

Gloria Proni

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Professional Appointments

2010-present Associate Professor - John Jay College of Criminal Justice

Organic Chemistry II lecturer and course coordinator (undergraduate class)
Organic Structure Determination (graduate class – Forensic Science Master Program).

- Organize the organic chemistry course (lecture, laboratory and recitation); Supervise five teaching assistants;
- Lecture a course in spectroscopy and spectrometry with a focus in applied forensic science

2003-2009 Assistant Professor - John Jay College of Criminal Justice,

Organic Chemistry I, II lecturer and course coordinator (undergraduate class)
Organic Structure Determination (graduate class – Forensic Science Master Program).

- Organized the organic chemistry course (lecture, laboratory and recitation); Supervised five teaching assistants;
- Developed a course in spectroscopy and spectrometry with a focus in applied forensic science

2003 Adjunct Assistant Professor at John Jay College of Criminal Justice, Organic Chemistry II.

Degrees

1995-2000 PhD in Cellular and Molecular Biotechnologies, University of Bologna, Italy.
Thesis title: "The chirality of the cholesteric phases of DNA and G-wires and its connection to their molecular structures".
Ph.D. advisor: Dr. G. Gottarelli

1990-1995 "Laurea" (5-years course) cum Laude in Medicinal Chemistry, University of Bologna, Italy.
Thesis title: "Synthesis and self-assembly of dideoxyguanosine(3'-3') and (5'-5')-monophosphates".
Thesis advisor: Dr. G. Gottarelli

Additional Higher Education

- 2001-2003** Individual National Research Award Post-Doctoral Fellow, National Institute of Health, NIH
Project Title: "Metalloporphyrin hosts in structural studies by CD/FDCD"
Mentor: Dr. K. Nakanishi, Columbia University, NY

Teaching in Other Institution

- 2001-2003** Science Honors Program High School Instructor, Environmental and Organic Chemistry, Columbia University.

Peer Reviewed Journal Articles *signifies articles written with masters students as co-authors; ~signifies articles written with undergraduate students as co-authors

- N. Nesnas, Y. Ouedraogo, L. Huang, M. Plaza-Mayorca, G. Proni, E. Chadwick, R. J. Wehmshulte, A two step stereoselective synthesis of a fish pheromone from cortexolone, *Chirality*, submitted.~
- A. G. Petrovic, G. Vantomme, Y. L. Negron-Abril, E. Lubian, G. Saielli, I. Menegazzo, R. Cordero, G. Proni, K. Nakanishi, T. Carofiglio, N. Berova, Bulky melamine based Zn-porphyrin tweezer as a CD probe of molecular chirality, *Chirality*, 2011, 23(9), 808-819.~
- K. B. Killday, M. H. Davey, J. A. Glinski, G. Proni, F. J. Daugherty, M. S. Tempesta, Bioactive Type A Proanthocyanidins from Cinnamon (*Cinnamomum cassia*), *Journal of Natural Products*, 2011, 74, 1833-1841.
- K. Kpegba, A. Agbonon, Petrovic, A., E. Amouzou, M. Gbeassor, G. Proni, N. Nesnas, Epiafzelechin from the root bark of *Cassia Sieberiana*: detection by DART mass spectrometry, spectroscopic characterization, and antioxidant properties, *Journal Natural Products*, 2011, 74(3), 455-459.
- K. L. Tregar, G. Proni, A review of forensic higher education programs in the United States: bachelor's and master's degrees, *Journal of Forensic Science*, 2010, 55 (6), 1488-1493.*
- J. Liu, J. Decatur; G. Proni, E. Champeil. Identification and quantitation of 3,4-methylenedioxy-N methylamphetamine (MDMA, ecstasy) in human urine by 1H NMR spectroscopy. Application to five cases of intoxication. *Forensic Science International*, 2010, 194(1-3),103-107.
- A. Petrovic, Y. Chen, G. Pescitelli, N. Berova, G. Proni, CD-sensitive Zn-porphyrin tweezer host-guest complexes. Part 1: MC/OPLS-2005 computational approach for predicting preferred interporphyrin helicity, *Chirality*, 2010, 22(1), 129-139.
- Y. Chen, A. Petrovic, M. Roje, G. Pescitelli, Y. Yang, M. Kayser, N. Berova, G. Proni, CD-sensitive Zn-porphyrin tweezer host-guest complexes. Part 2: cis- and trans-3-hydroxy-4-aryl/alkyl-beta-lactams. A case study, *Chirality*, 2010, 22(1), 140-152.
- N. Berova, R. Pescitelli. A. G. Petrovic, G. Proni, Probing molecular chirality by CD-sensitive dimeric porphyrin hosts, *Chemical Communication*, Feature Article, 2009, 40, 5958-5980.
- E. Champeil, G. Proni, D. Sapse, *Ab initio* studies of receptor interaction with AMPA ((S)-2-amino-3-(3-hydroxy-5-methyl-4-isoxazolyl)propionic acid) and kainic acid (2S-(2a, 3b, 4b))-2-carboxy-4-(1-methylethenyl)-3-pyrrolinacetic acid, *Journal of Molecular Modeling*, 2009, 15,9,11045-1117
- E. Champeil, C. Crean, G. Pescitelli, G. Proni, L. Ghosez, Synthesis and characterization of novel diastereomeric [60]fullerenyl amino acid derivatives through the anionic route. *Tetrahedron*, 2008, 64,45, 10319-10330.
- N. D. K. Petraco, G. Proni, J. J. Jackiw, D. Sapse, A. M. Sapse, Aminoacidalanine reactivity with ninhydrin. A detailed *ab-initio* computational study. *Journal of Forensic Sciences*, 2006, 51(6), 1267-1275.
- M. Balaz, A. E. Holmes, M. Benedetti, G. Proni, N. Berova; Porphyrin substituted phosphoramidites: new building blocks for porphyrin-oligonucleotide syntheses, *Bioorganic & Medicinal Chemistry*, 2005, 13(7), 2413-2421.
- M. Balaz, A. E. Holmes, M. Benedetti, P. C. Rodriguez, N. Berova, K. Nakanishi, G. Proni; Synthesis and circular dichroism of tetrarylporphyrin-oligonucleotide conjugates, *Journal of the American Chemical Society*, 2005, 127(12), 4172-4173.

