

## **DOTT. MICHELA SALAMONE**

### **CURRICULUM VITAE ET STUDIORUM (italiano)**

#### **Studi e formazione professionale**

Luglio 1992: Diploma di maturità classica presso il “Liceo-ginnasio statale Giulio Cesare” di Roma con la votazione di 60/60.

Luglio 1999: Laurea in Chimica, Università degli Studi di Roma "La Sapienza". Voto: 110/110 e lode. Titolo della tesi di Laurea: "Sintesi di nuovi macrocicli bimetallici. Verso l'attivazione bifunzionale in sistemi metallocarbonilici". Relatori: Prof. Bernardo Masci, Dott. Mauro Bassetti.

Gennaio 2000: Abilitazione all'esercizio della professione di chimico.

1999-2002: Dottorato di Ricerca in Scienze Chimiche (XV ciclo), Università di Roma "Tor Vergata". Titolo della tesi di Dottorato: "Mechanistic aspects of the reactivity of radical intermediates involved in the oxidative degradation of simple lignin model compounds. The role of structural effects on the side-chain fragmentation of alkoxy radicals and arylalkanol radical cations". Supervisore: Prof. Massimo Bietti.

Marzo 2003: E' risultata vincitrice del concorso per titoli e colloquio per un Assegno di Ricerca biennale presso il Dipartimento di Scienze e Tecnologie Chimiche, Università degli Studi di Roma "Tor Vergata", Settore Scientifico Disciplinare: CHIM/06 Chimica Organica, che ha svolto nel periodo Marzo 2003-Settembre 2005 (interruzione per maternità) sotto la supervisione del Prof. Massimo Bietti e del Prof. Gianfranco Ercolani.

Settembre 2005: E' risultata vincitrice del concorso per titoli e colloquio per un Assegno di Ricerca annuale presso il Dipartimento di Scienze e Tecnologie Chimiche, Università degli Studi di Roma "Tor Vergata", Settore Scientifico Disciplinare: CHIM/06 Chimica Organica che ha svolto nel periodo Settembre 2005- Giugno 2007 (interruzione per maternità) sotto la supervisione del Prof. Massimo Bietti.

Luglio 2007: E' risultata vincitrice della procedura di valutazione comparativa ad un posto di ricercatore universitario per il settore scientifico-disciplinare CHIM/06 CHIMICA ORGANICA presso la Facoltà di Scienze MM.FF.NN. dell'Università di Roma "Tor Vergata".

Novembre 2007: Ha preso servizio come Ricercatore Universitario presso la Facoltà di Scienze Matematiche Fisiche e Naturali dell'Università degli Studi di Roma "Tor Vergata", Settore Scientifico Disciplinare: CHIM/06 Chimica Organica.

#### Attività di ricerca all'estero

Ha effettuato periodi di ricerca all'estero presso il "Max-Planck-Institut für Strahlenchemie", Mülheim an der Ruhr (Germania), nel gruppo del Prof. Steen Steenken; presso il "Central Laser Facility - Rutherford Appleton Laboratory", Didcot (Regno Unito), nell'ambito dell'European Commission Access to Large-Scale Facilities Scheme e presso il "Daresbury Laboratory, Free Radical Research Facility", Daresbury (Regno Unito), nell'ambito dell'European Commission's Transnational Access to Major Research Infrastructures.

La sua attività scientifica riguarda lo studio di intermedi reattivi quali radicali liberi e radicali ioni in chimica organica mediante l'impiego di tecniche risolte nel tempo quali la laser flash fotolisi.

E' autore e coautore di 34 pubblicazioni su riviste e periodici internazionali e di 20 comunicazioni (orali o poster) a Congressi Nazionali ed Internazionali.

## CURRICULUM VITAE ET STUDIORUM (inglese)

Michela Salamone was born in Rome in 1974. She studied Chemistry at the University "La Sapienza" of Rome, where she obtained her Laurea degree in 1999 under the supervision of Dr. Mauro Bassetti working on the synthesis and characterization of novel heteroditopic macrocyclic systems. She obtained her PhD in chemistry in 2003 at the University of Rome "Tor Vergata" under the supervision of Prof. Massimo Bietti with a thesis work on the "Mechanistic aspects of the reactivity of radical intermediates involved in the oxidative degradation of simple lignin model compounds. The role of structural effects on the side-chain fragmentation of alkoxy radicals and arylalkanol radical cations". During this period she carried out research activity in the Max Planck Institut für Strahlenchemie, Mülheim an der Ruhr (Germany) and Daresbury Laboratory and Rutherford Appleton Laboratory (United Kingdom). She has been a postdoctoral fellow in the period 2003-2007 at the Dipartimento di Scienze e Tecnologie Chimiche of the Università di Roma "Tor Vergata", where she became Research Associate in Organic Chemistry in November 2007. She gave theoretical and practical assistance to the courses of Organic Chemistry since 2001 and now she teaches the course of Organic Chemistry for Biology students. She has supervised the research activity of PhD students and undergraduated students. Her scientific activity is focused on the study of reactive intermediates such as radical ions and free radicals in organic chemistry by means of steady state photolysis and time resolved techniques such as laser flash photolysis. The results of this work led to 34 publications in international journals.

