



MARIA MICHA-SCRETTA

Research Director

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Education

Diploma in Pharmacy, 1968, University of Athens
PhD in Pharmaceutical Chemistry, 1972, University of Athens

Employment

1972-1973 : Researcher, NRCPS “Demokritos”
1973: Researcher, National Hellenic Research Foundation
1985 (six months) : Visiting researcher, Wayne State Univ. of Detroit, Michigan
2000-present : Research Director, Institute of Organic and Pharmaceutical Chemistry

Other Activities

- July 2001-March 2003 : Depute Director of IOPC
- April 2009-until present : Depute Director of IOPC
- 2007-2008 Guest Editor of *Current Topics in Medicinal Chemistry* Title of the issue: “Biomedical Applications of Dendrimers” **2008**, Vol. 8, No. 14
- Member of basic team involved in the preparation of the proposal of Cost Action (TD0802), with the title: “Biomedical applications of Dendrimers”

Fellowships

1968-1972 : NRCPS, «Democritos» for PhD studies
1964-1967 : State fellowship (IKY) for undergraduate studies

Research Interests

Over 30 years experience in the field of Organic and Organometallic Chemistry and especially in the study of paramagnetic organometallic compounds and radical anions by multinuclear NMR.

Current research interests are focused on the synthesis of :

- design and synthesis of novel organic-organometallic compounds with applications in material science such as compounds with non-linear optical properties and as near infrared dyes
- design and synthesis of bioactive molecules and specifically with antioxidant activity
- recently we have initiated research activities in the field of dendrimer chemistry through the design and synthesis of new dendritic compounds with biomedical applications *such as drug delivery systems*, as *potent neuroprotective agents* acting as iron chelators, antibacterial activity. In parallel we plan exploit the newly synthesised dendritic molecules for applications in material science *e.g* for toxic metal complexation and in solid phase synthesis by increase the loading capacity of commercial available materials.

Funded Programmes

- *Coordinator and Scientist in Charge* for the IOPC programme for the Center of Excellence Research programme with the title; "Novel strategies Against Neurodegeneration" 2002-2005, (General Secretariat for Research and Technology) 200.000 €
- *Coordinator and Scientist in Charge* for the IOPC programme for the Center of Excellence Research programme with the title: "Design and Synthesis of Bioactive Molecules" (2005-2008) (General Secretariat for Research and Technology) 97.200 € (after the death of IOPC's Director Dr. Nikos Oikonomakos)

Participation in Joint Research Programmes

- "Conjugated Ladder-Type Oligomers and Polymers Containing Fused Six- and Five-Membered Rings" - Human Capital and Mobility Network (1/9/93-31/12/96)
The network comprised eight groups from the UK, Greece, Portugal, Italy and Germany.
- "Simple and Mixed Metal Alkyls, Alkoxides and Amides in Synthesis and Catalysis and as Precursors for Ceramic and Polymeric Materials" - Human Capital and Mobility Network (1/12/93-31/3/97)
The network was coordinated from the National Hellenic Research Foundation and comprised nine groups from Greece, UK, Ireland, Spain, France, Germany, The Netherlands
- "Design, Synthesis and Study of Novel Non-linear Optical Materials" - Training and Mobility of Researchers Network (1/10/96-30/9/99)
The network is being coordinated from the National Hellenic Research Foundation and comprises nine groups from Greece, UK, Ireland, France, Germany and Sweden.
- "Synthesis of Compatible Organic Additives for the Protection of Coloured Polyester Fibres from Photochemical Bleaching" Operational Programme for Research and Technology (EPET/YPER 97). A collaboration between the National Hellenic Research Foundation and VIOCHROM Ltd.
- "Design, Synthesis and Study of Novel Organometallic Near Infrared Dyes"
Marie Curie Intra-European Fellowships (1/2/2004-31/1/2006)

- “Solid Phase Phospholipid and Dendrimer Synthesis”
Marie Curie Host Fellowships for the Transfer of Knowledge (ToK) (1/2/2005-31/1/2009)
- REGPOT-2009-1 (FP7)-“ARCADE” (GA 245866)
"Advancement of Research Capability for the Development of New Functional Compounds"

