Curriculum Vitae

Dalice M. PIÑERO CRUZ, Ph.D.

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Professional Background

January 2014 – Present	**Assistant Professor of Chemistry,** University of Puerto Rico, Río Piedras Campus *Projects: i) Molecular Magnets and Nanomaterials for applications in memory devices following a Rotationally-Oriented Ligand Design (ROLD) approach* *ii) Synthesis of Novel Non-toxic Magnetic Resonance Imaging Contrast Agents from protected Metallo-dithiolenes.*
2011 – 2012	**Researcher – Adjunct Assistant Professor**, University of Bordeaux, Centre de Recherche Paul Pascal. *Project: Synthesis of new polyamine based Single Molecule Magnets*
2010 – 2011	**CNRS Postdoctoral Fellow,** (CNRS - Centre National de la Recherche Scientifique), Institut de Sciences Chimiques de Rennes. *Project : Complexes dithioléne comme métallo-ligands*
2009 - 2010	**CNRS Postdoctoral Fellow,** CNRS, Institut de Chimie de la Matière Condensée, Pessac. *Project : Multi-Shell coordination magnetic nanoparticles*
2008; 2009	**Invited Researcher**, Institute of Material Science, Demokritos, Greece. Visits financed by an award from the National Science Foundation (NSF). *Project: Mössbauer Spectroscopic Studies of Redox-Active Fe_4O_4-Cubanes*
2008	**Invited Researcher**, Radiation Laboratory, Univ. Notre Dame, Indiana, USA. *Project: Mechanistic and energetic aspects of the thermal and photochemical redox chemistry of the octanuclear cubane complexes, $Fe^{III}_8(\mu_4\text{-}O_4)(pyrazolate)_{12}X_4$*

Education

Aug. 2002 – Feb. 2009	**Ph. D.** from the University of Puerto Rico, Río Piedras Campus, Puerto Rico, USA <Master + Ph.D. Program> Thesis subject: "*Coordination Chemistry of Fe-Pyrazole/ate Complexes Based on the Study of their Structural, Electrochemical, Magnetic and Spectroscopic Properties"* Thesis supervisor: Raphael G. Raptis
Aug. 1997 – May 2001	**BS** in Natural Sciences from the University of Puerto Rico, Río Piedras Campus, Puerto Rico, USA

Languages: Spanish (mother tongue), English (bilingual), French (fluent)

Publications

P.1) D. Piñero; P. Baran; R. Boca; R. Herchel; M. Klein; R. G. Raptis; F. Renz; Y. Sanakis, "**A pyrazolate-supported $Fe_3(\mu_3$-O)- core; structural, spectroscopic, electrochemical and magnetic study**" Inorg. Chem. **2007**, 46, 10981-10989.

P.2) G. Ferraudi; D. Piñero; I. Chakraborty; R. G. Raptis; A. G. Lappin; N. Berlin, "**Mechanistic and energetic aspects of the thermal and photochemical redox chemistry of the octanuclear cubane complexes, $Fe^{III}_8(\mu_4$-$O_4)$(pyrazolate)$_{12}X_4$ (X = Cl or Br)**" J. Phys. Chem. A **2010**, 114, 5702-5709.

P.3) E. M. Zueva; W. M. C. Sameera; D. Piñero; I. Chakraborty; E. Devlin; P. Baran; K. Lebruskova; Y. Sanakis; J. E. McGrady; R. G. Raptis, "**Experimental and theoretical Mössbauer study of an extended family of $[Fe_8(\mu_4$-$O)_4(\mu$-4-R-pz$)_{12}X_4]$ clusters**" Inorg. Chem. **2011**, *50*, 1021-1029.

P.4) A. Famengo; D. Piñero; O. Jeannin; T. Guizouarn; L. Piekara-Sady; M. Fourmigué "**Dithiolene complexes as metallo-ligands: a crown-ether approach"** New J. Chem., **2012**, *36*, 638–643.

P.5) A. Famengo; D. Piñero; O. Jeannin; T. Guizouarn*;* M. Fourmigué, ''**Paramagnetic dithiolene complexes as metallo-ligands: ether/thioether coordination''** *Dalton Trans.*, **2012**, *41*, 1441–1443.

P.6) W. M. C. Sameera; D. Piñero; R. Herchel; Y. Sanakis; J. E. McGrady; R. G. Raptis; E. M. Zueva, **A combined experimental and computational study of the magnetic superexchange within a trinuclear (μ_3-O)-pyrazolato-Fe^{III}_3 complex** *Eur. J. Inorg. Chem.,* **2012**, 3500–3506.

