

BIOGRAPHICAL SKETCH

Provide the following information for all key personnel.
Follow the sample format for each person found in **Biosketch Sample**. **DO NOT EXCEED FOUR PAGES.**

NAME Isidro Ferrer	POSITION TITLE Professor and Chair of Pathology at the Department of Pathology and Experimental Therapeutics, University of Barcelona, Spain		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Barcelona	Medicine, MD	1976	Pathology
University of Barcelona	PhD	1978	Pathology
Hospital Principes España, Ministerio Educación y Ciencia	Specialist in Pathology	1978	Pathology

A. Positions and Honors.

Born in Barcelona, 1951; Doctor in Medicine, University of Barcelona, 1978; Specialist in Pathology, Ministry of Health, 1978; Head of the Unit of Neuropathology, Hospital Príncipes de España, 1980; consultant neuropathologist Hospital Sant Joan de Deu, Barcelona 1978-1990; Consultant neuropathologist Hospital Santa Creu i Sant Pau, Barcelona, 1978-1990; student professor 1982-1986; Associate Professor of Pathology, University of Barcelona, 1986-1990; Director Institute of Neuropathology, Bellvitge University Hospital, 1990-2016; Founder and director of the Institute of Neuropathology Brain Bank, and consultant neuropathologist at the University of Barcelona Brain Bank 1990-2006; Professor of Pathology, University of Barcelona 1990-1996; Full Professor and Chair of Pathology 1996-present; Coordinator of the Spanish Network "Centro de Investigación de Enfermedades Neurológicas (CIEN)", Ministry of Health, Instituto Carlos III 2000-2004; Vice-Chancellor of Scientific Policy of the University of Barcelona; Investigator and PI Neuropathology group at CIBERNED (Biomedical network research center of neurodegenerative diseases), National Institute of Health Carlos III, Ministry of Economy, Industry and Competitiveness, 2006-present.

Narcis Monturiol Prize for Research of the Catalonia Government; August Jakob medaille of the German Society of Anatomy and Neuropathology

Biography: Lancet neurology, I Ferrer: a revolutionary neuropathologist, 2013; Journal of Alzheimer's Disease: Sisyphus in Neverland, 2017.

Main topics of interest: Molecular neuropathology of human neurodegenerative diseases, including Alzheimer's disease, tauopathies, alpha-synucleinopathies, amyotrophic lateral sclerosis and prion diseases; samples obtained from the Institute of Neuropathology and University of Barcelona Brain Banks. Former member of the European Excellence Networks: European Brain Bank Network (BrainNet), NeuroPrion; and European projects: INDABIP and DEVELAGE.

Other merits: supervisor of 36 Doctoral Theses

Member of the advisory board of the journals: Brain Pathology, Frontiers in Aging Neuroscience, Journal of Alzheimer's Disease, American Journal Neurodegenerative Diseases, International Journal of Neuropathology, Folia Neuropathologica, Journal Epigenetics; and Associate Editor of the Journal of Neuropathology and Experimental Neurology

B. Selected peer-reviewed publications (in chronological order).

Total number of publications 758; H index 2017: 73

Selected publications in the last four years:

Ferrer I, López-González I, Carmona M, Arregui L, Dalfo E, Torrejón-Escribano B, Diehl R, Kovacs GG. Glial and neuronal tau pathology in tauopathies: characterization of disease-specific phenotypes and tau pathology progression. J Neuropathol Exp Neurol 73: 81-97 (2014)

Llorens F, Ferrer I, Del Río JA. Gene expression resulting from PrP(C) ablation and PrP (C) overexpression in murine and cellular models. Mol Neurobiol 49: 413-23 (2014)

Hoegg-Beiler MB, Sirisi S, Orozco IJ, Ferrer I, Hohensee S, Auberson M, Gödde K, Vilches C, de Heredia ML, Nunes V, Estévez R, Jentsch TJ. Disrupting MLC1 and GlialCAM and CIC-2 interactions in leukodystrophy entails glial chloride channel dysfunction. *Nature Commun* 5: 3475 (2014)

Fabelo N, Martín V, Marín R, Moreno D, Ferrer I, Díaz M. Altered lipid composition in cortical lipid rafts occurs at early stages of sporadic Alzheimer's disease and facilitates APP/BACE1. *Neurobiol Aging* 35: 1801-1812 (2014)

Jové M, Portero-Otín M, Naudí A, Ferrer I, Pamplona R. Metabolomics of human brain aging and age-related neurodegenerative diseases. *J Neuropathol Exp Neurol* 73: 640-657 (2014)

Llorens F, López-González I, Thüne K, Carmona M, Zafar S, Andreoletti O, Zerr I, Ferrer I. Subtype and regional-specific neuroinflammation in sporadic Creutzfeldt-Jakob disease. *Front Aging Neurosci* 6: a198 (2014)

Fernández-Nogales M, Cabrera JR, Santos-Galindo M, Hoozemans JJ, Ferrer I, Rozemuller AJ, Hernández F, Avila J, Lucas JJ. Huntington's disease is a four-repeat tauopathy with tau nuclear rods. *Nat Med* 20: 881-885 (2014)

García-Esparcia P, Llorens F, Carmona M, Ferrer I. Complex deregulation of cytokines and mediators of the immune response in Parkinson's disease brain is region dependent. *Brain Pathol* 24: 584-598 (2014)

Ansoleaga B, Jové M, Schlüter A, García-Esparcia P, Moreno J, Pujol A, Pamplona R, Portero-Otín M, Ferrer I. Deregulation of purine metabolism in Alzheimer's disease. *Neurobiol Aging* 36: 68-80 (2015)

Díaz M, Fabelo N, Martín V, Ferrer I, Gómez T, Marín R. Biophysical alterations in lipid rafts from human cerebral cortex associate with increased BACE1/APP interaction in early stages of Alzheimer's disease. *J Alzheimer's Disease* 43: 1185-1198 (2015)

López-González I, Schlüter A, Aso E, García-Esparcia P, Ansoleaga B, Llorens F, Carmona M, Moreno J, Fuso A, Portero-Otín M, Pamplona R, Pujol A, Ferrer I. Neuroinflammatory Signals in Alzheimer Disease and APP/PS1 Transgenic Mice: Correlations With Plaques, Tangles, and Oligomeric Species. *J Neuropathol Exp Neuro* 74: 319-344 (2015)

Ferrer I, Legati A, García-Monco JC, Gómez-Beldarrain M, Carmona M, Blanco R, Seeley WW, Coppola G. Familial behavioral variant frontotemporal dementia associated with astrocyte-predominant tauopathy. *J Neuropathol Exp Neurol* 74: 370-379 (2015)

Llorens F, Zafar S, Ansoleaga B, Shafiq M, Blanco R, Carmona M, Grau-Rivera O, Nos C, Gelpi E, del Río JA, Zerr I, Ferrer I. Subtype and regional regulation of prion biomarkers in sporadic Creutzfeldt-Jakob disease. *Neuropathol Appl Neurobiol* 41: 631-645 (2015)

López-González I, Aso E, Carmona M, Armand-Ugon M, Blanco R, Naudí A, Cabré R, Portero-Otín M, Pamplona R, Ferrer I. Neuroinflammatory Gene Regulation, Mitochondrial Function, Oxidative Stress, and Brain Lipid Modifications With Disease Progression in Tau P301S Transgenic Mice as a Model of Frontotemporal Lobar Degeneration-Tau. *J Neuropathol Exp Neurol* 74: 975-99 (2015)

García-Esparcia P, Hernández-Ortega K, Ansoleaga B, Carmona M, Ferrer I. Purine metabolism gene deregulation in Parkinson's disease. *Neuropathol Appl Neurobiol* 41: 926-40 (2015)

García-Esparcia P, Hernández-Ortega K, Koneti A, Gil L, Delgado-Morales R, Castaño E, Carmona M, Ferrer I. Altered machinery of protein synthesis is region- and stage-dependent and is associated with α -synuclein oligomers in Parkinson's disease. *Acta Neuropathol Comm* 3: 76 (2015)

Vergara C, Ordóñez-Gutiérrez L, Wandosell F, Ferrer I, del Río JA, Gavín R. Role of PrP(C) Expression in Tau Protein Levels and Phosphorylation in Alzheimer's Disease Evolution. *Mol Neurobiol* 51: 1206-1220 (2015)

Kalaria, Ferrer I, Lowe S. Chapter 2: Vascular disease, hypoxia and related conditions. In *Greenfield's Neuropathology* 9th Edition. Love S, Budka H, Ironside JW, Perry A (eds). CRC Press, Boca Raton, Florida, 2015 pp: 59-209

Blanch M, Mosquera JL, Ansoleaga B, Ferrer I, Barrachina M. Altered Mitochondrial DNA Methylation Pattern

in Alzheimer Disease-Related Pathology and in Parkinson Disease. *Am J Pathol* 186: 385-397 (2016)

Kovacs GG, Ferrer I, Grinberg LT, et al. Aging-related tau astroglipathy (ARTAG): harmonized evaluation strategy. *Acta Neuropathol* 131: 87-102 (2016)

López-González I, Pérez-Mediavilla A, Zamarbide M, Carmona M, Torrejón Escribano B, Glatzel M, Galliciotti G, Ferrer I. Limited unfolded protein response and inflammation in neuroserpinopathy. *J Neuropathol Exp Neurol* 75: 121-131 (2016)

Llorens F, Schmitz M, Ferrer I, Zerr I. CSF biomarkers in neurodegenerative and vascular dementias. *Prog Neurobiol* 138-140: 36-53 (2016)

Aso E, Ferrer I. CB2 Cannabinoid Receptor As Potential Target against Alzheimer's Disease. *Front Neurosci* 31:10: 243 (2016)

Domínguez M, de Oliveira E, Odena MA, Portero M, Pamplona R, Ferrer I. Redox proteomic profiling of neuroketal-adducted proteins in human brain: Regional vulnerability at middle age increases in the elderly. *Free Radic Biol Med* 95: 1-15 (2016)

Ferrer I, Garcia-Esparcia P, Carmona M, Carro E, Aronica E, Kovacs GG, Grison A, Gustincich S. Olfactory receptors in non-chemosensory organs: the nervous system in health and disease. *Front Aging Neurosci* 8: 163 (2016)

Ansoleaga B, Garcia-Esparcia P, Llorens F, Hernández-Ortega K, Carmona Tech M, Antonio Del Rio J, Zerr I, Ferrer I. Altered mitochondria, protein synthesis machinery, and purine metabolism are molecular contributors to the pathogenesis of Creutzfeldt-Jakob disease. *J Neuropathol Exp Neurol* 75: 755-769 (2016)

Cabre R, Jove M, Naudi A, Ayala V, Piñol-Ripoll G, Gil-Villar MP, Dominguez-Gonzalez M, Obis E, Berdun R, Mota-Martirell N, Portero-Otin M, Ferrer I, Pamplona R
Specific metabolomics adaptations define a differential regional vulnerability in the adult human cerebral cortex. *Front Mol Neurosci* 9, 138 (2016)

Llorens F, Thüne K, Schmitz M, Ansoleaga B, Frau-Méndez MA, Cramm M, Tahir W, Gotzmann N, Berjaoui S, Carmona M, Silva CJ, Fernandez-Vega I, Zarranz JJ, Zerr I, Ferrer I. Identification of new molecular alterations in Fatal Familial Insomnia. *Hum Mol Genet* 25: 2417-2436 (2016)

Hernández-Ortega K, Garcia-Esparcia P, Gil L, Lucas JJ, Ferrer I. Altered machinery of protein synthesis in Alzheimer's: from the nucleolus to the ribosome. *Brain Pathol* 26: 593-605 (2016)

Cabré R, Naudí A, Dominguez-Gonzalez M, Ayala V, Jové M, Mota-Martorell N, Piñol-Ripoll G, Gil-Villar MP, Rué M, Portero-Otín M, Ferrer I, Pamplona R. Sixty years old is the breakpoint of human frontal cortex aging. *Free Radic Biol Med* 103:14-22 (2016)

Frau-Méndez MA, Fernández-Vega I, Ansoleaga B, Blanco R, Carmona M, Antonio Del Rio J, Zerr I, Llorens F, Zarranz JJ, Ferrer I. Fatal familial insomnia: Mitochondrial and protein synthesis machinery decline in the mediodorsal thalamus. *Brain Pathol* 27: 95-106 (2017)

Garcia-Esparcia P, López-González I, Grau-Rivera O, García-Garrido MF, Konetti A, Llorens F, Zafar S, Carmona M, del Rio JA, Zerr I, Ferrer I. Dementia with Lewy bodies: molecular pathology in the frontal cortex in typical and rapidly progressive forms. *Front Neurol* 8: 89 (2017)

Naudí A, Cabré R, Dominguez-Gonzalez M, Ayala V, Jové M, Mota-Martorell N, Piñol-Ripoll G, Gil-Villar MP, Rué M, Portero-Otín M, Ferrer I, Pamplona R. Region-specific vulnerability to lipid peroxidation and evidence of neuronal mechanisms for polyunsaturated fatty acid biosynthesis in the healthy adult human central nervous system. *Biochim Biophys Acta* 1862: 485-495 (2017)