### Elenco Pubblicazioni

- P1.** E. Baciocchi, M. Bietti, M. F. Gerini, L. Manduchi, M. Salamone, S. Steenken, "Structural effects on the OH-Promoted Fragmentation of Methoxy-Substituted 1-Arylalkanol Radical Cations in aqueous solution: The Role of Oxygen Acidity" *Chem. Eur. J.* **2001**, 7, 1408-1416.
- P2.** E. Baciocchi, M. Bietti, M. Salamone, S. Steenken, "Spectral Properties and Absolute Rate Constants for the  $\beta$ -Scission of Ring Substituted Cumyloxyl Radicals. A Laser Flash Photolysis Study" *J. Org. Chem.* **2002**, 67, 2266-2270.
- P3.** M. Bellanova, M. Bietti, G. Ercolani, M. Salamone, "The role of stereoelectronic effects on the side-chain fragmentation of alkylaromatic radical cations. The reactivity of 5-methoxy-2,2-dimethylindan-1-ol radical cation" *Tetrahedron* **2002**, 58, 5039-5044.
- P4.** M. Bassetti, A. Capone, L. Mastrofrancesco, M. Salamone, "Oxidative Addition of Methyl Iodide and CO Migratory Insertion in a Cationic Rhodium Complex of a S, N, S Tridentate Ligand" *Organometallics* **2003**, 22, 2535-2538.
- P5.** M. Bellanova, M. Bietti, M. Salamone, "The role of oxygen acidity on the side-chain fragmentation of ring methoxylated benzocycloalkenol radical cations" *Tetrahedron Letters*, **2003**, 44, 6401-6404.
- P6.** M. Bassetti, A. Capone, M. Salamone, "Kinetic Evidence of an Arm-Off Mechanism in Complexes of Hemilabile Hybrid Ligands. Oxidative Addition of Methyl Iodide to the Rhodium (I) Complex [Rh(2,6-bis(benzylthiomethyl)pyridine)(CO)]PF<sub>6</sub> via Competitive Pathways" *Organometallics* **2004**, 23, 247-252.

