

## WORK EXPERIENCE

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October 2018 – September 2020

### Post-Doctoral Scholar

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia

Research activity in the Laboratory of Molecular Biology (University of Perugia) in the framework of the project "Enzyme treatment of the protein component of oilseed oilcake" (project FORTe-PSR Umbria 2014-2020).

October 2019 – Present

### Lecturer on the educational path "Tecnico Superiore per la Ricerca e lo Sviluppo di Prodotti e Processi a Base Tecnologica - Terni"

ITS Umbria Made in Italy – Innovazione, Tecnologia e Sviluppo, Via Palermo, 80a, 06124 Perugia

Teaching activity in "Instrumental Chemical Analysis".

July 2019 – August 2019

### Lecturer on the course "Corso di orientamento e preparazione ai Corsi di Laurea della Scuola di Medicina ad accesso programmato"

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia

Teaching activity in "Chemistry".

November 2016 – September 2018

### Post-Doctoral Scholar

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia

- Research activity in the Laboratory of Molecular Biology (University of Perugia) in the framework of the project "Hydrolysis of organic biomass and production of bio-based chemicals by enzymatic processes".

January 2018

### Lecturer on the postgraduate course "Esperto in Sistemi di Gestione Ambientale, Life Cycle Assessment e Carbon Footprint: Principles of Chemistry"

Confindustria Umbria, Via Palermo, 80a, 06124 Perugia

- Teaching activity in "Definitions, general concepts and rudiments of physics, chemistry and thermodynamics".

December 2014 – November 2016

### Post-Doctoral Scholar

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia

- Research activity in the Laboratory of Photochemistry and Photophysics (University of Perugia).
- Excited state intramolecular charge transfer dynamics in *push-pull* compounds: studies conducted in solution and organized media (micelles and hydrogels) by means of femtosecond transient absorption and fluorescence up-conversion spectroscopies.
- Spectroscopic investigation of heterogeneous photocatalysts for the production of hydrogen through water splitting.

## EDUCATION AND TRAINING

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July 2019

### Training Staff Mobility in the framework of the "ERASMUS + for staff training" project

University of Agronomic Sciences and Veterinary Medicine of Bucharest (USAMV), Bulevardul Mărăști 59, București 011464, Romania.

Partecipazione in the Summer School "Start up in Biotech".

November 2011 – November 2014

### Ph.D. in Chemical Sciences (XXVII cycle)

Level EQF: 8

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia.

- Thesis Title: INCLUSION OF TETRACYCLINE DRUGS IN MICELLES AND HYDROGELS AND THEIR CONTROLLED RELEASE. ULTRAFAST DYNAMICS AS A PROBE OF MICROHETEROGENEITY. Date of defence: 21 November 2014.
- Supervisor: Prof. Fausto Elisei.

November 2013 – May 2014

**Visiting Scholar at University of Pennsylvania, Philadelphia (USA)**

University of Pennsylvania, Philadelphia, PA 19104, Stati Uniti d'America.

- FTIR and time resolved 2D-IR spectroscopies for structural characterization of small organic molecules.

November 2011

**Licence to practise**

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia.

14 July 2011

**Master Degree in Chemical Sciences. Section: Physical-Chemistry Grade 110/110 with honours**

Level EQF : 7

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia.

- Thesis Title: SPECTROSCOPIC INVESTIGATION OF TETRACYCLINE-DIVALENT METAL ION COMPLEXES BY STATIONARY AND PULSED TECHNIQUES: PH AND STRUCTURE EFFECT .
- Supervisors: Prof. Fausto Elisei, Dr. Benedetta Carlotti.

15 October 2009

**Bachelor Degree in Chemistry. Section: General Chemistry Grade 110/110 with honours**

Level EQF : 6

Università degli Studi di Perugia, Piazza Università, 1, 06100 Perugia.

- Thesis Title: SPECTROSCOPY AND ULTRAFAST KINETICS OF DISTYRYL-FURANS: EFFECT OF THE SOLVENT ON THE DEACTIVATION DYNAMICS.
- Supervisors: Prof. Fausto Elisei, Dr. Benedetta Carlotti.

July 2006

**Scientific High School Diploma**

Level EQF : 4

**Grade: 100/100 comprehensive mark as a result of the partial scores achieved in the final examinations**

Liceo Scientifico Statale Galileo Galilei, via XIV Settembre, 79, 06122 Perugia.

## PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
First Certificate in English. Grade A					

 Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
 Common European Framework of Reference for Languages

Job-related skills

- Considerable experience of ultrafast spectroscopic techniques, laser alignment, data acquisition, data analysis and their interpretation.
- Good mentoring skills developed as research advisor for several undergraduate and graduate students and as teaching assistant for the "Physical Chemistry Lab" of the Chemistry undergraduate program of the University of Perugia.
- Experience of biochemistry and molecular and cellular biology techniques: purification of proteins by means of ion-exchange chromatography, Bradford protein assay, lysosomal enzyme assay through spectrofluorimetric and spectrophotometric analysis; protein extraction purification and quantification from cell pellets, SDS page and Western Blot techniques; preparation of cell culture medium and cell line expansion.

- Computer skills**
- Great knowledge of Windows OS and Microsoft Office™ tools.
  - Good command of dedicated programs for data analysis, such as Surface Explorer Pro, Glotaran and OriginLab®.
- Driving licence**
- B

## ADDITIONAL INFORMATION

Total number of publications in international journals: **33** (13 as first author; 9 as corresponding author)  
 h-index: **10** (according to Scopus)  
 Total citations: **413** (according to Scopus)

- Publications**
- Calzoni, E.; Cesaretti, A.; Montegiove, N.; Di Michele, A.; Emiliani, C. Enhanced Stability of Long-Living Immobilized Recombinant  $\beta$ -dN-Acetyl-Hexosaminidase A on Polylactic Acid (PLA) Films for Potential Biomedical Applications. *J Funct Biomater*, 2021, 12(2), 32.
- Tiecco, M.; Di Guida, I.; Gentili, P.L.; Germani, R.; Bonaccorso, C.; Cesaretti, A. Probing the structural features and the micro-heterogeneity of various deep eutectic solvents and their water dilutions by the photophysical behaviour of two fluorophores, *J. Mol. Liq.*, 2021, 331, 115718.
- Valora, G.; Bonaccorso, C.; Cesaretti, A.; Fortuna, C.G.; Spalletti, A.; Elisei, F. Metal complexes with sterically demanding phenanthroline ligands: A combined spectroscopic study, *Dyes and Pigments*, 2021, 187, 109150.
- Calzoni, E.; Cesaretti, A.; Tacchi, S.; Caponi, S.; Pellegrino, R.M.; Luzi, F.; Cottone, F.; Fioretto, D.; Emiliani, C.; Di Michele, A. Covalent immobilization of proteases on polylactic acid for proteins hydrolysis and waste biomass protein content valorization, *Catalysts*, 2021, 11(2), 1–18.
- Mencaroni, L.; Carlotti, B.; Cesaretti, A.; Elisei, F.; Grgičević, A.; Škorić, I.; Spalletti, A. Competition between fluorescence and triplet production ruled by nitro groups in one-arm and two-arm styrylbenzene heteroanalogues, *Photochem. Photobiol. Sci.*, 2020, 19(12), 1665–1676.
- Rout, Y.; Cesaretti, A.; Ferraguzzi, E.; Carlotti, B.; Misra, R. Multiple Intramolecular Charge Transfers in Multimodular Donor-Acceptor Chromophores with Large Two-Photon Absorption, *J. Phys. Chem. C*, 2020, 124(45), 24631–24643
- Poddar, M.; Cesaretti, A.; Ferraguzzi, E.; Carlotti, B.; Misra, R. Singlet and Triplet Excited-State Dynamics of 3,7-Bis(arylethynyl)phenothiazines: Intramolecular Charge Transfer and Reverse Intersystem Crossing, *J. Phys. Chem. C*, 2020, 124(33), 17864–17878
- Cesaretti, A.; Foggi, P.; Fortuna, C.G.; Elisei, F.; Spalletti, A.; Carlotti, B. Uncovering Structure-Property Relationships in Push-Pull Chromophores: A Promising Route to Large Hyperpolarizability and Two-Photon Absorption, *J. Phys. Chem. C*, 2020, 124(29), 15739–15748.
- Botti, V.; Urbanelli, L.; Sagini, K.; Tarpani, L.; Cesaretti, A.; Fortuna, C.; Elisei, F. Quaternized Styryl-Azinium Fluorophores: Potential Anticancer Drugs as RNA-Binders, *Photochem. Photobiol. Sci.*, 2020, 19(3), 362–370.
- Carlotti, B.; Cesaretti, A.; Cacioppa, G.; Elisei, F.; Odak, I.; Škorić, I.; Spalletti, A. Fluorosolvatochromism and hyperpolarizability of one-arm and two-arms nitro-compounds bearing heterocyclic rings, *J. Photochem. Photobiol. A*, 2019, 368, 190-199.
- Botti, V.; Cesaretti, A.; Ban, Z.; Crnolatac, I.; Consiglio, G.; Elisei, F.; Piantanida, I. Fine structural tuning of styryl-based dyes for fluorescence and CD-based sensing of various ds-DNA/RNA sequences, *Org. Biomol. Chem.*, 17(35), 8243-8258.
- Cesaretti, A.; Carlotti, B.; Elisei, F.; Spalletti, A. Effect of the size of polycyclic aryl groups on the competition between adiabatic/diabatic photoisomerization mechanisms of cis-styrylarenes, *Photochem. Photobiol. Sci.*, 2019, 18(9), 2125-2135.

