

Curriculum Vitae

LILIANA QUINTANAR

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Education

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
UNAM (National University of Mexico), Mexico, D.F.	B.S.	1993-1998	Chemistry (Advisor: Ignacio Camacho)
University of California, Santa Barbara, CA	Exchange program	1996-1997	Chemistry (Advisor: Stanley Parsons)
Stanford University, Stanford, CA	Ph.D.	1998-2004	Chemistry (Advisor: Edward Solomon)

A. Personal Statement. My research group focuses in the study of metal-protein interactions that are relevant in different neurodegenerative and degenerative diseases. We use an array of spectroscopic techniques to study metal ion binding to proteins or peptides that aggregate and form amyloid structures, such as beta-amyloid peptide, alpha-synuclein, amylin and prion protein fragments. In particular, we are interested in copper binding to these proteins, as such copper-protein complexes can display interesting redox activity, which in turn may impact protein structure, folding and aggregation. Recently, we have become interested on studying the role of metal ions in the non-amyloid aggregation of lens crystallin proteins, a process associated to cataract pathology.

B. Positions and Honors

Positions and Employment

2011-present; Professor, Departamento de Química, Cinvestav, México
2005-2011; Assistant Professor, Departamento de Química, Cinvestav, México
2005 Postdoctoral fellow, Instituto de Fisiología Celular, UNAM, Mexico

Recent Awards

2016 Cátedra Marcos Moshinsky (Award to Young Scientist) in Chemistry and Biology
2014-2015 Fulbright – García Robles Fellowship to perform sabbatical research in the group of Prof. Jonathan A. King at the Massachusetts Institute of Technology (MIT), USA
2013 Award of the program “Summer Visit to the United States for Young Researchers”, provided by the United States-Mexico Foundation for Science (FUMEC) and the Mexican Academy of Sciences to visit the group of Prof. Jonathan A. King at MIT, USA
2009 Selected by the Mexican Academy of Sciences to attend the 59th Meeting of Nobel Laureates and 19th Forum dedicated to Chemistry, Lindau, Germany
2007 For Women in Science L’Oreal-UNESCO-AMC Fellowship.
2017-2020 Member of the National System of Researchers (Mexico). Level II
2005-2016 Member of the National System of Researchers (Mexico). Level I

Other Experience and Professional Memberships

- Chair of V Latin American meeting in Biological Inorganic Chemistry (V LABIC), Querétaro, México, October 18-22, 2016.
- Co-organizer of the 1st, 2nd and 3rd USA-Mexico Workshops in Biological Chemistry: Protein Folding, Misfolding and Design; and the 2nd, 3rd and 4th National Meetings in Proteins (Congresos de la Rama de Físicoquímica, Estructura y Diseño de Proteínas de la Sociedad Mexicana de Bioquímica), Mexico (2009, 2011 and 2013)
- Reviewer of manuscripts for the following journals: J. Am. Chem. Soc., Inorg. Chem., Chem. Sci., Chem. Comm., RSC Advances, Metallomics, J. Biol. Inorg. Chem., J. Inorg. Biochem., Biophys. J., Chem. Soc. Rev., Coord. Chem. Rev.

- Reviewer of proposals: CONACyT (Mexican Council for Science and Technology), PROMEP-SEP, PAPIIT-UNAM, CONICET (National Council for Science and Technology in Argentina), Colciencias (Council for Science in Colombia), DFG (German Research Foundation)

Professional Memberships:

- Society for Biological Inorganic Chemistry (SBIC), 2011-present
- Nominations Committee of SBIC, 2012-2014
- American Chemical Society, 2007-present
- Sociedad Mexicana de Bioquímica (Mexican Society for Biochemistry), 2005-present