- P7.** C. S. Aureliano Antunes, M. Bietti, M. Salamone, N. Scione, "Early stages in the TiO<sub>2</sub>-photocatalyzed degradation of simple phenolic and non-phenolic lignin model compounds" *J. Photochem. Photobiol., A: Chem.* **2004**, *163*, 453-462.
- P8.** C. S. Aureliano Antunes, M. Bietti, O. Lanzalunga, M. Salamone, "Photolysis of 1-Alkylcycloalkanols in the Presence of (Diacetoxyiodo)benzene and I<sub>2</sub>. Intramolecular Selectivity in the  $\beta$ -Scission Reactions of the Intermediate 1-Alkylcycloalkoxyl Radicals" *J. Org. Chem.* **2004**, *69*, 5281-5289.
- P9.** M. Bietti, O. Lanzalunga, M. Salamone, "Structural Effects on the  $\beta$ -Scission Reaction of Alkoxy Radicals. Direct Measurement of the Absolute Rate Constants for Ring Opening of Benzocycloalken-1-oxyl Radicals" *J. Org. Chem.* **2005**, *70*, 1417-1422.
- P10.** Carla S. Aureliano Antunes, M. Bietti, O. Lanzalunga, M. Salamone, "The Effect of Ring Substitution on the *O*-Neophyl Rearrangement of 1,1-Diaryloxy Radicals. A Product and Time-Resolved Kinetic Study" *J. Org. Chem.*, **2005**, *70*, 3884-3891.
- P11.** M. Bietti, G. Gente, M. Salamone, "Structural Effects on the  $\beta$ -Scission Reaction of Tertiary Arylcarbinoyloxy Radicals. The Role of  $\alpha$ -Cyclopropyl and  $\alpha$ -Cyclobutyl Groups" *J. Org. Chem.*, **2005**, *70*, 6820-6826.
- P12.** M. Bietti, M. Salamone, "Solvent Effects on the *O*-Neophyl Rearrangement of 1,1-Diaryloxy Radicals. A Laser Flash Photolysis Study" *J. Org. Chem.*, **2005**, *70*, 10603-10606.
- P13.** M. Bassetti, A. Calenne, L. Mastrofrancesco, M. Salamone, G. Bocelli, A. Cantoni, A. Musatti, "Synthesis and Characterization of a Novel Heteroditopic Macrocyclic System. Monometallic Nickel(II) and Uranyl Complexes and Corresponding Heterobimetallic Rhodium(I)-Carbonyl Complexes." *Eur. J. Inorg. Chem.*, **2006**, 914-925.
- P14.** M. Bietti, O. Lanzalunga, M. Salamone, "Involvement of Alkoxy Radical Intermediates in the Photolysis of 1-Alkylcycloalkanols in the Presence of Bis(pyridine)iodonium Tetrafluoroborate. Comparison with the (Diacetoxyiodo)benzene/I<sub>2</sub> System", *J. Photochem. Photobiol., A: Chem.*, **2006**, *182*, 33-37.
- P15.** M. Bietti, S. Fiorentini, I. Perez Pato, M. Salamone, "Oxygen Acidity of Ring Methoxylated 1,1-Diaryloxy Radical Cations Bearing  $\alpha$ -Cyclopropyl Groups. The Competition between *O*-Neophyl Shift and C-Cyclopropyl  $\beta$ -Scission in the Intermediate 1,1-Diaryloxy Radicals", *J. Org. Chem.*, **2006**, *71*, 3167-3175.
- P16.** M. Bietti, G. Ercolani, M. Salamone, "DFT Evidence for a Stepwise Mechanism in the *O*-Neophyl Rearrangement of 1,1-Diaryloxy Radicals", *J. Org. Chem.*, **2007**, *72*, 4515-4519
- P17.** M. Salamone, M. Bietti, A. Calcagni, G. Gente, "Phenyl Bridging in Ring-Substituted Cumyloxy Radicals. A Product and Time-Resolved Kinetic Study", *Org. Lett.*, **2009**, *11*, 2453-2456
- P18.** M. Bietti, A. Calcagni, D. O. Cicero, R. Martella, M. Salamone, "The *O*-neophyl rearrangement of 1,1-diaryloxy radicals. Experimental evidence for the formation of an intermediate 1-oxaspiro[2,5]octadienyl radical", *Tetrahedron Letters*, **2010**, *51*, 4129-4131.
- P19.** M. Bietti, A. Calcagni, M. Salamone, "The Role of Structural Effects on the Reactions of Alkoxy Radicals with Trialkyl and Triaryl Phosphites. A Time-Resolved Kinetic Study", *J. Org. Chem.*, **2010**, *75*, 4514-4520.