Publications

- K. Gardikis, S. Hatziantoniou, M. Bucos, D. Fesas, M. Signorelli, T. Felekis, M. Zervou, C.G. Screttas, B.R. Steele, M. Ionov, **M. Micha-Screttas**, B. Klajnert, M. Bryszewska, C. Demetzos. *J.Pharm. Sci.* **2010**, *99*, 3561-3571 “New Drug Delivery Nanosystem Combining Liposomal and Dendrimeric Technology (Liposomal Locked-In Dendrimers) for Cancer Therapy”
- M. Bucos, C. Villalonga-Barber, **M. Micha-Screttas**, B.R. Steele, C.G. Screttas, G.A. Heropoulos, *Tetrahedron*, **2010**, *66*, 2061-2065 “Microwave assisted solid additive effects in simple dry chlorination reactions with N- chlorosuccinimide”
- K. Gardikis; S. Hatziantoniou; M. Signorelli; M. Pusceddu; **M. Micha-Screttas**; A. Schiraldi; C. Demetzos; D. Fessas, *Colloids and Surfaces B: Biointerfaces*, **2010**, Ref. No.: COLSUB-D-10-00352R1 “Thermodynamic and structural characterization of Liposomal-Locked in-Dendrimers as drug carriers”
- Carolina Villalonga-Barber, **Maria Micha-Screttas**, Barry R. Steele, Aristidis Georgopoulos and Costas Demetzos, *Cur. Top., Med. Chem*, **2008**, *8*, 14,1294-1309, “Dendrimers as Biopharmaceuticals: Synthesis and Properties”
- **Maria Micha-Screttas**, and Helmut Ringsdorf, *Cur. Top., Med. Chem*, **2008**, *8*, 14, 1294-1309, “Polymer Science and Polymer Therapeutics: Macromolecules, Dendrimers and Nanomedicine.”
- Frank Wiesbrock, Claudine Patteux, Tomasz K. Olszewski, Amélie Blanrue, Georgios A. Heropoulos, Barry R. Steele, **Maria Micha-Screttas**, and Theodora Calogeropoulou, *Eur.J.Org.Chem.* **2008**, 4344-4349
“Solution-Phase Synthesis and Scale-Up of 1st Generation Tetraester-Dendritic Branches Involving Microwave Irradiation and/or Ultrasound”
- G.Skretas, A.Meligova, C.Villalonga-Barber, D.Mitsiou, M.Alexis, **M.Micha-Screttas**, B.Steele, C.Screttas and D.Wood, *J.A.C.S.* **2007**, *129*(27), 8443-57
“Engineered chimeric enzymes as tools for drug discovery:Generating reliable bacterial screens for the detection, discovery and assessment of estrogen receptor modulators”
- B. R. Steele, S. Georgakopoulos, **M. Micha-Screttas** and C. G. Screttas, *Eur. J. Org. Chem.* **2007**, 3091-96. “Synthesis of new sterically hindered anilines”