- Z. Dai, G. Proni, D. Mancheno, S. Karimi, N. Berova, J. W. Canary; Detection of zinc ions by differential circularly polarized fluorescence excitation, *Journal of the American Chemical Society*, 2004, 126(38), 11760-11761.
- M. Giraud-Roux, G. Proni, K. Nakanishi, N. Berova; Syntheses and spectroscopic properties of methylbenzoate derivatives of tetrabenzoporphyrin, application to circular dichroism studies, *Heterocycles*, 2003, 61, 417-432
- G. Proni, G. Pescitelli, X. Huang, K. Nakanishi, N. Berova; Magnesium tetraarylporphyrin tweezer: a CD-sensitive host for absolute configurational assignments of α -chiral carboxylic acids, *Journal of the American Chemical Society*, 2003, 125(42), 12914-12927.
- G. Proni, G. Pescitelli, X. Huang, N. Quraishi, K. Nakanishi, N. Berova; Configurational assignment of α -chiral carboxylic acids by complexation to dimeric Zn-porphyrin: host/guest structure, chiral recognition and circular dichroism, *Chemical Communication*, 2002, 15, 1590-1591.
- G. Proni, G. P. Spada; Doped nematic phases: a tool for amplifying and detecting chirality, *Enantiomer*, 2001, 6, 171-179.
Cited in the Cover Story of the *Chemical & Engineering News*, June 10th, 2002, 80 (23), 51-57.
- S. Zahn, G. Proni, G. P. Spada, J. W. Canary; Supramolecular detection of metal ion binding: Ligand conformational control of cholesteric induction in nematic crystalline phases, *Chemistry European Journal*, 2001, 7, 1.
- G. Proni, G. P. Spada, P. Lustenberger, R. Welti, F. Diederich; Conformational analysis in solution of C₂-symmetric 1,1'-binaphthyl derivatives by circular dichroism spectroscopy and cholesteric induction in nematic mesophases, *Journal of Organic Chemistry*, 2000, 65, 5522-5527.
- G. Proni, G. Gottarelli, P. Mariani, G. P. Spada; The chirality of the cholesteric phases of DNA and G-wires and its connection to their molecular structures, *Chemistry European Journal*, 2000, 6 (17), 3249-3253.
- M. Bandini, S. Casolari, P. G. Cozzi, G. Proni, E. Schmohel, G. P. Spada, E. Tagliavini, A. Umani-Ronchi; Synthesis and characterization of new enantiopure 7,7'-disubstituted 2,2'-dihydroxy-1,1'-binaphthyls: useful ligands for the asymmetric allylation reaction of aldehydes; *European Journal of Organic Chemistry*, 2000, 491-497.
- S. Superchi, M. I. Donnoli, G. Proni, G. P. Spada, C. Rosini; Induction of cholesteric mesophases by simple cyclic derivatives of p,p'-disubstituted 1,2-diphenylethane-1,2-diols: importance of shape and electronic factors; *Journal of Organic Chemistry*, 1999, 64, 4762-4767.
- G. P. Spada, G. Proni; The nematic liquid crystal phase as a probe of the molecular shape helicity; *Enantiomer*, 1998, 3(4/5), 301-314.
- G. Proni, G. P. Spada, G. Gottarelli, F. Ciuchi, P. Mariani; The self-assembly of dideoxyguanosine (3',3') and (5',5')-monophosphates; *Chirality*, 1998, 10, 734-741.
- G. Gottarelli, G. Proni, G. P. Spada, S. Bonazzi, A. Garbesi, F. Ciuchi, P. Mariani; The self-assembly and liquid crystal formation of d(GpGpApGpG); *Biopolymers*, 1997, 42(5), 561-574.
- F. M. H. de Groot, G. Gottarelli, S. Masiero, G. Proni, G. P. Spada, N. Dolci; Towards a radiation-sensitive quasi-biological display; *Angewandte Chemie, International Edition English*, 1997, 36(9), 954-955.
- G. Gottarelli, G. Proni, G. P. Spada; The Self-Assembly and the lyotropic mesomorphism of riboguanic acids (GMP); *Liquid Crystal*, 1997, 22(4), 563-566.
- C. Rosini, G. P. Spada, G. Proni, S. Masiero, S. Scamuzzi; Conformational analysis of some *trans*-4,5-Diaryl-1,3-dioxolanes by CD spectroscopy and induction of cholesteric mesophases in nematic solvents: a correlation between twisting power and structure of the dopant; *Journal of the American Chemical Society* 1997, 119, 506-512.
- G. Gottarelli, G. Proni, G. P. Spada, D. Fabbri, S. Gladioli, C. Rosini; Conformational and configurational analysis of 4,4'-biphenanthryl derivatives and related helicenes by circular dichroism spectroscopy and cholesteric induction in nematic mesophases, *Journal of Organic Chemistry*, 1996, 61(6), 2013-2019.
- G. Gottarelli, G. Proni, G. P. Spada; The Effect of ions on the chiral self-assembly and liquid crystal formation of 2'-deoxyguanosine 3'- and 5'-phosphates; *Enantiomer*, 1996, 1(3), 201-209.

Manuscripts in progress *signifies articles written with masters students as co-authors; ~signifies articles written with undergraduate students as co-authors

- T. Klepfitz, M. Szpilowska, L. Appesh, J. J. Jackiw, G. Proni, Identification of full and partial prints using the AFIX Tracker® identification system, *Journal of Forensic Identification*, in preparation~*
- A. Popova, G. Proni, Synthesis of red 40 and yellow 5: natural dyes present in drinks and food coloring paste, *J. Chem. Edu.*, in preparation~

- J. Field, M. Valetutti, G. Proni, Index of freshness analysis of tuna sushi and sashimi gathered from New York city markets, *J. Food Comp. Anal.*, in preparation~*
- A. Vasquez, M. Chen, R. Cordero, G. Proni, Fluorescence and fingerprint detection properties of lawsone's derivatives, *Chem. Eur. J.*, in preparation

Conferences Presentations *signifies research which involved masters students as co-authors;

~signifies research which involved undergraduate students as co-authors

- P. Troselj, G. Mazzeo, G. Proni, T. Carofiglio, A. G. Petrovic, N. Berova, Host-guest complexes with metalloporphyrin tweezers: insight into factors determining molecular recognition and chiroptical response, *ICCP-7 7th International Conference on Porphyrin and Phthalocyanines*, Jeyu, Korea, July 1-6, 2012
- R. Cordero, G. Proni, A. G. Petrovic, Helical molecular programming via supramolecular complexation of bis-porphyrins, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 4th 2013
- I. Campoverde, G. Proni, NMR- based study of urines of opioids overdosed patients: Preliminary data, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May
- J. Field, G. Proni, Index of Freshness Analysis of Tuna Sushi and Sashimi Gathered from New York City Markets, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May
- Q. Jameel, O. Mosadoluwa, S. Solomon, P. Estrada, G. Proni, A. G. Petrovic, Absolute configuration determination of organophosphorus pesticides, *243rd ACS National Meeting*, San Diego, CA, March 25-29, 2012~
- M. Obatusina, R. Cordero, Q. Jameel, G. Proni, A. G. Petrovic, Helical molecular programming via supramolecular complexation of bis-porphyrins, *243rd ACS National Meeting*, San Diego, CA, March 25-29, 2012~
- A. Vasquez, G. Proni, Preparation of lawsone derivatives, analysis of their fluorescence properties and application to fingerprint detection, *37th Northeastern Association of Forensic Scientists*, Newport, RI, November 1-5, 2011;*
- A. G. Petrovic; G. Mazzeo, G. Proni, T. Carofiglio, N. Berova, Stereo-discriminating power of Zn-porphyrin tweezers: the key feature for chirality assignment *ISCD-23*, Liverpool, England, July 10-13, 2011;
- J. Field, G. Proni, Determination of the freshness of fish via HPLC determination of ATP and amines derivatives, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 13th, 2011~
- R. Cordero, G. Proni, New zinc porphyrin tweezers in a host-guest complex: absolute configuration determination of amines, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 13th, 2011~
- I. Campoverde, G. Proni, NMR-based study of urines overdosed patients: preliminary data, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 13, 2011~
- N. Dalton, G. Proni, Absolute configurational assignment of a self assembling light harvesting porphyrin using the tweezer approach, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 13th, 2011~
- A. Saenz, G. Proni, Supramolecular properties of porphyrin-guanosine conjugates, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 13th, 2011~
- A. Vasquez, G. Proni, Preparation of lawsone derivatives, analysis of their fluorescence properties and application to fingerprint detection, *Celebrating Graduate Students Research @ John Jay*, John Jay College, NY, May 5-10, 2011;*
- N.-Nesnas, Y. P. Ouedraogo, L. Huang, M.D. Plazaz-Mayorca, G. Proni, E. Chadwick, R. J. Wehmschulte, A two-step stereoselective synthesis of a fish pheromone from cortexolone, *FAS2011*, Melbourne, FL, April 11-12, 2011;~
- R. Cordero, G. Proni, New zinc porphyrin tweezers in a host-guest complex: absolute configuration determination of amines, *19th Annual Collegiate Science and Technology Entry Program (CSTEP) Statewide Conference 2011*, The Sagamore Resort, Balton Landing, NY, April 1-3 2011;~
- I. Campoverde, G. Proni, NMR-based study of urines overdosed patients: preliminary data, *19th Annual Collegiate Science and Technology Entry Program (CSTEP) Statewide Conference 2011*, The Sagamore Resort, Balton Landing, NY, April 1-3 2011;~
- A. Vasquez, G. Proni, Preparation of lawsone derivatives, analysis of their fluorescence properties and application to fingerprint detection, *36th Northeastern Association of Forensic Scientists*, Manchester, VT, November 8-12, 2010;* participated to the P. R. De Forest Collegiate competition.