P.7) E. V. Govor; I. Chakraborty; D. Piñero; P. Baran; Y. Sanakis; R. G. Raptis, "**Structural and ^{57}Fe-Mössbauer characterization of mononuclear ferrous and ferric pyrazole complexes"** *Polyhedron, **2012**, 45, 55-60.*

P.8) I.-R. Jeon; S. Calancea; A. Panja; D. Piñero; P. Dechambenoit; C. Coulon; A. Wattiaux; P. Rosa; C. Mathonière; R. Clérac, "**Spin crossover or intra-molecular electron transfer in a cyanido-bridged Fe/Co dinuclear dumbbell: a matter of state**" *Chem. Sci*., **2013**, *4*, 2463-2470.

P.9) S. Calancea, D. Piñero, D. Poirot, C. Mathonière, P. Rosa, R. Clérac, R. Gonzalez-Hartje, R. Chiozzone, C. Pejo, F. Lloret, "**Structural and magnetic characterization of new complexes from the pyCOpyCOpy ligand**" *Polyhedron,* **2013**, *64*, 294-303.

P.10) D. Piñero, D. N. Woodruff, I. Jeon, I. Bhowmick, M. Secu, E. A. Hillard, P. Dechambenoit, R Clérac, "**Switching off the SMM properties of the $[(Co^{II}(Me_6TREN)(OH_2)]^{2+}$ module by complexation with *trans*-$[Ru^{III}$(salen)$(CN)_2]^-$ "** *New J. Chem.,* **2014***, 38,* 3443-3448.

*P.11) **A.** Cruz-Montañez, D. Piñero, J. A. Prieto "**Crystal structure of (-)-(2R,3S,4R,5R)-5-(1,3-dithian-2-yl)-3-methyl-1-(triisopropylsilyloxy)hexane-2,4-diol"**, .Acta Cryst. Sec. E, **2014**, E70, o1285–o1286.*

*P12) K. Morales-Rivera, K. D. Piñero, J. A. Prieto, J. A. "**Crystal structure of (−)-(S)-4-[(2S,3S,4S,Z)-3-hydroxy-4-methylhept-5-en-2-yl]-1,3-dioxolan-2-one"**, Acta Cryst. Sec. E, **2017**, E73, 1070–1072.*

*P13) K. Gutierrez, J. Corchado, S. Lin, Z. Chen, D. Piñero, **"A Non-innocent Salen Naphthalene Ligand and its Co^{2+}, $Ni^{2+}$and Cu^{2+} Metal Complexes: DFT, Structural, Electrochemical and Spectroscopic Characterization**", Inorganica Chimica Acta, **2018**, 474, 118–127.*

Related Scientific Contributions

- **Participated actively in the editing of research project proposals in English, Spanish and French**
- **Edited more than 20 external publications from colleagues in the fields of Chemistry, Physics and Mathematics**
- **Created a Module on Scientific Writing**

Selected Oral Communications and Workshops

OC.1) "**Iron-Pyrazolate Chemistry: Tuning of Magnetic and Electrochemical Properties by Pyrazole Substitution**" 235rd ACS Spring National Meeting, New Orleans, USA, **2008**.

OC.2) "**Determination of Redox Centers in Iron-Pyrazolato Complexes through the Application of Mössbauer Spectroscopy**" 32nd Senior Technical Meeting, Rincón, PR, **2008**.

OC.3) "**Designing New Paramagnetic Complexes for their Future Application in Memory Devices, Theranostics and Sensors"** Presented at UPR-Cayey, UPR-Humacao, UPR-Mayaguez, and UPR Carolina, **2015**.

OC.4) "**How Acid Base Concepts Can Help us Design New MRI Contrast Agents that can be used in PhotoThermal Therapy to fight Cancer"**. Invited speaker, Simposio de Ciencia-UPR Carolina, **2016**.

OC.5) **"Tailoring new cyanide linked 3d and 3d-4f metal complexes from common amine based ligands"**. Invited speaker, Simposio de Cristalografía de PRCHEM **2014** organized by the Colegio de Químicos de Puerto Rico.

OC.6) **Searching for Good Postdoc Opportunities…Do's and Don'ts in the process**. Presented to the RISE and MARC students from UPR-RP

OC.7) "**Mono and di-nuclear complexes from salen based-ligands as building blocks for new polynuclear complexes"** Presenter and moderator at the 256 ACS Fall National Meeting and Exhibition, Boston, USA, August **2018**.

OC.8) "**Famous Families of Metal Complexes and their implication in Materials Sciences, Environmental Nanotechnology, and Nanomedicine",** Invited Talk presented at UPR-Cayey on November, **2018.**

OC.9) **"Cómo seleccionar y solicitar exitosamente a internados de verano",** Presented to the RISE and MARC students from UPR-RP, November **2018**.

W.1) 2nd Workshop on Current trends in Nanoscopic and Mesoscopic Magnetism, Delphi, Grèce, **2008**.

W.2) **"A crystallographic view on tailoring new cyanide linked 3d and 3d-4f metal complexes from common amine based ligands".** Invited speaker at the Crystallography Symposium as part of the 73rd Conference and Exhibition of the PR Chem 2014 organized by the Colegio de Químicos de Puerto Rico, **2014**.