- Barry R. Steele, Carolina Villalonga-Barber, **Maria Micha-Screttas** and Constantinos G. Screttas, *Tetrahedron Lett.* **2006**, 47, 2093-2097
“Selective catalytic carbanionic ethylation of methylphenols: influence of catalyst and substitution pattern”
- Carolina Villalonga-Barber, Barry R. Steele, Veronica Kovač, **Maria Micha-Screttas** and Constantinos G. Screttas, *J. Organom. Chem.* **2006**, 691, 2785-92
“New stable, isolable triarylmethyl based dyes absorbing in the near infrared”
- K. Gardikis, **M. Micha-Screttas**, B. Steele and C. Demetzos, *Pharmaceutiki*, **2006**, 19, IV, 89-92, “An Overview of Dendrimers and their biomedical Applications”
- C.G. Screttas, G.A. Heropoulos, **M. Micha-Screttas** and B.R. Steele, *Tetrahedron Lett.* **2005**, 46, 4357-4360 “Medium-dependent lithiated side products in the reductive lithiation of allylic phenyl thioethers. Diethyl ether versus tetrahydrofuran”
- A. Lazaridou, C.G. Biliaderis, **M. Micha-Screttas** and B.R. Steele, *Food Hydrocolloids*, **2004**, 18, 837-55 “A comparative study on structure – function relations of mixed linkage, linear β -D-glucans”
- B.R. Steele, **M. Micha-Screttas** and C.G. Screttas, *Tetrahedron Lett.*, **2004**, 45, 9537-9540. “Synthesis and properties of 1-bromo-2,3,5,6-tetrakis(3-pentyl)benzene : a highly sterically hindered aryl bromide”
- D.P. Catsoulacos, B.R. Steele, G.A. Heropoulos, **M. Micha-Screttas** and C.G. Screttas, *Tetrahedron Lett.*, **2003**, 44, 4575-4578.
“An iminophosphine dendrimeric ligand and its evaluation in the Heck reaction.”
- C.G. Screttas, G.A. Heropoulos, **M. Micha-Screttas**, B.R. Steele and D.P. Catsoulacos, *Tetrahedron Lett.*, **2003**, 44, 5633-5635 “Reductive lithiation of alkyl phenyl sulfides in diethyl ether. A ready access to α,α -dialkylbenzylolithiums”.
- B.R. Steele, **M. Micha-Screttas** and C.G. Screttas, *Appl. Organometal. Chem.* **2002**, 16, 501-5 “Applications of novel sterically demanding aromatics in organometallic synthesis”
- **M. Micha-Screttas**, C.G. Screttas, B.R. Steele and G.A. Heropoulos *Tetrahedron Lett.* **2002**, 43, 4871-73 “Chemical and physical evidence for metal-metal interchange between lithium alkoxides and di-*n*-butylmagnesium
- **M. Micha-Screttas**, G.A. Heropoulos, B.R. Steele, *Mag. Res. Chem.* **2001**, 39, 586-92
“Stability of alkali metal monosubstituted benzophenone radical anions with respect to solvent perturbations”
- C.S. Salteris, I.D. Kostas, **M. Micha-Screttas**, G.A. Heropoulos, C.G. Screttas and A. Terzi *J. Org. Chem.* **1999**, 64, 5589-5592
“*ortho*-Directed lithiation of ω -phenoxyalcohols”

- C.S. Salteris, I.D. Kostas, **M. Micha-Screttas**, G.A. Heropoulos, C.G. Screttas*, A. Terzis *Main Group Met. Chem.* **1999**, 22, 427-434
“*ortho*-Directed lithiation of ω -phenoxyalkanethiols and *N,N*-dimethyl, ω -phenoxyalkaneamines. Crystal structure of bis[*o*[(dimethylamino)ethoxy]phenyl]mercury”
- C.S. Salteris, I.D. Kostas, **M. Micha-Screttas**, B.R. Steele, G.A. Heropoulos, C.G. Screttas and A. Terzis *J. Organomet. Chem.*, **1999**, 590, 63-70,
“Synthesis of lithium ω -(*m*- and *p*-lithiophenoxy)alkoxides modified with magnesium 2-ethoxyethoxide. Crystal structures of bis [4-(2-hydroxyethoxy)phenyl]mercury and bis[4-(3-hydroxypropoxy)phenyl]mercury”
- **M. Micha-Screttas**, G.A. Heropoulos and B.R. Steele
J. Chem. Soc Perkin Transactions 2, **1999**, 7, 1443-1446
“Evidence for a concentration dependent $^{6(7)}\text{Li}$ NMR contact shift in tetrahydrofuran solutions of lithium naphthalene radical anion and the effect of added $^{6(7)}\text{LiCl}$ “
- **M. Micha-Screttas**, G.A. Heropoulos and B.R. Steele,
J. Chem. Soc Perkin Transactions 2, **1999**, 12, 2685-2690
“Interaction between alkali metal aromatic ketone radical anions and the chlorides of lithium and magnesium in solution. A case of a carbon-carbon bond strengthening through complex formation”
- A. Detsi, **M. Micha-Screttas** and O. Igglessi-Markopoulou*,
J. Chem. Soc. Perkin Trans. 1 **1998**, 2443
“Synthesis of *N*-alkoxycarbonyl-3-substituted tetramic acids and functionalized enols *via C*- acylation reactions of active methylene compounds with *N*-hydroxysuccinimide esters of *N*-alkoxycarbonyl- α -amino acids”
- C.G. Screttas, **M. Micha-Screttas** and B.R. Steele
J. Organomet. Chem. **1997**, 536, 149-163
“The *tert*-butyl chloride-lithium naphthalene radical anion and *tert*-butyllithium-naphthalene systems. Mechanism of metallation”
- C.G. Screttas, G.I. Ioannou and **M. Micha-Screttas** *J. Organomet. Chem* **1996**, 511, 217-225 “Stoichiometry of Protonation of Aromatic Hydrocarbon Radical Anions by Weak Proton Donors. A Marked Discrepancy Between the Number of Protons Used and those Incorporated into the Aromatic Structure”.
- C.G. Screttas and **M. Micha-Screttas**
J. Org. Chem., **1991**, 56, 4, 1615
“Some Properties and trends of enthalpies of vaporization and of Trouton’s ratios of organic compounds. Correlation of enthalpies of vaporization and of enthalpies of formation with normal boiling points”.
- C.G. Screttas and **M. Micha-Screttas**
Bull. Soc. Chim. Belg. **1991**, 100, 199
“Spectroscopic electronegativities of halogens are transferable and additive parameters. Examples of correlations with thermochemical and nuclear magnetic resonance spectroscopic data”