- Y. Rada, G. Proni, Analysis of lawsone's derivatives for latent fingerprint detection and comparison, 36th *Northeastern Association of Forensic Scientists*, Manchester, VT, November 8-12, 2010;*
- G. Proni, N. Tan, D. K. Wilson, E. Champeil, B. S. Levine, Nuclear magnetic resonance- (NMR-) based study of most-mortem urines of opioids overdosed patients: scope and limitations of the technique, 240th *ACS National Meeting*, Boston, MA, August 22-26, 2010;~*
- R. Cordero, G. Proni, C. Zuccaccia, A. Macchioni, Multicationic organometallic dendrimers: synthesis and intra- and inter-molecular NMR characterization, 240th *ACS National Meeting*, Boston, MA, August 22-26, 2010;~
- G. Proni, N. Capitali, A. Petrovic, Spectroscopic characterization and absolute configuration determination of profenofos, an organophosphate compound, 240th *ACS National Meeting*, Boston, MA, August 22-26, 2010;*
- R. Cordero, G. Proni, Fingerprint Analysis with an automated identification system, *EXPO 2010 17th Annual Florida-Georgia Louis Stokes Alliance for Minority Participation (LSAMP)*, University of South Florida, FL February 26-28, 2010;~
- T. Klepfitz, G. Proni, Novel reagents to detect fingerprints: preparation and characterization of a chemical derivative of lawsone, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 7th, 2010;~
- E. Gonzalez-Lopez, G. Proni, Zinc porphyrin tweezer in host-guest complexation: absolute configurational assignment of a self-assembling, light harvesting porphyrin by circular dichroism, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 7th, 2010;~
- R. Cordero, G. Proni, Fingerprint Analysis with an automated identification system: AFIX, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 7th, 2010;~
- E. Gonzalez-Lopez, G. Proni, Zinc porphyrin tweezer in host-guest complexation: absolute configurational assignment of a self-assembling, light harvesting porphyrin by circular dichroism, 14th *Annual Urban University Conference, New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)*, Brookhaven National Laboratory, NY April 23-24, 2010~
- R. Cordero, G. Proni, Fingerprint Analysis with an automated identification system: AFIX, 14th *Annual Urban University Conference, New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)*, Brookhaven National Laboratory, NY April 23-24, 2010~
- Y. Rada, G. Proni, Development of New Reagents for the Detection of Latent Fingerprints, *American Academy of Forensic Science (AAFS) 62nd*, Seattle, WA, February 22-27, 2010;*
- A. Vasquez, G. Proni, Preparation of Lawsone's derivatives, analysis of their fluorescence properties and application to fingerprint detection, CUNY Pipeline Honors Conference, Graduate Center, New York, NY, February 19th, 2010;~
- E. Champeil, G. Proni, J. Liu, NMR Analysis of 3,4-methylenedioxy-N-methylamphetamine (MDMA or Ecstasy) and its Metabolites in Urine, *American Academy of Forensic Science (AAFS) 62nd*, Seattle, WA February 22-27, 2010;*
- J. Liu, E. Champeil, G. Proni, NMR Analysis of 3,4-methylenedioxy-N-methylamphetamine (MDMA) in Urine, 35th *Northeastern Association of Forensic Scientists*, Long Branch, NJ, November 4-6, 2010;*
- A. G. Petrovic, C. Nunez, G. Proni, N. Berova, E. Lubian, T. Carofiglio, Probing the chirality of diamines by novel CD-sensitive dimeric Zn-porphyrin tweezers, *CD2009 – 12th International Conference on Circular Dichroism*, Brescia, Italy, August 30- September 4, 2009;
- A. Vasquez, G. Proni, Lawsone's derivatives: new reagents for fingerprint detection, *Celebrating student research @ John Jay - PRISM Research Symposium*, John Jay College, May 7-8, 15, 2009;~
- A. Vasquez, G. Proni, Lawsone's derivatives: new reagents for fingerprint detection, *Collegiate Science and Technology Entry Program (CSTEP) Statewide Conference 2009*, The Sagamore Resort, Balton Landing, NY, April 3-5, 2009;~
- A. Vasquez, G. Proni, Lawsone's derivatives: new reagents for fingerprint detection, 12th *Annual Urban University Conference, New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)*, College of Staten Island, NY, May 1-2, 2009~
- L. A. M. Huggins, G. Proni, Comparative analysis of condom lubricants on pre- and post- coital vaginal swabs using AccuTOF-DART, *New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)*, College of Staten Island, NY, May 1-2, 2009*
- L. A. M. Huggins, G. Proni, Comparative analysis of condom lubricants on pre- and post- coital vaginal swabs using AccuTOF-DART *Celebrating student research @ John Jay*, John Jay College, May 7th, 15

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- Y. Rada, G. Proni, Development of new dual research for the detection of latent fingerprints on porous surfaces, *Celebrating student research @ John Jay* - May 7-8, 15 2009*
- M. Valetutti, G. Proni, Index of freshness analysis of tuna sushi and sashimi gathered from New York city markets, *237th ACS National Meeting*, Salt Lake City, UT, March 22-26, 2009*
- G. Proni, D. K. Wilson, E. Champeil, A nuclear magnetic resonance (NMR) based study of urine samples containing drug of abuse: scope and limitations of the technique, *American Academy of Forensic Science (AAFS) 61st*, Denver, CO February 16-21, 2009*
- L. A. M. Huggins, P. J. Diaczuk; G. Proni, Comparative analysis of condom residues pre- and post- coitus by liquid chromatography–mass spectrometry (LC–MS), *American Academy of Forensic Science (AAFS) 61st*, Denver, CO February 16-21, 2009*
- K. L. Tregar, G. Proni, A Review of forensic science programs in the United States, *American Academy of Forensic Science (AAFS) 61st*, Denver, CO February 16-21, 2009*
- M. Szpilowska, G. Proni, Fingerprint worst enemy: AFIX Tracker, *Young Forensic Scientists Forum*, Denver, CO February 16-21, 2009*
- G. Proni, E. Champeil, Assessment of students' likeability of the "clicker" and "Wiley Plus" technologies in organic chemistry, *CUNY IT Conference - 2008* New York, NY December 5th, 2008
- K. Tregar, E. Champeil, G. Proni; A review of the forensic science programs in the United States; Students Demographics, *Northeastern Association of Forensic Scientists NEAFS*, White Plains, NY, USA October 1–4, 2008*
- M. Szpilowska, G. Proni, Analysis of partial fingerprint, *Northeastern Association of Forensic Scientists NEAFS*, White Plains, NY, USA October 1–4, 2008*
- A. G. Petrovic, Y. Chen, G. Pescitelli, M. Roje, M. M. Kayser, G. Proni, N. Berova, CD-sensitive Zn-porphyrin tweezer: MC/OPLS-2005 based computational approach for predicting preferred intraporphyrin helicity of host-guest complexes, *The Southeastern regional meeting of the American Chemical Society, (SERMACS)* Nashville, TN, November 12-15, 2008
- E. Champeil, D. Wilson, G. Proni, Use of NMR spectroscopy for the detection of opioids in human fluids, *236th ACS National Meeting*, Philadelphia, PA, August 17-21, 2008*
- A. G. Petrovic, G. Proni, Y. Chen, G. Pescitelli, N. Berova. Theoretical prediction of molecular recognition of chiral porphyrin-tweezer complexes with secondary amines by OPLS-2005. *ISCD 20 International Symposium on Chirality*, Geneva, Switzerland, July 6-9, 2008
- G. Proni, L. Huang, Y. Ouedraogo, M. D. Plazas-Mayorca, K. Ablin, E. Chadwick, A. G. Petrovic N. Berova, R. J. Wehmschulte, N. Nesnas, Synthesis and chiral recognition of a fish pheromone by CD-sensitive dimeric zinc porphyrin host, *236th ACS National Meeting*, Philadelphia, August 17-21, 2008~
- E. Chadwick, G. Proni, Chiral Recognition of a Fish Pheromone by CD-sensitive dimeric zinc porphyrin host, *Collegiate Science and Technology Entry Program (CSTEP) Statewide Conference 2008*, Sagamore Resort, Lake George, April 4-6, 2008, Third price winner~
- T. McCord, G. Proni, *10th Annual Urban University Conference, New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)*, City College of New York, N.Y. April 27-28, 2008~
- T. M. McCord, A. Canzius, G. Proni, A. G. Petrovic, N. Berova, T. S. Balaban, Configuration determination of a light harvesting porphyrin by circular dichroism tweezer methodology, *ACS Middle Atlantic Regional Meeting (MARM)*, Bayside, Queens, New York, NY May 17-21, 2008~
- E. Chadwick, G. Proni, A. G. Petrovic, N. Berova, L. Huang, Y. Ouedraogo, M. D. Plazas-Mayorca, K. Ablin, R. J. Wehmschulte, N. Nesnas, Absolute configuration determination of a biologically active diol. *ACS Middle Atlantic Regional Meeting (MARM)*, Bayside, Queens, New York, NY May, 17-21, 2008~
- G. Proni, D. Wilson, E. Champeil, Detection of opioids in urine by NMR Spectroscopy. Preliminary studies, *ACS Middle Atlantic Regional Meeting (MARM)*, Bayside, Queens, New York, NY May, 17-21, 2008*
- G. Proni, Y. Chen, A. Petrovic, G. Pescitelli, M. Roje, Nina D. Berova, Chiral recognition by a CD-sensitive dimeric porphyrin host – recent advances in the assignment of absolute configuration. *235th ACS National Meeting*, LA, April 6-10, 2008
- D. Wilson, E; Champeil, G. Proni, Use of ¹H NMR spectroscopy for the study and detection of opioids and their metabolites in urine samples, *Young Forensic Scientists Forum*, Washington, DC, February 18-23, 2008*
- K. Tregar, E. Champeil, G. Proni, A review of forensic science programs in United States: Preliminary findings, *Northeastern Association of Forensic Scientists*, Bolton Landing, NY, USA October 31–3 November, 2007*
- M. Szpilowska, G. Proni, AFIX cost: thousands of dollars. Matching a fingerprint to a suspect: priceless, *Northeastern Association of Forensic Scientists*, Bolton Landing, NY, USA October 31–3 November, 2007*

