

CONTACT INFORMATION

Name Irene Bolea, Ph.D
Address Institut de Neurociències (INc), Facultat de Medicina, M1/125. Universitat Autònoma de Barcelona. 08193 Bellaterra (Barcelona). Spain
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ACADEMIC DEGREES

- 2007-2011** **PhD - Neurosciences**
Departament de Bioquímica I Biologia Molecular. Institut de Neurociències. Universitat Autònoma de Barcelona, Spain.
Thesis Title: *Study of new propargylamine and donepezil-derived compounds as multitarget agents for the treatment of Alzheimer's disease*
- 2005-2007** **MSc - Neurosciences**
Departament de Bioquímica I Biologia Molecular. Institut de Neurociències. Universitat Autònoma de Barcelona, Spain.
- 2000-2005** **BSc - Biochemistry**
Facultat de Ciències. Universitat Autònoma de Barcelona, Spain.

POSITIONS HELD

- 2015-present** **Postdoctoral fellow**
Institut de Neurociències. Universitat Autònoma de Barcelona, Spain.
Supervisor: Dr. Albert Quintana
- 2014-2015** **Senior fellow**
Center for Developmental Therapeutics and Center for Integrative Brain Research. Seattle Children's Research Institute. University of Washington. Seattle (WA)
Supervisor: Dr. Albert Quintana
- 2013-2014** **Postdoctoral fellow**
Brain and Mind Research Institute. Weill Cornell Medical College, New York (NY)
Supervisor: Dr. Jordi Magrané
- 2005-2011** **Graduate Student**
Departament de Bioquímica I Biologia Molecular. Institut de Neurociències. Universitat Autònoma de Barcelona, Spain.
Supervisor: Dr. Mercedes Unzeta

RESEARCH EXPERIENCE

- 2015-present** **Postdoctoral fellow**
Institut de Neurociències. Universitat Autònoma de Barcelona, Spain.
Project: *Study of mitochondrial dynamics and function in neurons susceptible to mitochondrial disease*
Supervisor: Dr. Albert Quintana

- 2014-2015 Senior Fellow**
Center for Developmental Therapeutics and Center for Integrative Brain Research. Seattle Children's Research Institute. University of Washington. Seattle (WA)
Project: *Study of mitochondrial dynamics and function in neurons susceptible to mitochondrial disease*
Supervisor: Dr. Albert Quintana
- 2013-2014 Postdoctoral fellow**
Brain and Mind Research Institute. Weill Cornell Medical College, New York (NY)
Project: *Analysis of mitochondrial dynamics in cultured neurons and in in vivo mouse models of Friedreich's ataxia.*
Supervisor: Dr. Jordi Magrané
- 2007-2011 Graduate student**
Departament de Bioquímica I Biologia Molecular. Institut de Neurociències Universitat Autònoma de Barcelona, Spain.
Project: *Characterisation and biological evaluation of new multitarget molecules to be used in the treatment of Alzheimer's disease*
Supervisor: Dr. Mercedes Unzeta
- 2005-2007 Visiting research student**
Department of Preclinical and Clinical Pharmacology. Università degli Studi di Firenze, Italy.
Project: *Study of the neuroprotective effects of a Monoamine Oxidase inhibitor against excitotoxicity in vivo.*
Supervisor: Dr. Laura Della Corte

FELLOWSHIPS

- 2010 Short term Scientific Mission (STSM) Fellowship**
COST (European Cooperation in Science and Technology) Program. European Union
Host Institution: Università degli Studi di Firenze, Italy.
- 2007 Short term Scientific Mission (STSM) Fellowship**
COST (European Cooperation in Science and Technology) Program. European Union
Host Institution: Università degli Studi di Firenze, Italy.
- 2006 Short term Scientific Mission (STSM) Fellowship**
COST (European Cooperation in Science and Technology) Program. European Union
Host Institution: Università degli Studi di Firenze, Italy.
- 2005 Undergraduate European Exchange Fellowship**
Erasmus program. Universitat Autònoma de Barcelona
Host Institution: Università degli Studi di Firenze, Italy.