Calzoni, E.; Cesaretti, A.; Polchi, A.; Di Michele, A.; Tancini, B.; Emiliani, C. Biocompatible Polymer Nanoparticles for Drug Delivery Applications in Cancer and Neurodegenerative Disorder Therapies, *J Funct Biomater*, 2018, 10(1), 4.

Cesaretti, A.; Di Guida, I.; Caldero Rodriguez, N.; Clementi, C.; Germani, R.; Fortuna, C.; Gentili, P. L. Mimicking the secretory action of a gland by a composite system made of a pH-responsive surfactant-based hydrogel and a dialysis membrane, *ACS Omega*, 2018, 16777-16783.

Cesaretti, A.; Bonaccorso, C.; Carboni, V.; Giubila, M. S.; Fortuna, C.; Elisei, F.; Spalletti, A. Four styryl phenanthroline derivatives as excellent acidochromic probes, *Dyes and Pigments*, 2018, 440-450.

Cesaretti, A.; Bonaccorso, C.; Elisei, F.; Fortuna, C. G.; Mencaroni, L.; Spalletti, A.; Photoinduced Intramolecular Charge Transfer and Hyperpolarizability Coefficient in Push-Pull Pyridinium Salts with Increasing Strength of the Acceptor Group, *ChemPlusChem*, 2018, 1021-1031.

Bonaccorso, C.; Cesaretti, A.; Elisei, F.; Mencaroni, L.; Spalletti, A.; Fortuna, C. "New Styryl Phenanthroline Derivatives as Model D- $\pi$ -A- $\pi$ -D Materials for Non-Linear Optics", *ChemPhysChem*, 2018, 1917-1929.

Carlotti, B.; Cesaretti, A.; Cannelli, O.; Giovannini, T.; Cappelli, C.; Bonaccorso, C.; Fortuna, C.; Elisei, F.; Spalletti, A. Evaluation of Hyperpolarizability from the Solvatochromic Method: Thiophene Containing Push-Pull Cationic Dyes as a Case Study, *J. Phys. Chem. C*, 2018, 2285-2296.

Cesaretti, A.; Carlotti, B.; Elisei, F.; Fortuna, C. G.; Spalletti, A. Photoinduced ICT vs Excited Rotamer Intercrossover in two quadrupolar polyaromatic N-methylpyridinium cations, *Phys. Chem. Chem. Phys.*, 2018, 2851-2864.

Cesaretti, A.; Carlotti, B.; Elisei, F.; Fortuna, C. G.; Consiglio, G.; Spalletti, A. A cationic naphthyl derivative defies the Non Equilibrated Excited Rotamers principle. *Phys. Chem. Chem. Phys.*, 2017, 19, 5262-5272

Carlotti, B.; Cesaretti, A.; Gentili, P. L.; Marrocchi, A.; Elisei, F.; Spalletti, A. A Two Excited State Model to Explain the Peculiar Photobehaviour of a Flexible Quadrupolar D- $\pi$ -D Anthracene Derivative. *Phys. Chem. Chem. Phys.*, 2016, 18, 23389-23399.

Cesaretti, A.; Carlotti, B.; Gentili, P. L.; Germani, R.; Fortuna, C.; Spalletti, A.; Elisei, F. Twisting in the Excited State of a N-Methylpyridinium Fluorescent Dye Modulated by Nano-Heterogenous Micellar Systems. *Photochem. Photobiol. Sci.*, 2016, 15, 525-535.