- R. Baveghems, M. Miller, L. Appesh, G. Proni, J. J. Jackiw, Partial print matching with AFIX Tracker, *Northeastern Association of Forensic Scientists*, Newport, RI, USA 8-13 November 2005~
- Z. Dai, G. Proni, N. Berova, J. W. Canary; Fluorescence-detected circular dichroic detection of metal ions, *227th ACS National Meeting*, Anaheim, CA, March 28–April 1, 2004.
- Z. Dai, G. Proni, D. Mancheno, S. Karimi, N. Berova, J. W. Canary; Detection of metal ions by differential circularly polarized fluorescence excitation, *ISCD 16 – International Symposium on Chirality 2004*, New York, NY, July 11– 14, 2004.
- N. Berova, M. Balaz, M. Giraud, A. Holmes, H. Ishii, H. Matsuda, K. Nakanishi, G. Pescitelli, G. Proni, K. Tanaka; Metalloporphyrin sensors for supramolecular chiral recognition: chiroptical study; Symposium Lecture ICPP-3, *J. Porphyrins Phthalocyanines*, 2004, 8, 347, New Orleans; LA, July 11-16, 2004
- X. Huang, G. Pescitelli, N. Fujioka, G. Proni, K. Nakanishi, N. Berova; Dimeric metalloporphyrin hosts for chiral recognition monitored by circular dichroism; *ISCD 14- International Symposium on Chirality*, Hamburg, Germany, September 8-13, 2002.
- N. Berova, N. Fujioka, X. Huang, K. Nakanishi, G. Pescitelli, G. Proni; Chiral recognition by CD sensitive dimeric metalloporphyrin hosts: chiroptical studies; *ICPP-2, Second International Conference on Porphyrin and Phthalocyanines*; Kyoto TERRSA, Kyoto, Japan, 30 June -5 July 2002.
- N. Fujioka, X. Huang, G. Proni, F. E. Koehn, K. Nakanishi, N. Berova; Application of CD sensitive dimeric zinc porphyrin host for stereochemical analysis; *CD2001, 8th International Conference on Circular Dichroism*; Sendai, Japan, September, 23-28, 2001.
- S. Zahn, G. Proni, J. W. Canary; Electron driven chirality switch potential application to redox-switched cholesteric crystalline phases and data storage materials; *Symposium BB Electrical, Optical, and Magnetic Properties of Organic Solid State Materials V*; Boston, 29 November-3 December 1999.
- G. Gottarelli, G. Proni, G. P. Spada, the chiral self-assembly of guanosine derivatives and the chiral packing of helices in the cholesteric phase; *10th International Symposium on Chiral Discrimination*; Wien, Austria, 30 August - 2 September 1998.
- M. I. Donnoli, G. Proni, C. Rosini, G. P. Spada, S. Superchi, Cholesteric mesophases induced in nematic solvent by *trans*-4,5-diaryl-1,3-dioxolane; *10th International Symposium on Chiral Discrimination*; Wien, Austria, 30 August - 2 September 1998.

Invited Speaker

- Chemistry Department, *Pace University*, New York, NY February 2009
- Chemistry Department, *Queensborough Community College*, Bayside, New York, October 2009
- Chemistry Department, *Bologna University*, Bologna, Italy, July 2010
- Chemistry Department, *Bologna University*, Bologna, Italy, June 2012

Conference Organizer

- 2008** Publication (Program Book) Chair at the Middle Atlantic Regional Meeting ACS 2008 – Bayside, May 17th-21st, 2008

Career Development

- 2008** Workshop Series for Junior Faculty

Three day-long workshop to help male and female junior faculty who are engaged in basic science and engineering at participating CUNY schools.

- 2009** Grant Writing Assistance Program

Semester-long comprehensive Grant Writing Assistance Program for junior female scientist at CUNY.

Curriculum Development

2008 Developed the course “Chemistry is all around us”

The number of individuals qualified to join the Science and Engineering (S&E) workforce has been declining in recent years in United States. In addition, women and minorities have always been notably underrepresented in these fields and the situation is not improving. Several reports have stated that the supply of chemists and other scientists in the near future to the S&E workforce is highly dependent on the K-12 population. Unfortunately, the youth population in the United States does not appear to be particularly interested in pursuing a career in these fields; the situation is even more dramatic in minority communities.

I have developed a course (thanks to a Camille and Henry Dreyfus Foundation grant) in order to increase high school students' exposure to chemistry and expand youth interest in science. I have especially targeted students who are currently underrepresented in the field. It is my opinion that a greater exposure to science in general and to chemistry in particular will make young people more comfortable with these subjects and, as a consequence, the number of individuals who would choose a science career would increase.

The course objectives are: a) to demonstrate how chemistry is relevant to everyday life; b) to explain the new and exciting directions that the science field have taken to solve ecological, health, nutritional problems, and more; c) to channel young people's natural enthusiasm into scientific topics; d) To present chemistry as a possible career choice; e) to provide access to laboratories and equipment and to encourage participation in research projects finalized to improve students' comfort level with chemistry; f) to familiarize students with noteworthy scientists and their achievements (especially from underrepresented backgrounds) to instill a desire in the students to emulate such achievement; g) to develop a new approach to the study of chemistry which would first stress the presence and importance of chemistry phenomena in everyday life, followed by hands-on activity after the natural curiosity of the students has been stimulated; it is then that the chemistry theory behind the concept and the observation would be introduced.

2008 Introduced the “clickers” technology in the Organic Chemistry course

In a class where students use Clickers, students bring the devices (acquired thanks to a John Jay Tech Fee grant) which are slightly larger than a credit card, to their lectures and then respond to questions posed by the instructor. The Clickers work by feeding student responses directly to the professor's computer through radio signals. An advanced software allows the results to be immediately compiled, organized and displayed, which contributes to a livelier, more engaged learning experience for the students. By using Clickers, I quickly gain insight into the level of the students' understanding. I can estimate comprehension and decide whether to review the material or move forward, depending on the class's response.

2007 Introduced Online Homework into the Organic Chemistry Curriculum

Weekly assignments on lecture's material are posted on line. Students can answer their questions and have an immediate feedback about their strengths and weaknesses.

2007 Recorded video-lectures of the Organic Chemistry Course

Videotapes of the Organic Chemistry classes were prepared and posted on-line on the John Jay server; students on their i-pods, computers, etc. can view the video-files in order to review the material.

2005 Developed a Graduate Class in Organic Structural Determination with a Focus in Forensic Topics

This course focuses in discussing spectroscopic techniques used in forensic analysis. All the literature reviewed and the laboratory activities are based on real-cases in the forensic field. The course has become one of the required classes for a Master in Forensic Science in 2009.

Editorial/Review Work

2006-2009 Ad-hoc reviewer for Chirality, Bioorganic and Medicinal Chemistry Letters and Angewandte Chemie International Edition, Belstein Journal of Organic Chemistry, Science and Justice, Journal of Organic Chemistry, Organic Letter.

Grant Activity and Academic Professional Honors

2013 PRISM equipment grant – Jasco J-810 Circular Dichroism Spectrophotometer, \$50000

2010-2013 John Jay College PRISM Support to Research Initiatives \$ 2500 per year

2012 PRISM equipment grant – HPLC attachment \$ 7000

2011-2012 PSC – CUNY Research Award Program
Project's Title: "Lawson's derivatives for fingerprint analysis" – awarded \$2600

2010 Faculty Scholarly Excellence Reward Program, John Jay College, awarded reassigned time

2010-2011 John Jay College Research Assistance Program 2009-2010
Project's Title: "Comparative analysis of condom lubricants on pre- and post- coital vaginal swabs using AccuTOF®-Dart® (Direct Analysis in Real Time" –awarded \$ 2000

2009-2010 John Jay College PRISM Support to Research Initiatives \$ 2000

2009-2010 John Jay College Research Assistance Program 2009-2010
Project's Title: "New reagents for the detection of latent prints" –awarded \$ 750

2009-2011 CUNY Graduate Research Technology Initiative (GRTI)-12 Matching Funds Award
Project's Title: "A New Methodology to Evaluate the Presence and the Chirality of Organophosphorous Compounds" – awarded \$ 9,000

2008-2009 PSC – CUNY Research Award Program
Project's Title: "Isolation and Stereochemical Characterization of Organophosphorous Compounds" – awarded \$3,400

2008-2009 John Jay College Student Technology Fee Program
Project's Title: "When Chemistry Becomes Real" – awarded \$6,000

2008-2009 John Jay College Research Assistance Program 2008-2009
Project's Title: Opioid overdose detected by proton nuclear magnetic resonance (1H-NMR) – awarded \$1,000

2008-2009 Camille and Henry Dreyfus Special Grant Program in the Chemical Sciences
Project's Title: "Chemistry is all around us" – awarded \$35,000

2007 CUNY Sloan Grant 2007-2008
Project's Title: "Developing a hybrid (partially online) organic chemistry course" - awarded \$ 3,000

2007-2008 John Jay College Research Assistance Program 2007-2008
Project's Title: "Partial Print Matching with AFIX Tracker" – awarded \$ 1,000

- 2007-2009** CUNY Graduate Research Technology Initiative (GRTI)-11 Start-up Fund Award
Project's Title: "A New Methodology to Evaluate the Presence and the Chirality of Organophosphorous Compounds" – awarded \$ 20,000
- 2007-2008** John Jay College Student Technology Fee Program
Project's Title: "Clickers Technology Applied to the Organic Chemistry Course" – awarded \$ 5,300
- 2007** John Jay College of Criminal Justice- Teaching Equipment – President's Funds
JEOL 300 MHz Nuclear Magnetic Resonance Spectrometer \$ 165,000
- 2006** John Jay College of Criminal Justice- Teaching Equipment – President's Funds
Jasco High Performance Liquid Chromatography System with Circular Dichroic Detector \$ 65,000
- 2004** American Chemical Society Petroleum Research Fund (ACS-PRF Summer Research Fellowship) in collaboration with Dr. C. Nuckolls (Columbia University) – awarded \$ 8,000
- 2001-2003** Individual National Research Award, National Institute Health, USA
Project Title: Metalloporphyrin hosts in structural studies by CD/FDCC; \$100,000

Departmental and College Services

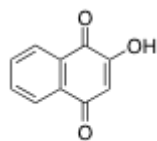
- 2013** Representative of the Search Committee for 2 CLT positions, John Jay College
- 2013** Chair of the "Ad-hoc" Committee for the Development of a Chemistry Major at John Jay College", Science Department, John Jay College.
- 2012** Chair of the Search Committee for the Position of General/Inorganic Chemistry, Science Department, John Jay College
- 2012-present** Faculty Liaison for the Forensic Science Degrees within the CUNY Justice Academy
- 2012** Representative of the Search Committee for the Position of Chief CLT, John Jay College
- 2012-present** Chair of the Science Department Curriculum Committee, John Jay College, Member of the College wide Curriculum Committee in representation of the Department of Science
- 2011-present** Alternate Representative of the CUNY Integrated IRB
- 2009-2011** Representative of the Assessment Committee for the Master Program in Forensic Science, John Jay College.
- 2009** Chair of the "Ad-hoc" Committee for the Development of a Chemistry Major at John Jay College", Science Department, John Jay College.

- 2008-2011** Representative of the John Jay College Council Committee on Honors, Prizes, and Awards.
- 2008-2009** Representative of the John Jay Forensic Science Course Placement Committee (FOS-PCP).
- 2007** Representative of the Forensic Science Education Programs (FEPAC) Accreditation Committee, John Jay College.
- 2007-2009** Representative of the Departmental Curriculum Committee, Science Department, John Jay College.
- 2006-2007** Representative for the Organic Chemistry Course, Forensic Science Partnership Program for the Organic Chemistry Course, John Jay College.
- 2005-2011** Representative of the Institutional Review Board (IRB) Committee, John Jay College.
- 2005 – 2006** Representative of the Departmental Committee for Graduate Admission, Science Department, John Jay College.
- 2005** Representative of the Departmental 5-Year Planning Committee, Science Department, John Jay College.
- 2005-2009** Representative of the Departmental Equipment Committee, Science Department, John Jay College.
- 2004 – 2005** Representative of the Departmental Curriculum Committee, Science Department, John Jay College.

Major Research and Work-Related Experiences *signifies research projects in progress; ~signifies research projects concluded for which a manuscript has been submitted; ^signifies research projects concluded for a which a manuscript will be submitted shortly; +signifies research projects concluded for which a manuscript has been accepted for publication or has been published;

2003 – present Assistant - Associate Professor, John Jay College of Criminal Justice, New York, NY

Synthesizing and investigating the spectroscopic properties of lawsone's analogs, new derivatives to detect latent fingerprints*



lawsone

The main goal of the research project is to prepare new reagents for the detection of latent fingerprints. 2-hydroxy-1,4-naphthoquinone, commonly called lawsone, extracted from the leaves of *Lawsonia inermis* and usually responsible for the staining properties of henna, represents a very promising reagent that combines ease of application with a high sensitivity. The only drawback is its solubility; a high concentration of polar solvents is required to dissolve the molecule that may cause unfavorable ink running on documents.

In the first part of the project, apolar lawsone's derivatives were synthesized. Apolar groups were introduced both on the aromatic portion and the enol functionality. We are currently performing the spectroscopic characterization of the compounds obtained. Fluorescence studies to establish a relationship between the structural features of the lawsone's analogs and their opto-electronic activities are being performed. The mechanism of reaction between lawsone and aminoacids is also being investigated from a computational and experimental point of views.

Developing an NMR strategy for the determination of drug of abuse in urine*

This project aims to determine the feasibility of using NMR spectroscopy to analyze and quantify the amount of opioids in the urine's samples of patients who died for overdose. Initially, an artificial urine was prepared and used in preliminary experiments as a simplified model of real urine. Spectra of morphine, codeine, oxycodone were recorded at different concentrations in artificial urine. Subsequently, real urine samples of not-intoxicated voluntary donors were obtained from the Washington's Medical Examiner office; spiking experiments with the three drugs at different concentrations were recorded. We are, at the present time, analyzing urines from patients deceased for opioids' intoxication. We are also planning, in the future, to analyze mixtures of opioids' metabolites.