RESEARCH SUPPORT

- 2015-** Project: *Neuromito: Elucidating neuronal susceptibility to mitochondrial disease.*
ERC-2014-StG-638106
Funding Agency: European Research Council Starting Grant
PI: Albert Quintana
- 2014-2015** Project: *Molecular determinants of neuronal death in mitochondrial disease*
Funding Agency: Seattle Children's Research Institute
PI: Albert Quintana

- 2013-2014** Project: *Analysis of mitochondrial dynamics in cultured neurons and in in vivo mouse models of Friedreich's ataxia.*
Funding Agency: Friedreich's Ataxia Research Alliance (FARA)
PI: Jordi Magrane. Weill Cornell Medical College
- 2009-2012** Project: *Design, synthesis and pharmacological evaluation of new neuroprotective propargylamines for the treatment of Alzheimer's disease*
Funding Agency: Spanish Ministry of Education and Science.
PI: Mercedes Uzeta. Universitat Autònoma de Barcelona.
Reference: SAF 2009-07279
- 2006-2010** Project: *Methodologies for the design, evaluation and validation of functional foods in the prevention of cardiovascular diseases and Alzheimer's disease.*
Funding Agency: Spanish Ministry of Industry, Tourism and Trade. Program CENIT-INGENIO 2010
PI: Bartolome Ramirez and Mercedes Unzeta. La Morella NUTS and Universitat Autònoma de Barcelona
Reference: MET-DEV-FUN 2006
- 2006-2009** Project: *Pharmacological evaluation of novel molecules for the treatment of Alzheimer's disease*
Funding Agency: Spanish Ministry of Education and Science
PI: Mercedes Unzeta. Universitat Autònoma de Barcelona.
Reference: SAF 2006-08764-C02-02
- 2005-2010** Project: *Molecular targeting and drug design in neurological and bacterial diseases*
Funding Agency: European Cooperation in Science and Technology (COST)
PI: Mercedes Unzeta. Universitat Autònoma de Barcelona.
Reference: D34/0003/05

PUBLICATIONS

A) Manuscripts

- 2015** Fernández-Fernández L, Esteban G, Giralt M, Valente T, **Bolea I**, Solé M, Sun P, Benítez S, Morelló JR, Reguant J, Ramírez B, Hidalgo J, Unzeta M. *Catecholaminergic and cholinergic systems of mouse brain are modulated by LMN diet, rich in theobromine, polyphenols and polyunsaturated fatty acids. Food Funct* 6:1251-1260.
- 2014** **Bolea I**, Colivicchi MA, Ballini C, Marco-Contelles J, Tipton KF, Unzeta M and Della Corte L. *Neuroprotective effects of the MAO-B inhibitor, PF9601N, in an in vivo model of excitotoxicity. CNS Neurosci Ther* 20:641-50.
- Bautista-Aguilera OM, Esteban G, **Bolea I**, Nikolic K, Agbaba D, Moraleda I, Iriepa I, Samadi A, Soriano E, Unzeta M, Marco-Contelles J. *Design, synthesis, pharmacological evaluation, QSAR analysis, molecular modeling and ADMET of novel donepezil-indolyl hybrids as multipotent cholinesterase/monoamine oxidase inhibitors for the potential treatment of Alzheimer's disease. Eur J Med Chem* 75:82-95
- 2013** **Bolea I**, Gella A, Monjas L, Pérez C, Rodríguez-Franco MA, Marco-Contelles J, Samadi A and Unzeta M. *Multipotent, permeable drug ASS234 inhibits A β aggregation, possesses antioxidant properties and protects from A β -induced apoptosis in vitro. Current Alzheimer Res* 10:797-808.

Gella A, Solé M, **Bolea I**, Ventriglia M, Siotto M, Durany N, Squitti R, Unzeta M. A comparison between radiometric and fluorimetric methods for measuring SSAO activity. *J Neural Transm* 120:1015-1018

Esteban G, **Bolea I**, Sun P, Solé M, Samadi A, Marco-Contelles J, Unzeta M. A therapeutic approach to cerebrovascular diseases based on indole substituted hydrazides and hydrazines able to interact with human vascular adhesion protein-1, monoamine oxidases (A and B), AChE and BuChE. *J Neural Transm* 120: 911-918

Bolea I, Gella A, Unzeta M. Propargylamine-derived multitarget-directed ligands: fighting Alzheimer's disease with monoamine oxidase inhibitors. *J Neural Transm* 120: 893-902

2012 Samadi A, De los Ríos C, **Bolea I**, Chioua M, Iriepa I, Moraleda I, Bartolini M, Andrisano V, Gálvez E, Valderas C, Unzeta M and Marco-Contelles J. Multipotent MAO and Cholinesterase Inhibitors for the Treatment of Alzheimer's Disease: Synthesis, Pharmacological Analysis and Molecular Modeling of Heterocyclic Substituted Alkyl and Cycloalkyl Propargyl Amine. *Eur J Med Chem* 52:251-262.

Fernández-Fernández L, Comes G, **Bolea I**, Valente T, Ruiz J, Murtra P, Ramírez B, Anglés N, Reguant J, Morelló JR, Boada M, Hidalgo J, Escorihuela RM and Unzeta M. LMN diet, rich in polyphenols and polyunsaturated fatty acids, improves mouse cognitive decline associated with aging and Alzheimer's disease. *Behav Brain Res* 228(2):261-271.

2011 **Bolea I**, Juárez-Jiménez J, de los Ríos C, Chioua M, Pouplana R, Luque FJ, Unzeta M, Marco-Contelles J and Samadi A. Synthesis, Biological Evaluation and Molecular Modelling of Donepezil and N-[(5-(Benzyloxy)-1-methyl-1H-indol-2-yl)methyl]-N-methylprop-2-yn-1-amine Hybrids, as New Multipotent ChE/MAO Inhibitors for the Treatment of Alzheimer's Disease. *J Med Chem* 54(24):8251-8270.

Samadi A, Chioua M, **Bolea I**, de los Ríos C, Iriepa I, Moraleda I, Bastida A, Esteban E, Unzeta M, Gálvez E and Marco-Contelles J. Synthesis, biological assessment and molecular modeling of new multipotent MAO and cholinesterase inhibitors as potential drugs for the treatment of Alzheimer's disease. *Eur J Med Chem* 46(9):4665-4668

2009 Valente T, Hidalgo J, **Bolea I**, Ramirez B, Anglés N, Reguant J, Morelló JR, Gutiérrez C, Boada M and Unzeta M. A diet enriched in polyphenols and polyunsaturated fatty acids, LMN diet, induces neurogenesis in the subventricular zone and hippocampus of adult mouse brain. *J Alzheimer's Dis* 18(4):849-865.

2006 Hernández-Guillamón M, **Bolea I***, Solé M, Boada M and Unzeta M. Sodium bicarbonate enhances membrane-bound and soluble semicarbazide-sensitive amine oxidase activity in vitro. *J Biochem* 142(5):571-576. *co-first author

B) Book Chapters

2014 Laura Fernandez-Fernandez, Montse Solé, **Irene Bolea**, Tony Valente, Jose C.E. Serrano, Mariona Jove, Bartolome Ramirez, Neus angles, Jordi Reguant, Jose Ramon Morello, Reinald Pamplona, Manuel Portero-Otin, Mercedes Unzeta. The antioxidant effect of LMN diet, rich in polyphenols and polyunsaturated fatty acids, in Alzheimer's disease. In Colin R. Martin and Victor R. Preedy, editors: Diet and Nutrition in Dementia and Cognitive Decline, Academic Press, 2014, pp.847-857

Irene Bolea, Wenbiao Gan, Giovanni Manfredi, Jordi Magrané. *Imaging of Mitochondrial Dynamics in Motor and Sensory Axons of Living Mice*. In Anne N. Murphy, David C. Chan, editors: *Mitochondrial Function*, Vol 547, MIE, UK: Academic Press, 2014, pp. 97-110

- 2011** Alejandro Gella & **Irene Bolea**. *Oxidative Stress in Alzheimer's disease: Pathogenesis, Biomarkers & Therapy*. Alzheimer's disease Pathogenesis-Core Concepts, Shifting Paradigms and Therapeutic Targets, Suzanne De La Monte (Ed.), ISBN: 978-953-307-690-4, InTech