W.3) Course of Continued Education to the Colegio de Químicos de Puerto Rico**.** X**-ray Diffraction Analysis for the characterization of Crystalline Solids**, **2018** PRCHEM, 3 hours' workshop.

Selected Posters at International Conferences

Po.1) "***The Pyrazolate / Carboxylate Structural Parallel Tough the Study of*** $[Fe_3(\mu_3\text{-}O)(4\text{-}NO_2\text{-}pz)_6X_3]^{2-}$***, X = Cl, Br***" International Coordination Chemistry Conference of the American Chemical Society", Mérida, Mexico, **2004**.

Po.2) "***Characterization of Iron Pyrazolates: Pyrazolate / Carboxylate Structural Parallel***" 7th European Biological Inorganic Chemistry Conference, Garmisch-Partenkirchen, Germany, **2004**.

Po.3) ***"Role of Pyrazole Substitution on Redox Active*** Fe_4O_4***-Pyrazole Clusters***" 8th European Biological Inorganic Chemistry Conference, Aveiro, Portugal, **2006**.

Po.4) ***"The Role of Pyrazole Substitution (R) Versus Terminal Ligands (L) Exchange in the Voltammetric Properties of*** $Fe_8(\mu_4\text{-}O)_4(\mu\text{-}4\text{-}R\text{-}Pyrazolate)_{12}L_4$ ***Complexes***" **2007** MGE@MSA Arizona Student Research Conference, Tempe, AR, USA.

Po.5)***"Nickel Dithioléne Complexes as Metallo-Ligands"*** Journées de Chimie de Coordination de la Société Chimique de France, Angers, France, **2011**.

Po.6) ***''Paramagnetic Nickel Bis(Dithiolene) Metallo-Ligands: Structural and Magnetic Properties of 0D and 1D Bimetallic Systems''*** **2011 Young PR Scientist award**, 43rd IUPAC World Chemistry Congress, Puerto Rico, USA.

Po.7) *"**Tailoring new cyanido bridged 3d and 3d-4d metal complexes"*** Vth International Conference on Molecular Materials. MOLMAT 2012, Barcelona, July **2012**.

Funding and Awards

F.1) NSF REU CHE-1560278, **2016-2018**, **200K, funds for student training. Project: PR-CLIMB (Puerto Rico-Chemical Learning in Materials and Biomolecular applications). Co-PI for one year.**

F.2) NSF-MRI CHE 1626103**. 2016-2019, 348K Acquisition of a Single Crystal X-ray Diffraction Instrument for the Creation of an X-ray Diffraction Facility at the University of Puerto Rico. PI**

F.3) Institute of Functionalized Nanomaterials/Epscore/NSF Startup Funds, **2015-2017**, **200K/2years. Project: Multimodal theranostic nanoprobes for non-invasive bioimaging and photothermal therapy. PI**

F.4) UPR Research Institutional Funds (FIPI), **2014-2016, 10K/year. Project: "Development of Molecular Magnets and Nanomaterials for applications in memory devices following a Rotationally-Oriented Ligand Design (ROLD) approach". PI**

F.5) NSF IRES/DDEP 0827841, **2008, 11K, Project: U.S-Greece Dissertation Enhancement: Mössbauer Spectroscopic Studies of Redox-Active Fe_4O_4-Cubanes**.

A.1) CNRS (Centre de la Recherche Scientifique, France) Postdoctoral Fellowship, Institut de Sciences Chimiques de Rennes. Project: **Complexes dithioléne comme métallo-ligands (2010-2011)**.

A.2) CNRS Postdoctoral Fellowship, CNRS, Institut de Chimie de la Matière Condensée, Pessac. Project: **Multi-Shell coordination magnetic nanoparticles (2009-2010)**.

A.3) NIH-RISE Doctoral Scholarship 2-R25-GM6-1151 (2006-2008).

A.4) Department of Chemistry, University of Puerto Rico, GRADUATE ASSISTANCE IN AREAS OF NATIONAL NEED (GAANN) Doctoral Scholarship P200A030197-05 (2003-2006).

A.5) 2011 Young PR Scientist Award, 43rd IUPAC World Chemistry Congress, Puerto Rico, USA.

A.6) Awarded 3rd place at the Doctoral Poster Presentation of the 2007 MGE@MSA Arizona Student Research Conference.

Teaching Experience

University of Puerto Rico, Río Piedras Campus
Instrumental Analysis Laboratory; General Chemistry II, Laboratory of Inorganic Chemistry, Advanced Inorganic chemistry II (graduate course), Crystallography (graduate course)

University of Bordeaux, France
Organic chemistry; General Physical Chemistry: Discussion and Laboratory; Analytical Chemistry - Chemistry of equilibriums; Analytical Chemistry - Electrochemistry; Physical chemistry - Thermodynamics: Discussion and Laboratory