Developing a methodology for stereochemical identification of organophosphorous compounds*

The environmental significance of chirality in organophosphorus pesticides (OPs) is currently under intense investigation. All the OPs used in agriculture are applied in their racemic forms but the enantiomers usually differ in their biological activities, and degradation processes and it is of extreme importance to isolate them enantiomerically pure and define their chirality. The goals of the research project are to isolate the enantiomers of a racemic couple of several chiral OPs, to characterize them spectroscopically (optical rotation, circular dichroism) and to apply a general and microscale method based on a liquid crystal (LC) approach to determine their absolute configuration. The LC technique is based on the cholesteric induction phenomenon. This technique has been previously used to detect minuscule quantities of chiral compounds of different chemical structures and/or of low optical activity and to determine their absolute configuration but it has never been applied to organophosphate compounds. Moreover, vibrational circular dichroism studies are being performed as a complementary technique to determine the absolute configuration of the compounds under examination.

Evaluating of the capability of the AFIX tracker program to determine partial fingerprints and palm prints^

The performances of AFIX Tracker®, a minutia-based fingerprint identification system developed by AFIX Technologies, were established to search 1000 rolled prints against a database of pressed fingerprints. In the analysis, the minutiae were extracted manually or with the help of the Smart Extract feature, included in the software package. It was found that a manual extraction of minutiae is highly more preferable to the automatic feature in order to have high values of fingerprint identification. Moreover, the quality of the prints and their sizes was found to be the limiting step. Because full fingerprints of reliable quality are not always found at a crime scene, the partial prints of different dimensions were also analyzed. It was found that area of fingerprints up to 1 cm² could be easily identified by the system.

The same approach is also used to analyze palm prints and their minutiae.

Determining the freshness of the tuna fish used for sushi and sashimi in New York City's stores/markets*

In a city like New York the consumption of raw fish in the form of sushi is dramatically high. To be able to determine the quality of the fish on the market and more precisely its freshness is of paramount importance. This research project aimed to determine the approximate age of raw tuna obtained from several restaurants and grocery in the Manhattan area. Six different sushi restaurants and grocery stores have been used as the source for raw fish. It is known that ATP (adenosine 5-triphosphate) in the fishes' muscle breaks down into five other compounds, ADP (adenosine 5'-diphosphate), AMP (adenosine 5'-monophosphate), IMP (inosine 5'-monophosphate), inosine and hypoxanthine. In particular, after 1-3 days the majority of ATP has already been converted to IMP and then IMP slowly converts into Ino and the Hx. The amount of ATP, ADP, AMP, IMP, hypoxanthine and inosine was determined by reverse-phase HPLC and the index of freshness was calculated accordingly to the equations. The same type of investigation is currently being performed analyzing the amounts of amines produced during the fish degradation.

Reviewed the status of the forensic science programs in the United States+

Over the last 30 years, the number of institutions offering forensic science higher education programs in the US has increased from 21 to 120. However, despite an increase in student interest and program availability, there has been a consistent reluctance to hire individuals with degrees in forensic science. This is due in part to a lack of information available about these programs, in terms of course offerings, equipment available to students, degree or certificate requirements, and other important aspects of the programs. Additionally, while accreditation by the Forensic Science Education Programs Accreditation Commission (FEPAC) ensures adherence to certain standards, it is not required. As a result, it is possible for the curriculum of forensic science higher education programs to vary considerably.

To obtain an understanding of the variance observed in forensic science higher education programs and their course offerings and requirements, the existing academic Forensic Science programs in the United States were surveyed. The survey requested information regarding the number of courses, subject inclusion, pre-requisites, degree requirements, available instrumental and academic resources, and experience, degree level, and participation of faculty. It was found that, of the responding institutions, relatively few of them are FEPAC accredited, although most intend to apply or have applied for accreditation. It was also observed that, in general, the responding programs vary considerably in terms of their size and subject coverage.

Determined the absolute configuration of β -lactams using a host/guest recognition methodology+

β -lactams are one of the most extensively investigated heterocyclic ring systems as a result of both their

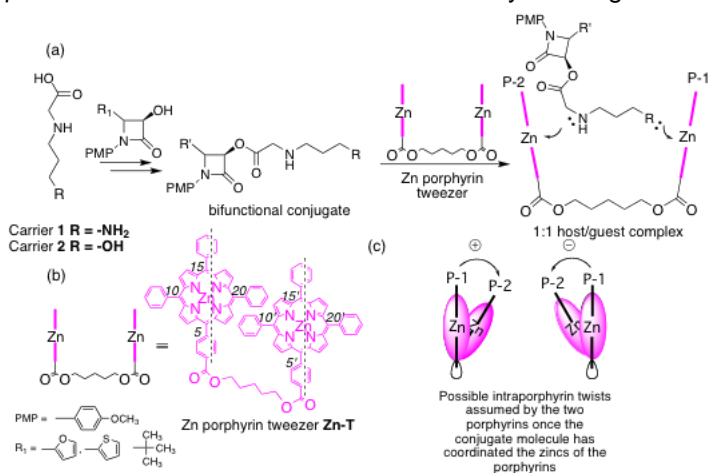


Figure 1. Formation of the 1:1 complex between a conjugate molecule derived by the β -lactam molecule and tweezer molecule Zn-T and schematic representation of the possible conformations adopted by the porphyrins.

biological activity as antibiotics and their use as precursors of more complex pharmacologically important substrates. In addition, β -lactams with a defined stereochemistry represent important synthetic targets as a number of biologically active compounds contain a stereo-defined β -lactam moiety. This project represented the first attempt to the application of the exciton-coupled circular dichroism (CD) method based on chiral recognition by dimeric zinc porphyrin host (tweezer) to this class of compounds. With respect to other techniques, the bis-porphyrin tweezers methodology has the advantage of requiring only a minute amount (down to mg) of the chiral substrate. The approach involves a host-guest complexation between a dimeric porphyrin derivative, the zinc tweezers, Zn-T, acting as a host, and opportunely derivatized

substrates (in the current case, 3-hydroxy- β -lactams) as guest molecules. Once the complexation has taken place, the porphyrins in the complex adopt a preferred mutual chiral arrangement, which is dictated ultimately by the absolute configuration of the substrate. The sign (and the amplitude) of the twist between the two porphyrins is reflected in the CD signals in the Soret region of absorption. Thus, from the sign of the experimentally observed CD couplet, it is possible to determine the inter-porphyrin twist and hence the absolute configuration of the chiral substrate. The overall goal of the project was to be able to determine the absolute configuration of β -lactam units by means of the supramolecular methodology.

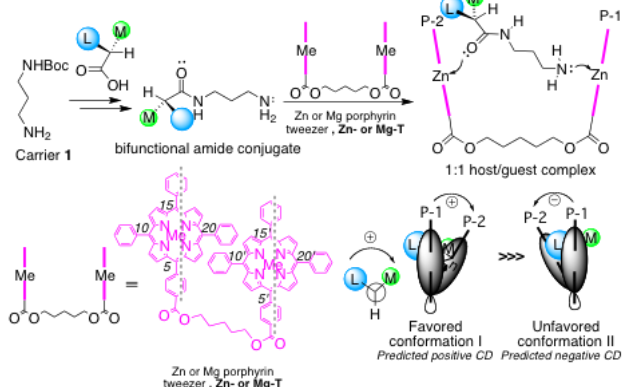
Developed a strategy to evaluate DNA conformational variations in the 400-500 nm region+

CD signals in the 200-300 nm region are widely used to investigate DNA conformational variations. Its use is largely empirical, and comparisons are often made with CD spectra already measured for nucleic acids of known conformation. The CD spectra of nucleic acids in the 200-300 nm region are due mainly to exciton coupled-oscillator interactions between the electronic moments of the nucleobases. The conformational changes upon chemical modifications either in the bases, in the sugar, and in the phosphate moiety of the oligonucleotide, or upon drug-DNA binding remain difficult to analyze, particularly when subtle changes in the overall conformation of the oligonucleotide are involved. It was developed a strategy that allowed the detection of variations in the secondary structure of DNA sequences (double strand to single strand transition) by exciton coupled CD experiments in a red-shifted absorbing region (Soret band of the porphyrin moiety),

thus avoiding overlaps with pre-existing chromophores. This was achieved thanks to the synthesis of a complementary AT sequence derivatized with a porphyrin moiety. The two porphyrin residues, interacting through space, give rise to CD signals that monitor the double strand - single strand transition.