Penconi, M.; Cesaretti, A.; Ortica, F.; Elisei, F.; Gentili, P. L. Photoluminescence Properties of  $\text{La}_{2x}\text{Ga}_{2y}\text{In}_{2z}\text{O}_3$  Solid Solutions Used as Photocatalysts for Water Splitting and Promising Panchromatic Emitters. *J. Lumin.*, 2016, 177, 314-324.

Clementi, C.; Cesaretti, A.; Carlotti, B.; Elisei, F. The Role of pH in Modulating the Electronic State Properties of Minocycline Drug and Its Inclusion within Micellar Carriers. *J. Phys. Chem. A*, 2016, 120, 4994-5005.

Carlotti, B.; Benassi, E.; Cesaretti, A.; Fortuna, C.; Spalletti, A.; Barone, V.; Elisei, F. Ultrafast Spectroscopic and Density Functional Theoretical Investigation of Multiple Emissions in Push-Pull Pyridinium Derivatives Bearing Different Electron Donors. *Phys. Chem. Chem. Phys.*, 2015, 17, 20981-20989.

Cesaretti, A.; Carlotti, B.; Germani, R.; Spalletti, A.; Elisei, F. Inclusion of Push-Pull N-Methylpyridinium Salts within Surfactant Hydrogels: Is Their Excited State Intramolecular Charge Transfer Mediated by Twisting? *Phys. Chem. Chem. Phys.*, 2015, 17, 17214-17220.

Cesaretti, A.; Carlotti, B.; Consiglio, G.; Del Giacco, T.; Spalletti, A.; Elisei, F. Inclusion of Two Push-Pull N-Methylpyridinium Salts in Anionic Surfactant Solutions: a Comprehensive Photophysical Investigation. *J. Phys. Chem. B*, 2015, 119, 6658-6667.

Benassi, E.; Carlotti, B.; Segado Centellas, M.; Cesaretti, A.; Spalletti, A.; Elisei, F.; Barone, V. Presence of Two Emissive Minima in the Lowest Excited State of a Push-Pull Cationic Dye

Unequivocally Proved by Femtosecond Up-Conversion Spectroscopy and Vibronic Quantum-Mechanical Computations. *J. Phys. Chem. B*, 2015, 119,6035-6040.

Carlotti, B.; Cesaretti, A.; Fortuna, C. G.; Spalletti, A.; Elisei, F. Experimental evidence of dual emission in a negatively solvatochromic push-pull pyridinium derivative. *Physical Chemistry Chemical Physics*, *Phys. Chem. Chem. Phys.*, 2015, 17, 1877-1882.

Cesaretti, A.; Carlotti, B.; Gentili, P. L.; Clementi, C.; Germani, R.; Elisei, F. Doxycycline and oxytetracycline loading of a zwitterionic amphoteric surfactant-gel and their controlled release. *Phys. Chem. Chem. Phys.*, 2014, 16, 23096-23107.

Cesaretti, A.; Carlotti, B.; Gentili, P. L.; Clementi, C.; Germani, R.; Elisei, F. Spectroscopic Investigation of the pH Controlled Inclusion of Doxycycline and Oxytetracycline Antibiotics in Cationic Micelles and their Magnesium Driven Release. *J. Phys. Chem. B*, 2014, 118, 8601-8613.

Cesaretti, A.; Carlotti, B.; Clementi, C.; Germani, R.; Elisei, F. Effect of Micellar and Sol-Gel Media on the Spectral and Kinetic Properties of Tetracycline and its Complexes with  $Mg^{2+}$ . *Photochem. Photobiol. Sci.*, 2014, 13, 509-520.

Carlotti, B.; Cesaretti, A.; Elisei, F. Complexes of Tetracyclines with Divalent Metal Cations Investigated by Stationary and Femtosecond-Pulsed Techniques. *Phys. Chem. Chem. Phys.*, 2012, 14, 823-834.

**Chapters** Calzoni, E.; Argentati, C.; Cesaretti, A.; Montegiove, N.; Tortorella, I.; Bazzucchi, M.; Morena, F.; Martino, S.; Emiliani, C. RNA Modifications in Neurodegenerations, in: *Epitranscriptomics*. Springer Nature, *under press*, 2021.