- **Maria Micha- Screttas**
Mag. Res. Chem. **1990**, 28, 952-955
“Spectroscopic electronegativities correlated with the ^{13}C NMR shifts of metal (Ia, II a, III a) 2-ethoxyethoxides”.
- F.S. Varveri, J. Nikokavouras, A.E. Mantaka-Marketou and **M. Micha-Screttas**
Monats. fur Chemie , **1989**, 120, 967-971
“Synthesis of terminally substituted 9-alkylidene-10-methyl acridans”
- C.G . Screttas and **M. Micha-Screttas**
J. Org. Chem., **1989**, 54, 5132 ,
“Correlation of thermochemical data with gas-phase ionization potentials”
- C.G. Screttas and **M. Micha-Screttas**
J. Am. Chem. Soc., **1987**, 109, 24, 7574
“Radical anions in hydrocarbon media. interaction between unsolvated and / or solvated radical anions and metal alkoxides . evidence for cation - dependent clustering of ketyl anions at high concentrations”
- C.G . Screttas and **M. Micha-Screttas** *J. Organomet. Chem.*, **1986**, 316,1
“Hexane-soluble complexes of alkyl- and alkenyl -sodium compounds with magnesium alkoxides”.
- C.G. Screttas and **M. Micha-Screttas** *J. Organomet. Chem.*, **1985**, 290, 1
“The diphenylmagnesium / alkali metal alkoxide system . hydrocarbon soluble organoalkali metal reagents”.
- C.G. Screttas and M. Micha-Screttas *J. Organomet. Chem.*, 1985, 292, 325
“Preparation of solvated and/or unsolvated simple and mixed diarylmagnesiums”.
- C.G. Screttas and **M. Micha-Screttas** *Organometallics*, **1984** , 3, 904
“Hydrocarbon - soluble organoalkali-metal reagents. preparation of alkylo derivatives”.
- C.G. Screttas and **M. Micha-Screttas**, *J. Org. Chem.* **1983**, 48, 153
“Paramagnetic solvent NMR shifts in radical anion solutions 2. Some cation dependent phenomena in concentrated solutions of aromatic hydrocarbon radical anions and dianions”.
- C.G. Screttas and **M. Micha-Screttas** *J. Org. Chem.* **1983**, 48, 252
“Paramagnetic solvent NMR shifts in radical anion solutions 3. A kinetic method for measuring molar paramagnetic solvent shifts of unstable of unstable radical anions”
- C.G. Screttas and **M. Micha-Screttas** , *J. Phys. Chem.* **1983**, 87, 3844
“Paramagnetic Solvent NMR Shifts in Radical Anion Solutions 4. Carbon-13 Contact Shifts and Mechanism of Spin Density and/or Electron

Transfer to Substrate”.