2001-2003 NIH funded post-doctoral fellow, Columbia University, New York, NY

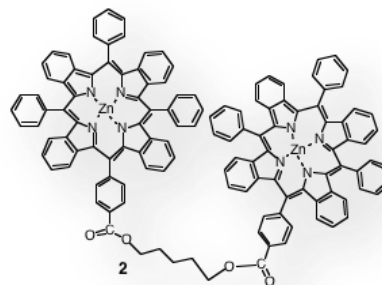
Developed a strategy for absolute stereochemical determination of chiral carboxylic acids based on a host/guest recognition methodology+



A general chiroptical protocol for the determination of the absolute configuration of chiral carboxylic acids including cyclic, acyclic, aromatic derivatives and natural products with complex structures was achieved. The chiral substrates, derivatized with an achiral carrier molecule derived from propanediamine, yields a bidentate conjugate, capable of forming a 1:1 host/guest complex with metallated (zinc or magnesium) dimeric zinc porphyrin molecules, Zn-T and Mg-T. The complexation mechanism represents a stereodifferentiating process which leads to formation of a host/guest complex with a preferred

porphyrin helicity that exhibits intense exciton split CD spectra. It was found that for compounds devoid of oxygen functionalities at the chiral center, the sign of the interporphyrin twist is determined by the absolute configuration of the substrates and, in particular, based on the steric sizes of the substituents at the chiral center; In case of compounds carrying oxygen groups, conformational factors govern the sign of the intraporphyrin twist. NMR and molecular modeling studies were performed to characterize the complex's structure.

Synthesized tetrabenzoporphyrin's derivatives, determined their spectroscopic properties and their application to the tweezer host-guest recognition methodology+



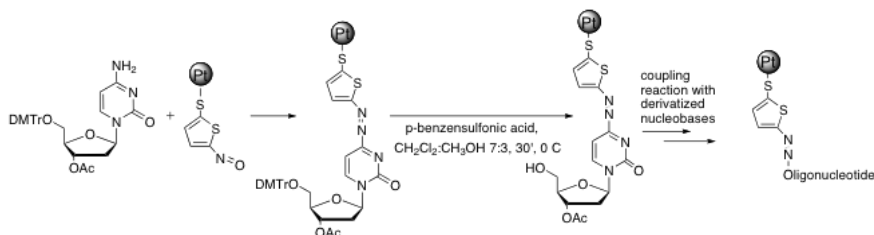
In order to extend the host-guest complexation mechanism, through fluorescence detected circular dichroism studies (FD CD), down to a nanoscale level, the synthesis of new porphyrin tweezer molecules based on the tetrabenzoporphyrin unit was achieved. Porphyrins obtained were proved to exhibit intense UV-Vis absorptions, a narrow Soret band and high fluorescence quantum yields, especially in their Mg^{2+} derivatives. These new derivatives, applied to host/guest complexation studies, showed good binding properties with compounds of different nature such as carboxylic acids and secondary amines.

2000 Post-Doctoral Research Scientist, New York University, New York, NY

Prepared oligonucleotides from D- and L-nucleotides building blocks and characterized their chiroptical properties

Oligonucleotides of different lengths and with different D- and L- (opposite chirality nucleotides) ratio were synthesized in order to study their effect on the overall oligonucleotides' chirality. Interestingly, a series of four L-nucleotides in a $(AT)_6$ chain shows an inversion from right-handed to left-handed of the chirality of the helix. The inversion of chirality was followed by CD spectroscopy.

Prepared and characterized an oligonucleotide-platinum nanoparticle conjugate for hybridization studies



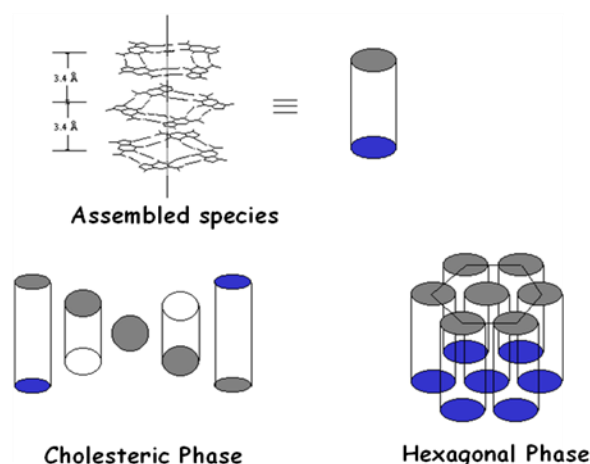
A DNA-nanoparticle conjugate that could be used to for

hybridization studies was prepared. Because the platinum nanoparticles are in the form of a suspension they could be derivatized and purified after each reaction easily. Moreover, because of their antioxidant properties, platinum nanoparticles are the subjects of substantial research with applications in a wide variety of areas, including nanotechnology, medicine and the synthesis of novel materials with unique properties.

1997-1998 Visiting Scholar, New York University, New York, NY

Studied an HMG-B (chromosomal protein) domain mutant

The high-mobility-group B (HMG-B) chromosomal proteins are characterized by the HMG box, a DNA-binding domain that both introduces a tight bend into DNA. Common properties of HMG domain proteins include interaction with the minor groove of the DNA helix, binding to irregular DNA structures, and the capacity to modulate DNA structure by bending. DNA bending induced by the HMG domain can facilitate the formation of higher-order nucleoprotein complexes, suggesting that HMG domain proteins may have an architectural role in assembling such complexes. A mutant of the HMG-B domain was prepared and binding studies between the native HMG-B domain, its mutant and four-stranded forming oligonucleotides were performed. The goal of this research was to understand if the B-domain had any affinity for four stranded helices. Moreover, binding studies between the native protein and ribosomal and transfer RNA were performed.



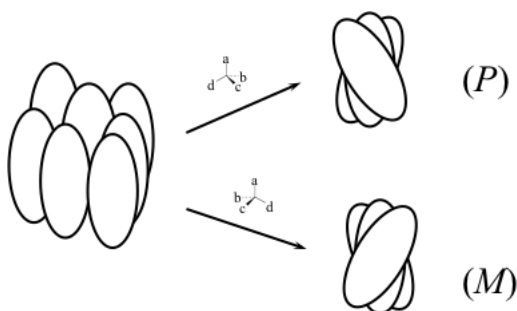
1995-2000 Graduate Research Assistant, University of Bologna, Italy

Studied the self-assembly and liquid crystal formation of telomeric-like sequences+

Both B-DNA and G-based oligonucleotides, dissolved in water, can form cholesteric and hexagonal liquid crystalline phases. While for B-DNA the building blocks of the liquid crystalline phases are right-handed double helices, in the case of guanosine rich oligonucleotides, the building blocks are self assembled columnar structures (b) based on G-quartets (a) commonly referred as G-wires. Oligodeoxyguanilates $d(G_2)$, $d(G_3)$, $d(G_4)$ and

$d(G_6)$ aggregate in isotropic solution to give right-handed four stranded helices; on the other hand deoxyguanosinemonophosphates form left handed four-stranded helices. These structural assignments were based on CD studies. While B-DNA gives a left-handed cholesteric phase at room temperature, the cholesteric phases formed by oligoguanilates with $G \geq 2$ are right handed. The cholesteric phase formed by monoguanilates derivatives are left-handed. Again, the configurational assignments of the helicity of the cholesteric phases were based on CD data. While the right handed helices for G-based derivatives aggregate to form right handed cholesteric phase, the cholesteric phase formed by B-DNA (right-handed) helix is left-handed. This apparent discrepancy was overcome by considering temperature variations of the parameters of the cholesteric phase.

