

Parkinson Disease and Movement Disorders

Group leader

Kulisevsky Bojarski, Jaime (FGS)

Researchers

Aracil Bolaños, Ignacio (FGS)

Campolongo Perillo, Antonia (FGS)

García Sánchez, Carmen (FGS)

Gironell Carrero, Alexandre (FGS)

Horta Barba, Andrea (IR)

Martínez Horta, Saül Indra (FGS)

Olmedo Saura, Gonzalo (IR)

Pagonabarraga Mora, Javier (FGS)

Pascual Sedano, Berta M (FGS)

Pérez Pérez, Jesús (FGS)

Ruiz Barrio, Iñigo (IR)

Sampedro Santaló, Frederic (FGS)

Vázquez Oliver, Anna (CIBER)

Research technicians

Alonso del Olmo, