390/jcs509022
13. Matteo Di Giosia, Damiano Genovese, Andrea Cantelli, Matteo Cingolani, Enrico Rampazzo, Giulia Strever, Marta Tavoni, Nelsi Zaccheroni, Matteo Calvaresi and Luca Prodi **"***SYNTHESIS AND CHARACTERIZATION OF A RECONSTITUTED MYOGLOBIN-CHLORIN E6 ADDUCT FOR THERANOSTIC APPLICATIONS"* Journal of Porphyrins and Phthalocyanines, 2020, 24, 05n07, 887-893, doi: 10.1142/S108842461950202X
14. Elena Baldi, Grazia Marino, Enrico Muzzi, Claudio Marzadori, Claudio Ciavatta, Marta Tavoni, Matteo Di Giosia, Matteo Calvaresi, Giuseppe Falini, Francesco Zerbetto e Moreno Toselli **"***EFFECTIVENESS OF SYNTHETIC CALCITE DOPED WITH FE-EDDHSA AS A SLOW-RELEASE FE SOURCE: IN-VITRO EXPERIMENT ON KIWIFRUIT (ACTINIDIA CHINENSISVAR. DELICIOSA) PLANTS",* AIMS Agriculture and Food, 2019, 4(1): 127-135, doi:10.3934/agrfood.2019.1.127
15. Elena Baldi, Grazia Marino, Moreno Toselli, Claudio Marzadori, Claudio Ciavatta, Marta Tavoni, Matteo Di Giosia, Matteo Calvaresi, Giuseppe Falini, Francesco Zerbetto" *DELIVERY SYSTEM FOR AGRICULTURE: FE-EDDHSA/$CaCO_3$HYBRIDCRYSTAL AS ADJUVANT FOR PREVENTION OF IRONCHLOROSIS"*Chemical Communications 2018, 54, 1635-1638, doi: 10.1039/C7CC08215K