The cholesteric induction methodology (a liquid crystal technology) to detect chiral molecules of different structure+



A systematic study of the cholesteric induction in nematic solvents of several compounds of different structure such as cyclic derivatives of unsubstituted and p,p' -disubstituted-1,2-diphenylethane-1,2-diols, helicenes, 1,1'-binaphthyl, dioxolanes and 4,4'-biphenanthryl derivatives were investigated.

When a helical organization (cholesteric induction) is induced in an achiral liquid crystalline host by addition of a small chiral molecule, the chirality of the dopant is overall amplified

generating a large change in the optical and structural properties; conformational and configurational studies of the molecules under examination were performed studying the cholesteric phases and their parameters.

Students Advised

Graduate Students

- 2013-** Ms. Monica Defalco – graduate student (MS Forensic Science) –
Thesis Project: "Development of new reagents for the detection of latent fingerprints on porous surfaces"
- 2013-** Ms. Alicia Ocana – graduate student (MS Forensic Science) –
Thesis Project: "Development of new reagents for the detection of latent fingerprints on porous surfaces"
- 2013-** Ms. Anita Ng – graduate student (MS Forensic Science) –
Thesis Project: " Absolute configuration determination of organophosphorous insecticides"
- 2010-present** Ms. Amanda Vasquez – graduate student (MS Forensic Science) - *New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)* award recipient Fall 2010-Spring 2012
John Jay College Forensic Science Award Recipient 2010-2012
Thesis Project: "Development of new reagents for the detection of latent fingerprints on porous surfaces"
- 2008-2012** Ms. Lesley Ann Huggings – graduate student (MS Forensic Science) – graduated Fall 2011 - *New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)* award recipient Spring and Fall 2009, Spring and Fall 2010, Spring and Fall 2011
Thesis Project: "Comparative analysis of condom lubricants on pre- and post- coital vaginal swabs using AccuTOF®-Dart® (Direct Analysis in Real Time)"
- 2007-2011** Ms. Laura Deimel – graduate student (MS Forensic Science) - graduated Summer 2011
Thesis Project: "Palm print minutiae analysis by AFIX® Tracker"
- 2009-2011** Ms. Yvette Rada – graduate student (MS Forensic Science) – graduated Summer 2011
Thesis Project: "Development of new reagents for the detection of latent fingerprints on porous surfaces"
- 2007-2009** Ms. Marta Szpilowska – MS in Forensic Science – graduated Summer 2009
Thesis Project: "Identification of full and partial prints using the AFIX Tracker® identification system".
- 2007-2008** Ms. Kristen Tregar – MS in Forensic Science - graduated Summer 2008
Thesis project: "A review of forensic science higher education programs in the United States"
- 2007-2008** Ms. Donna K. Wilson – MS in Forensic Science - graduated Summer 2008
Thesis project: "A study of the use of nuclear magnetic resonance spectroscopy in the analysis of opioids and opioid metabolites in artificial urine"
- 2008** Mr. Michael Valetutti – MS in Forensic Science – graduated Fall 2008
Thesis Project: "Analysis of ATP derivatives to determine the age of raw fish in the New York City area using high performance liquid chromatography"

Undergraduate Students

- 2013-** Ms. Kristi Tami – expected graduation Spring 2013 -
Research Project: " Absolute configuration determination of organophosphorous insecticides"
- 2013-** Ms. Melian Chen– expected graduation Spring 2014 -
Research Project: " Absolute configuration determination of organophosphorous insecticides"
- 2010-present** Mr. Irving Campoverde – graduated Spring 2012 - *Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient Fall 2010, Spring 2011, Spring 2012.
Research Project: " A study of the use of nuclear magnetic resonance spectroscopy in the analysis of opioids and opioid metabolites in artificial urine"
- 2010-2012** Mr. James Field - graduated Spring 2012 - *Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient Fall 2010, 2011, and Spring 2012
Research Project: "Analysis of ATP and amines derivatives to determine the biochemical age of raw fish"
- 2009-present** Ms. Roselynn Cordero - graduated Spring 2012 - *New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)* award recipient Fall 2009 and Spring/Fall 2010, Spring 2011, *Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient in the 2009, 2010, 2011, and Spring 2012
Research Project: "Studies of diamines and secondary alcohols by CD-sensitive dimeric porphyrin hosts"
American Chemical Society - IREU Summer Research Project award winner
PRISM Outstanding Undergraduate Research Award 2011 - runner up position
PRISM Outstanding Undergraduate Research Award 2012
- 2010-2011** Ms. Natasha Dalton - expected graduation spring 2013 - *Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient starting from Fall 2010 and Spring 2011
Research Project: "Absolute configurational assignment of a self assembling light harvesting porphyrin using the tweezer approach"
- 2012-present** Ms. Andrea Saenz – graduated spring 2012 – *Program for Research Initiative for Science Majors (PRISM)* fellowship recipient for Fall 2010 and Spring 2011
Research Project: "Supramolecular self-assembly of porphyrin-guanosine derivatives"
- 2010-2011** Ms. Tali Klepfitz – graduated Spring 2011 –
Research Project: "Identification of full and partial prints using the AFIX Tracker® identification system"
- 2010-2011** Ms. Sade Solomon – graduated Spring 2011 -
Research Project: " Absolute configuration determination of organophosphorous insecticides"
- 2010-present** Ms. Paola Estrada – graduated Spring 2011 -
Research Project: " Absolute configuration determination of organophosphorous insecticides"
- 2008-2010** Ms. Amanda Vasquez – graduated spring 2010 – currently Master Student in the Forensic Science Program, John Jay College
New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP) award recipient Fall 2008- Spring and Fall 2009, Spring 2010, PRISM fellowship recipient in the same semesters
John Jay College Undergraduate Research Scholarship 2008
Patricia Cornwell Scholarship, 2009
Jerome Metzner Award in Forensic Science 2010
PRISM Outstanding Undergraduate Research Award
Research Project: "Development of new reagents for the detection of latent fingerprints on porous surfaces"

- 2008-2009** Ms. Alicia Canzius - *ndergraduate Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient in 2008 – 2009
 Research Project: "Configuration determination of a light harvesting porphyrin by circular dichroism tweezer methodology"
 John Jay College Undergraduate Research Scholarship Winner, 2008
 Distinguished Service Award, John Jay College, 2009
- 2008-2009** Ms. Anastasia Popova, - graduated Spring 2009 –
 Develop laboratories for the "Chemistry is all around us" project, funded by the Camille and Henry Dreyfus Foundation
 Anne Schreiber Memorial Award, John Jay College, 2009
- 2007-2008** Mr. Troy McCord – graduated Spring 2008 - *New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP)* award recipient Spring 2008
 Research Project: "Configuration determination of a light harvesting porphyrin by circular dichroism tweezer methodology"
- 2007-2008** Ms. Ekaterina Chadwick - pre-med student - undergraduate *Program for Research Initiatives for Science Majors (PRISM)* fellowship recipient in 2007-2008
 Research Project: "Chiral Recognition of a Fish Pheromone by CD-sensitive dimeric zinc porphyrin host"
Collegiate Science and Technology Entry Program (CSTEP) Statewide Conference 2008, Sagamore Resort, Lake George, April 4th-6th 2008, Third Price winner
- 2005** Ms. Rhonda Baveghems, Ms. Meghan Miller - graduated Spring 2005

Research Advisor of other research students for the course FOS402 (Research Internship)/FOS 401 (Extramural/Research Internship) during the academic years 2005-2007-2008-2009:
 Mr. Craig Mare, Mr. Nathaniel Query, Mr. Thomas Verdino, Mr. Edward Kovacs III,

Membership in professional societies

2001-present American Chemical Society

Service to larger community

2008-present "Chemistry is all around us"

I am working with public middle and high schools of the New York city area to design and implements a curriculum that will include chemistry of everyday life. I have partnered with CSTEP program and COLLEGE NOW to recruit middle and high school students interested in trying the curriculum. Some high school teacher training was also accomplished.