- C.G. Screttas and **M. Micha-Screttas**, *J. Organomet. Chem.* **1983**, 252, 263 “Single -Titration Method for the Determination of Lithium Naphthalenide in Tetrahydrofuran”.
- C.G. Screttas, **M. Micha-Screttas** and C.T. Cazianis , *Tetrahedron Lett*, **1983**, 24, 3287 “The Benzilic Ester Rearrangement. Evidence for a SET Pathway in Benzilic Ester and/or acid Rearrangement”.
- C.G. Screttas and **M. Micha-Screttas**, *J. Org. Chem.* **1982**, 47, 3008 “Synthesis of Benzhydryl Ethers by C-C Forming Reaction Using Benzydryl 2-Chloroethyl. A Method for Attaching a Protected 2- Hydroethyl Group to Benzylic Carbon”.
- C.G. Screttas and **M. Micha-Screttas** *J. C. S. Chem. Commun.* **1982**, 1168 “Carbon -13 Contact Solvent Shifts in Radical Anion Solutions. Mechanism of Spin Density Transfer to Solvent”.
- C.G. Screttas and **M. Micha-Screttas**, *J. Org. Chem.* **1981**, 46, 993 “Structure of radical anions in solution as deduced from paramagnetic solvent shifts as molecular parameters for understanding structure, reactivity and solute-solvent interactions in ketyl anion solutions”.
- C.G. Screttas and **M. Micha-Screttas**, *J. Org. Chem.* **1979**, 44, 713 “Markownikoff two-step hydrolithiation of α -olefins.transformation of secondary and tertiary alkyl phenyl sulfides to alkyllithium reagents”.
- C.G. Screttas and **M. Micha-Screttas**, *J. Org. Chem.* **1978**, 43, 1064 “Hydrolithiation of α -olefins by regiospecific two-step process.transformation of alkyl phenyl sulfides to alkyllithium reagents”.
- **M. Micha-Screttas** and C.G. Screttas,*J. Org. Chem.* **1977**, 42, 1462 “Preparation of alkyl phenyl sulfides by electrophilically catalysed displacement of certain nucleophiles by thiophenoxy group”

Patent

Number Gr:1005435

Title: “New substituted stilbenoid derivatives with neuroprotective activity”

M. Micha-Screttas, C. Villalonga Barber, B.R. Steele, M.N. Alexis

International Conferences (2000-2009)

- **M. Micha-Screttas**, G.A. Heropoulos, B.R. Steele and C.G. Screttas, *XIXth Internat. Conference on Organometallic Chemistry, Shanghai, China, 2000*, “Metallation of (methylaryl)phosphines and phosphine oxides and their transformation to useful ligands for transition metal catalysis”

- **M. Micha-Screttas**, G.A. Heropoulos and B.R. Steele,
XIXth Internat. Conference on Organometallic Chemistry, Shanghai, China, 2000
“Effect of additives such as salts and co-solvent on the structure of alkali metal aromatic ketone radical anions in solution”
- **M. Micha-Screttas**, C.G. Screttas, B. R. Steele and G. A. Heropoulos.
6th FIGIPS Meeting in Inorganic Chemistry, Barcelona, July 2001.
“Chemical and physical evidence for metal-metal interchange between lithium ⁶Li- alkoxyethoxide and dibutylmagnesium”
- B.R. Steele, **M. Micha-Screttas** and C.G. Screttas
XIVth FECHM Conference on Organometallic Chemistry, 2001, Gdansk, Poland. “Applications of novel sterically demanding aromatics in organometallic synthesis”.
- B.R. Steele, D.P. Catsoulacos, G.A. Heropoulos, **M. Micha-Screttas** and C.G. Screttas,
XVth FECHM Conference on Organometallic Chemistry, Zurich, Switzerland, August, 2003 “Synthesis and characterisation of an imino-phosphine dendrimeric ligand and its application in the Heck reaction”
- G.A. Heropoulos, C.G. Screttas, **M. Micha-Screttas**, D.P. Catsoulacos and B.R. Steele,
XVth FECHM Conference on Organometallic Chemistry, Zurich, Switzerland, August, 2003. “Reductive lithiations in diethyl ether: preparation of benzylic organolithium reagents”
- D.P. Catsoulacos, B.R. Steele, G.A. Heropoulos, **M. Micha-Screttas** and C.G. Screttas, 3rd
International Dendrimer Symposium, Berlin, Germany, September, **2003.**
“An imino-phosphine dendrimeric ligand and its evaluation in the Heck reaction”
- C. Villalonga-Barber, C. Kouzinos, **M. Micha-Screttas**, B.R. Steele and C.G. Screttas, 15th International Conference on Organic Synthesis, Nagoya, Japan, August **2004.** “Antioxidant stilbene derivatives and iron chelators”
- C.G. Screttas, G.A. Heropoulos, B.R. Steele and **M. Micha-Screttas**, 15th
International Conference on Organic Synthesis, Nagoya, Japan, August **2004.**
“Reductive lithiation allylic phenylthioethers in diethyl ether: a remarkable solvent effect”
- C.G. Screttas, **M. Micha-Screttas**, G.A. Heropoulos and B.R. Steele
14th International Symposium on Organic Chemistry, 4-8 July **2005**, Helsinki, Finland
“ Iminochlorides as useful synthons”
- C. Villalonga-Barber, **M. Micha-Screttas**, B.R. Steele and C.G. Screttas,
14th International Symposium on Organic Chemistry, 4-8 July **2005**, Helsinki, Finland
“New organometallic chromophores as potential near-infrared dyes”
- C. Villalonga-Barber, V. Kovač, B.R. Steele, **M. Micha-Screttas**, C.G. Screttas, XVIth
FECHM Conference on Organometallic Chemistry, Budapest, Hungary, September, **2005.**