C. Selected Peer Reviewed Publications

- Sánchez-López, C.; Cortés-Mejía, R.; Miotto, M. C.; Binolfi, A.; Fernández, C.O.; M. del Campo, J.; Quintanar, L. "Copper coordination features of human islet amyloid polypeptide: The type 2 diabetes peptide" *Inorg. Chem.* **2016**, 55, 10727-10740.
- Rodríguez, E.; Arcos-López, T.; Trujano-Ortiz, L.; Fernández, C.O.; González, F.J.; Vela, A.; **Quintanar, L.** "Role of N-terminal methionine residues in the redox activity of copper bound to alpha-synuclein" *J. Biol. Inorg. Chem.* **2016**, 21, 691-702.
- Arcos-López, T.; Qayyum, M.; Rivillas-Acevedo, L.; Miotto, M.C.; Grande-Aztatzi, R.; Fernández, C.O.; Hedman, B.; Hodgson, K.O.; Vela, A.; Solomon, E.I.; **Quintanar, L.** "Spectroscopic and theoretical study of Cu(I) binding to His111 in the human prion protein fragment 106-115" *Inorg. Chem.* **2016**, 55, 2909-2922.
- **Quintanar, L.**; Dominguez-Calva, J.A.; Serebryany, E.; Rivillas-Acevedo, L.; Haase-Pettingell, C.; Amero, C.; King, J.A. "Copper and zinc ions specifically promote nonamyloid aggregation of the highly stable human γ -D crystallin" *ACS Chem. Biol.* **2016**, 11, 263-272.
- Rivillas-Acevedo, L.; Sánchez-López, C.; Amero, C.; **Quintanar, L.** "Structural Basis for the Inhibition of Truncated Islet Amyloid Polypeptide Aggregation by Cu(II): Insights into the Bioinorganic Chemistry of Type II Diabetes" *Inorg. Chem.* **2015**, 54, 3788-3796.
- Trujano-Ortiz, L. G.; González, F. J.; **Quintanar, L.** "Redox Cycling of Copper-Amyloid β 1-16 peptide complexes is highly dependent on the coordination mode" *Inorg. Chem.* **2015**, 54, 4-6.
- Márquez, M.; Blancas-Mejía, L. M.; Campos, A.; Rojas, L.; Castañeda-Hernández, G.; **Quintanar, L.** "A bifunctional non-natural tetrapeptide modulates amyloid-beta peptide aggregation in the presence of Cu(II)" *Metallomics.* **2014**, 6, 2189-2192.
- Miotto, M.C.; Rodríguez, E. E.; Valiente-Gabioud, A.A.; Torres-Monserrat, V.; Binolfi, A.; **Quintanar, L.**; Zweckstetter, M.; Griesinger, C.; Fernández, C. O. "Site-Specific Copper-Catalyzed Oxidation of Alpha-Synuclein: Tightening the Link between Metal Binding and Protein Oxidative Damage in Parkinson's Disease" *Inorg. Chem.* **2014**, 53, 4350-4358.
- **Quintanar, L.**; Rivillas-Acevedo, L.; Grande-Aztatzi, R.; Gómez-Castro, C. Z.; Arcos-López, T.; Vela, A. Copper Coordination to the Prion Protein: Insights from Theoretical Studies" *Coord. Chem. Rev.* **2013**, 257, 429-444.
- Quintanar, L.; Rivillas-Acevedo, L. "Studying Metal Ion – Protein Interactions: Electronic Absorption, Circular Dichroism and Electron Paramagnetic Resonance" In: "Protein Ligand Interactions", **2013**, Eds. M.A. Williams and T. Daviter. *Humana Press*.
- Binolfi, A.; **Quintanar, L.**; Bertoncini, C. W.; Griesinger, C.; Fernández, C. O. "Bioinorganic chemistry of copper coordination to alpha-synuclein: Relevance to Parkinson's disease" *Coord. Chem. Rev.* **2012**, 256, 2188-2201.
- **Quintanar, L.**; Montiel, T.; Márquez, M.; González, A.; Massieu, L. "Calpain activation is involved in acute manganese neurotoxicity in the rat striatum in vivo" *Exp. Neurol.* **2012**, 233, 182-192.
- Rivillas-Acevedo, L.; Grande-Aztatzi, R.; Lomelí I.; García, J. E.; Barrios, E.; Teloxa, S.; Vela, A.; **Quintanar, L.** "Spectroscopic and Electronic Structure Studies of Copper(II) Binding to His111 in the Human Prion Protein Fragment 106-115: Evaluating the Role of Protons and Methionine Residues" *Inorg. Chem.* **2011**, 50, 1956-1972.
- Binolfi, A.; Rodríguez, E. E.; Valensin, D.; D'Amelio, N.; Ippoliti, E.; Obal, G.; Duran, R.; Magistrato, A.; Pritsch, O.; Zweckstetter, M.; Valensin, G.; Carloni, P.; **Quintanar, L.**; Griesinger, C.; Fernández, C. O. "Bioinorganic Chemistry of Parkinson's disease: Structural Determinants for the Copper-mediated Amyloid formation of Alpha-Synuclein" *Inorg. Chem.* **2010**, 49, 10668-10679.
- Binolfi, A.; Lamberto, G.R.; Duran, R.; **Quintanar, L.**; Bertoncini, C.W.; Souza, J.M.; Cerveñansky, C.; Zweckstetter, M.; Griesinger, C.; Fernandez, C.O. "Site-Specific Interactions of Cu(II) with α and β -Synuclein: Bridging the Molecular Gap between Metal Binding and Aggregation" *J. Am. Chem. Soc.* **2008**, 130, 11801-11812.
- **Quintanar, L.** "Manganese neurotoxicity: a bioinorganic chemist's perspective." *Inorg. Chim. Acta.* **2008**, 361, 875-884.