Andrés-Benito P, Moreno J, Aso E, Povedano M, Ferrer I. Amyotrophic lateral sclerosis, gene deregulation in the anterior horn of the spinal cord and frontal cortex area 8: implications in frontotemporal lobar degeneration. *Aging* 9: 823-851 (2017)

Garcia-Esparcia P, Sideris-Lampretsas G, Hernandez-Ortega K, Grau-Rivera O, Sklaviadis T, Gelpi E, Ferrer I. Altered

mechanisms of protein synthesis in frontal cortex in Alzheimer disease and a mouse model. *Am J Neurodegener Dis* 6: 15-25 (2017)

Ferrer I. Diversity of astroglial responses across human neurodegenerative disorders and brain aging. *Brain Pathol* 2017; 27: 645-674.

Andrés-Benito P, Fernández-Dueñas V, Carmona M, Escobar LA, Torrejón-Escribano B, Aso E, Ciruela F, Ferrer I. Locus coeruleus at asymptomatic early and middle Braak stages of neurofibrillary tangle pathology. *Neuropathol Appl Neurobiol* 2017; 43: 373-392.

Urrea L, Ferrer I, Gavín R, Del Río JA. The cellular prion protein (PrP_c) as neuronal receptor for α -synuclein. *Prion* 2017; 11: 226-233.

López-González I, Viana R, Sanz P, Ferrer I. Inflammation in Lafora disease: evolution with disease progression in laforin and malin knock-out mouse models. *Mol Neurobiol* 54: 3119-3130 (2017)

Ferrer I, Vidal N. Neuropathology of cerebrovascular diseases. *Handb Clin Neurol* 145: 79-114 (2017)

Llorens F, Thüne K, Tahir W, Kanata E, Diaz-Lucena D, Xanthopoulos K, Kovatsi E, Pleschka C, Garcia-Esparcia P, Schmitz M, Ozbay D, Correia S, Correia Á, Milosevic I, Andréoletti O, Fernández-Borges N, Vorberg IM, Glatzel M, Sklaviadis T, Torres JM, Krasemann S, Sánchez-Valle R, Ferrer I, Zerr I. YKL-40 in the brain and cerebrospinal fluid of neurodegenerative dementias. *Mol Neurodegener* 12: 83 (2017)

Pose-Utrilla J, García-Guerra L, Del Puerto A, Martín A, Jurado-Arjona J, De León-Reyes NS, Gamir-Morralla A, Serrano ÁS, García-Gallo M, Kremer L, Fielitz J, Ireson C, Pérez-Álvarez MJ, Ferrer I, Hernández F, Ávila J, Lasa M, Campanero MR, Iglesias T. Excitotoxic inactivation of constitutive oxidative stress detoxification pathway in neurons can be rescued by PKD1. *Nat Commun* 8: 2275 (2017)

Rodríguez-Rodríguez P, Sandebring-Matton A, Merino-Serrais P, Parrado-Fernandez C, Rabano A, Winblad B, Ávila J, Ferrer I, Cedazo-Minguez A. Tau hyperphosphorylation induces oligomeric insulin accumulation and insulin resistance in neurons. *Brain* 140: 3269-3285 (2017)

C. Research Support.

Interactomes and markers to discriminate regional neuronal vulnerability in aging and neurodegenerative diseases in elderly. Spanish Institute of Health Carlos III, FIS PI/14-757; PI: Isidro Ferrer; Duration: 2015-2017

Epigenetic and environmental factors bracing cognitive impairment and melancholic depression in elderly and neurodegeneration. Spanish Institute of Health Carlos III, FIS PIE/14-0034; PI: Isidro Ferrer; Duration: 2015-2017

Epigenetic mechanisms involved in the etiology and progression of rapid neurodegenerative dementias. Intraciber: CIBERNED; Co-Inv: Isidro Ferrer; Duration: 2015-2016

The part of the cloud challenge on neuroinflammation. Sativex. Alzheimer's Association; PI: Isidro Ferrer; Duration: 2017-2018

ARTAG. Spanish Institute of Health Carlos III, FIS PI/14-757; PI: Isidro Ferrer; Duration: 2017-2020

The ALS Ciberned Challenge: Accelerating New Drug Discovery. Intraciber: CIBERNED; Co-Inv: Isidro Ferrer; Duration: 2017-2018

EFA148/16/REDPRION. Interreg Poctefa. European Union EFA: 148/16.; Co-Inv: I Ferrer; Duration: 2017-2019