CONFERENCES AND MEETINGS

- 2015** **Bolea I**, Gella A, Hui J, Sanz E, Quintana A.
Leigh syndrome-like phenotype in a mouse lacking Ndufs4 in glutamatergic neurons. EMBO workshop. Mitochondrial DNA and neurodegeneration. Sitges, Spain.
Poster Presentation
- 2012** **Bolea I**, Gella A, Samadi A, Marco JL and Unzeta M.
The new multi-target directed ligand ASS234 reduces A β fibrillogenesis and protects neuroblastoma cells from A β -induced toxicity.
8th FENS Forum for Neurosciences. Barcelona, Spain.
Poster Presentation
- 2011** **Bolea I**, Gella A, Samadi A, Marco-Contelles J and Unzeta M.
ASS234, a new promising multitarget-directed ligand for the treatment of Alzheimer's disease. Global Alzheimer's Research Summit. Madrid, Spain.
Poster Presentation
- Bolea I**, Gella A, Samadi A, Marco-Contelles J and Unzeta M.
New multipotent inhibitors of MAO and ChEs as promising molecules for the treatment of Alzheimer's disease.
The 10th International Conference on Alzheimer's & Parkinson's diseases (AD/PD).
Barcelona, Spain
Poster Presentation
- 2009** **Bolea I**, Valente T, Hidalgo J, Comes G, Ramírez B, Anglès MN, Morelló JM, Reguant J, Boada M and Unzeta M.
Modulation of catecholaminergic and cholinergic neurons in mice fed with LMN diet, rich in polyphenols and polyunsaturated fatty acids.
International Conference on Alzheimer's Disease (ICAD). Vienna, Austria.
Poster Presentation
- 2008** **Bolea I**, Ballini C, Colivicchi MA, Fattori M, Marco JL, Unzeta M and Della Corte L.
The Protective Properties of the Acetylenic Tryptamine Derivative, PF9601N, Against Excitotoxic Damage.
13th Amine Oxidase and Related Diseases Workshop. Beijing, China.
Poster Presentation
- Bolea I**, Ballini C, Colivicchi MA, Fattori M, Marco JL, Unzeta M and Della Corte L.
Neuroprotective properties of PF9601N, an acetylenic tryptamine derivative, against the excitotoxic damage induced by kainate: an in vivo microdialysis study.
International Symposium on Novel Advances in Parkinson's disease. Salamanca, Spain
Poster Presentation

- 2006** **Bolea I**, Hernández M, Solé M and Unzeta M
Sodium Bicarbonate Enhances Membrane-Bound and Soluble Human SSAO Activity In Vitro.
12th Amine Oxidase and Trace Amines Workshop. Rotterdam, The Netherlands
Poster Presentation

AWARDS AND MERITS

- 2015** International Grant Award. Meeting Attendance
EMBO workshop. Mitochondrial DNA and neurodegeneration. Sitges, Spain.
- 2009** International Grant Award. Meeting Attendance
International conference on Alzheimer's disease (ICAD), Vienna, Austria

TEACHING EXPERIENCE

- 2007-2010** Clinical Biochemistry. Practical classes
Department of Biochemistry and Molecular Biology.
Universitat Autònoma de Barcelona, Spain.
4th year Bsc in Biology
100 h
- 2007-2008** Clinical Biochemistry and Molecular Biology. Practical classes
Department of Biochemistry and Molecular Biology.
Universitat Autònoma de Barcelona, Spain.
4th year Bsc in Biochemistry
10 h
- 2006-2007** Biochemistry of the Nervous System. Practical classes
Department of Biochemistry and Molecular Biology.
Universitat Autònoma de Barcelona, Spain.
3rd year Bsc in Biochemistry
15 h

PATENTS

Abdelouahid Samadi, José Luis Marco Contelles, **Irene Bolea**, Mercedes Unzeta, Francisco Javier Luque. *New propargylamine derivatives with neuroprotective capacity for the treatment of Parkinson's and Alzheimer's diseases.* International publication number: WO2011113988. US publication number: US2013012522. Spanish publication number: ES2365316. Filed March 2011