“Novel Ferrocenyl Near-Infrared Dyes”

- M.Micha-Screttas, C.villalonga, A.Meligova, B.R.Steele, C.Kouzinou, C.G.Screttas, E.S.Katsanou and M.N.Alexis, 16th International Conference on Organic Synthesis, Mérida, México, June 11-15, **2006** “Synthesis of neuroprotective hydroxy-stilbenoid analogs and evaluation of their activities against breast and endometrial cancer cells”
- C.G.Screttas, B.R.Steele, S.Georgakopoulos and M.Micha-Screttas, 16th International Conference on Organic Synthesis, Mérida, México, June 11-15, 2006 “ Synthetic routes to new sterically demanding aromatic amines”
- Claudine Patteux, Tomasz K. Olsewski, Barry R. Steele, Georgios A. Heropoulos, and **Maria Micha-Screttas**, 5th International Dendrimer Symposium, (August 28-September 1, **2007**, Toulouse, France) “Dendrimer modified solid phase supports”
- Tomasz K. Olszewski, Claudine Patteux, Georgios A. Heropoulos, Barry R. Steele and **Maria Micha-Screttas**, 5th International Dendrimer Symposium, (August 28-September 1, **2007**, Toulouse, France) “Solution phase synthesis of a polyether dendron and its immobilisation on a solid-phase support”
- K. Gardikis, T. Felekis, B.R. Steele, P. Zoumboulakis, C.G. Screttas, C. Demetzos, M. **Micha-Screttas**, International Conference on Nanomedicine, Chalkidiki, Greece, September **2007**. “Design and synthesis of new hydroxy-terminated dendrimers. Initial studies of the encapsulation mechanism using molecular modelling techniques”
- B.R. Steele, S. Georgakopoulos, C. Villalonga-Barber, K.A. Vallianatou, G.A. Heropoulos, **M. Micha-Screttas**, International Dendrimer Symposium 6, Stockholm, Sweden, June **2009**. “Synthetic approaches towards dendrimeric organometallic near-infrared dyes”
- G.A. Heropoulos, M. Sleiman, **M. Micha-Screttas**, B.R. Steele, T. Calogeropoulou,, International Dendrimer Symposium 6, Stockholm, Sweden, June **2009**. “New “Click Chemistry” routes to polyhydroxy dendrons”
- M. Micha-Screttas, K. Gardikis, S. Hatziantoniou, C. G. Screttas, B. R. Steele, M. Ionov, D. Wrobel, M. Bryszewska, M. Signorelli, D. Fessas, C. Demetzos, International Dendrimer Symposium 6, Stockholm, Sweden, June 2009. “Liposomal locked in dendrimer technology in biomedical applications”
- M. Bucos, C. Villalonga-Barber, M. Micha-Screttas, B.R. Steele, C.G. Screttas, G.A. Heropoulos, 11th Frank Warren Conference, Pietermaritzburg, South Africa, January 2010. «Passive heating element and salt effect on simple microwave assisted chlorination reactions»