- **Quintanar, L.**; Stoj, C.; Taylor, A. B.; Hart, P. J.; Kosman, D. J. and Solomon, E. I. "Shall We Dance? How a Multicopper Oxidase Chooses its Electron Transfer Partner." *Acc. Chem. Res.* **2007**, *40*, 445-452.

For updated information please visit: <http://scholar.google.com/citations?user=4am-dt0AAAAJ>

Thesis adviser (5 undergraduates, 4 masters and 4 PhD). Currently there are: 4 undergraduates, 3 PhD students and 1 postdoctoral researcher working under my supervision.

D. Research Support

Ongoing Research Support

CB-2013-221134 (CONACyT) Quintanar L (PI) 2015-2018
Investigación espectroscópica del efecto de cobre en la agregación de proteínas asociadas a enfermedades degenerativas: α -sinucleína, prion y γ -cristalina. Role: PI

MIT-CONACyT Quintanar L and King J (PIs) 2015-2017
Study of Copper and Zinc Binding to Gamma-Crystallins: Insights into the Bioinorganic Chemistry of Lens Cataracts Disease. Project in collaboration with Prof. Jonathan King (Massachusetts Institute of Technology, MIT). Role: PI

Completed Research Support

CB-2009-128411 (CONACyT) Rosales-Hoz M (PI) 2011-2016
Detección y/o Encapsulamiento de Agentes Químicos Contaminantes. Role: Collaborator

CONACyT-NSF Quintanar L and Solomon E (PIs) 2013-2015
X-ray Absorption Studies of Copper Binding to Alpha-Synuclein and the Prion Protein. Project in collaboration with Prof. Edward Solomon (Stanford University). Role: PI

MIT-ICyTDF Quintanar L and King J (PIs) 2012-2014
Spectroscopic Study of Copper Binding to Alpha-Crystallin and its Competitive Effect with Gamma-Crystallin. Project in collaboration with Prof. Jonathan King (Massachusetts Institute of Technology, MIT). Role: PI

CB-2009-128255 (CONACyT) Quintanar L (PI) 2011-2014
Investigación del mecanismo de formación de fibras amiloides de las proteínas prion, alfa-sinucleína y beta-amiloide: evaluación del efecto de la coordinación de Cu(II). Role: PI

PIFUTP08-161 (ICyTDF) Quintanar L (PI) 2009-2011
Diseño racional de fármacos para el tratamiento de la enfermedad de Alzheimer a partir de una investigación experimental y teórica de la proteína beta-amiloide. Role: PI

CB-2006-060366Q (CONACyT) Juaristi E (PI) 2007-2010
Síntesis, estudio estructural y evaluación de aminoácidos y péptidos no naturales: acercando a la química con la biología y la medicina. Role: Collaborator

CB-2005-J48781Q (CONACyT) Quintanar L (PI) 2007-2010
Investigación espectroscópica de la interacción de las proteínas prion y b-amiloide con Cu y Fe: coordinación del metal, plegamiento de la proteína y generación de especies reactivas de oxígeno.
Role: PI