- P20.** M. Bietti, M. Salamone, “Kinetic Solvent Effects on Hydrogen Abstraction Reactions from Carbon by the Cumyloxyl Radical. The Role of Hydrogen Bonding”, *Org. Lett.*, **2010**, *12*, 3654-3657.
- P21.** M. Bietti, G. A. DiLabio, O. Lanzalunga, M. Salamone, “Electron Transfer Properties of Alkoxy Radicals. A Time-Resolved Kinetic Study of the Reactions of the *tert*-Butoxyl, Cumyloxyl, and Benzyloxyl Radicals with Alkyl Ferrocenes”, *J. Org. Chem.*, **2010**, *75*, 5875-5881.
- P22.** M. Salamone, G. Anastasi, M. Bietti, G. A. DiLabio, “Diffusion Controlled Hydrogen Atom Abstraction from Tertiary Amines by the Benzyloxyl Radical. The Importance of C-H/N Hydrogen Bonding”, *Org. Lett.*, **2011**, *13*, 260-263.
- P23.** M. Bietti, G. A. DiLabio, O. Lanzalunga, M. Salamone, “Time-Resolved Kinetic Study of the Electron-Transfer Reactions between Ring-Substituted Cumyloxyl Radicals and Alkylferrocenes. Evidence for an Inner-Sphere Mechanism”, *J. Org. Chem.*, **2011**, *76*, 1789-1794.
- P24.** M. Salamone, I. Giammarioli, M. Bietti, “Kinetic Solvent Effects on Hydrogen Abstraction Reactions from Carbon by the Cumyloxyl Radical. The Importance of Solvent Hydrogen-Bond Interactions with the Substrate and the Abstracting Radical”, *J. Org. Chem.*, **2011**, *76*, 4645-4651.
- P25.** E. Baciocchi, M. Bietti, C. D’Alfonso, O. Lanzalunga, A. Lapi, M. Salamone, “One-electron oxidation of ferrocenes by short-lived *N*-oxyl radicals. The role of structural effects on the intrinsic electron transfer reactivities”, *Org. Biomol. Chem.*, **2011**, *9*, 4085-4090.
- P26.** M. Salamone, G. A. DiLabio, M. Bietti, “Hydrogen Atom Abstraction Reactions from Tertiary Amines by the Benzyloxyl and Cumyloxyl Radicals. The Influence of Structure on the Rate-Determining Formation of a Hydrogen Bonded Pre-reaction Complex”, *J. Org. Chem.*, **2011**, *76*, 6264-6270.
- P27.** M. Salamone, G. A. DiLabio, M. Bietti, “Hydrogen Atom Abstraction Selectivity in the Reactions of Alkylamines with the Benzyloxyl and Cumyloxyl Radicals. The Importance of Structure and of Substrate Radical Hydrogen Bonding”, *J. Am. Chem. Soc.*, **2011**, *133*, 16625-16634.
- P28.** M. Bietti, R. Martella, M. Salamone, “Understanding Kinetic Solvent Effects on Hydrogen Abstraction Reactions from Carbon by the Cumyloxyl Radical”, *Org. Lett.*, **2011**, *13*, 6110-6113.
- P29.** M. Bietti, M. Salamone, G. A. DiLabio, S. Jockusch, N. J. Turro, “Kinetic Solvent Effects on Hydrogen Abstraction from Phenol by the Cumyloxyl Radical. Toward an Understanding of the Role of Protic Solvents”. *J. Org. Chem.*, **2012**, *77*, 1267-1272.
- P30.** M. Salamone, R. Martella, M. Bietti, “Hydrogen Abstraction from Cyclic Amines by the Cumyloxyl and Benzyloxyl Radicals. The Role of Stereoelectronic Effects and of Substrate/Radical Hydrogen Bonding”. *J. Org. Chem.*, **2012**, *77*, 8556-8561.
- P31.** M. Salamone, G. A. DiLabio, M. Bietti, “Reactions of the Cumyloxyl and Benzyloxyl Radicals with Strong Hydrogen Bond Acceptors. Large Enhancements in Hydrogen Abstraction Reactivity Determined by Substrate/Radical Hydrogen Bonding” *J. Org. Chem.*, **2012**, *77*, 10479-10487.
- P32.** M. Salamone, L. Mangiacapra, G. A. DiLabio, M. Bietti, “Effect of Metal Ions on the Reactions of the Cumyloxyl Radical with Hydrogen Atom Donors. Fine Control on Hydrogen Abstraction Reactivity Determined by Lewis Acid–Base Interactions” *J. Am. Chem. Soc.*, **2013**, *135*, 415-423.

**P33.** C. D'Alfonso, M. Bietti, G. A. DiLabio, O. Lanzalunga, M. Salamone, "Reactions of the Phthalimide N-Oxyl Radical (PINO) with Activated Phenols: The Important Role of pi-Stacking Interactions to Hydrogen Atom Transfer Rates" *J. Org. Chem.*, **2013**, *78*, 1026-1037.

**P34.** E. Johnson, M. Salamone, M. Bietti, G. A. DiLabio, "Modeling Non-Covalent Radical-Molecule Interactions Using Conventional Density-Functional Theory: Beware Erroneous Charge Transfer", *J. Phys. Chem. A*, *117*, 947-952.

**Programma del Corso di Chimica Organica (M-Z)** per il Corso di Laurea Triennale in Scienze Biologiche (7CFU)

Libri consigliati:

1. W. H. Brown, T. Poon "Introduzione alla Chimica Organica", Quarta edizione, Edises, 2011
2. J. McMurry "Chimica Organica – Un approccio biologico" 1<sup>a</sup> ed. italiana, Zanichelli, 2008.

Legame covalente e forma delle molecole. Acidi e Basi. Alcani e cicloalcani. Alcheni e alchini. Reazioni degli alcheni. Chiralità: l'asimmetria delle molecole. Alogenoalcani: reazioni di sostituzione nucleofila e  $\beta$ -eliminazione. Alcoli, eteri e tioli. Benzene e suoi derivati. Ammine. Aldeidi e chetoni. Acidi carbossilici. Derivati funzionali degli acidi carbossilici. Anioni enolato. Carboidrati. Amminoacidi e proteine. Acidi nucleici. Lipidi.

Covalent bonding and shape of molecules. Acids and bases. Alkanes and cycloalkanes. Alkenes and alkynes. Reactions of alkenes. Stereoisomerism and chirality. Haloalkanes: nucleophilic substitution and  $\beta$ -elimination reactions. Alcohols, ethers and thiols. Benzene and derivatives. Amines. Aldehydes and ketones. Carboxylic acids. Functional derivatives of carboxylic acid. Enolate anions. Carbohydrates. Amino acids and proteins. Nucleic acids. Lipids.