Calzoni, E.; Cesaretti, A.; Emiliani, C. Creating Products and Services in Industrial Biotechnology, in: Matei F., Zirra D. (eds) *Introduction to Biotech Entrepreneurship: From Idea to Business*. Springer, Cham, 2019, 129-139

**Patents** Emiliani, C.; Calzoni, E.; Cesaretti, A.; Di Michele, A.; Fioretto, D.; Cottone, F.; Caponi, S.; Tacchi, S. PROTEASI IMMOBILIZZATE SU MATRICI DI ACIDO POLILATTICO COME SISTEMA BIOCATALITICO PER LA DEGRADAZIONE DI BIOMASSE. Italian Patent, Protocol No. 102019000025012, *pending*, 2019.

Emiliani, C.; Calzoni, E.; Cesaretti, A.; Di Michele, A.; Fioretto, D.; Cottone, F.; ENZIMA  $\beta$ -D-N-ACETILESOSAMINIDASI A IMMOBILIZZATO SU FILM E NANOPARTICELLE DI ACIDO POLILATTICO (PLA) PER APPLICAZIONI MEDICHE NEL CAMPO DELLA TERAPIA ENZIMATICA SOSTITUTIVA DELLE MALATTIE DI TAY-SACHS E SANDHOFF. Italian Patent, Protocol No. 102020000003344, *pending*, 2019.

**Conferences** **Poster Presentations**

WINTER SCHOOL IN BIOTECHNOLOGIES 202. Perugia, Italy.  
"Photophysical characterization and non-linear optical (NLO) properties of organic bi-cationic push-pull compounds". January 2021

UK-IT JOINT MEETING ON PHOTOCHEMISTRY 2019. Lipari, Italy.  
"Enlightening the interactions between N-methylpyridinium- and N-methylquinolinium-derivatives, and nucleic acids". June 2019.

METAORGANISMS, MICROBIAL BIOREFINERIES and HUMAN HEALTH. Bologna, Italy.  
"The long life of immobilized  $\beta$ -D-N-acetyl hexosaminidase A for developing an improved ERT". June 2018.

THIRD GENERATION BIOREFINERIES. Bologna, Italy.  
"Immobilized Enzymes for the degradation of agribusiness and food industry biomasses". March 2017.

CENTRAL EUROPEAN CONFERENCE ON PHOTOCHEMISTRY. Bad Hofgastein, Austria.  
"Multiple emissions in push-pull cationic dyes". February 2016.

FEMTO12 (The Hamburg Conference on Femtochemistry). Hamburg, Germany.  
"Inclusion of Some Push-Pull N-Methylpyridinium Salts within Surfactant Solutions: Is Their Excited State Intramolecular Charge Transfer Mediated by Twisting?". July 2015.

FEMTO12 (The Hamburg Conference on Femtochemistry). Hamburg, Germany.  
"Multiple Emissions in Push-Pull Cationic Dyes". July 2015.

IUPAC XXV (Symposium on Photochemistry). Bordeaux, France.  
"Spectroscopic Investigation of the pH-dependent Inclusion of Some Tetracyclines in Micellar and Hydro-gel Media". July 2014.

INTERNATIONAL CONFERENCE ON PHOTOCHEMISTRY. Leuven, Belgium.  
"Effect of micellar and sol-gel media on the spectral and kinetic properties of tetracyclines and their complexes with divalent cations". July 2013.

Frontiers in Photochemistry. Les Diablaerts, Switzerland.  
"Effect of Micellar and Sol-Gel media on the Spectral and Kinetic Properties of Tetracyclines and their Complexes with Divalent Cations". August 2013.

#### Seminars

IPM (Italian Photochemistry Meeting) 2017. Perugia, Italy.  
"The many uses of some push-pull phenanthroline-derivatives: NLO materials, acid-base indicators and sensors for metal cations". December 2017.

1<sup>ST</sup> EUROPEAN CONFERENCE ON PHYSICAL AND THEORETICAL CHEMISTRY. Catania, Italy.  
"Multiple emissions of methylpyridinium cations investigated by ultrafast spectroscopy and DFT calculations". September 2015.

IPM (Italian Photochemistry Meeting) 2012. Bologna, Italy.  
"Spectroscopic Characterization of pH-dependent Complexes of Tetracyclines with Divalent Metal Cations in Aqueous, Micellar and Sol-Gel Media". October 2012.

#### Teaching-related experiences

- Research advisor of several bachelor and master students;
- Teaching Assistant for the "Physical Chemistry Lab" of the degree in Chemistry of the University of Perugia;
- Occasional lecturer of "Femtochemistry" for the master degree in Chemistry of the University of Perugia;
- Occasional lecturer of "Photochemistry" for the master degree in Chemistry of the University of Perugia.

## References

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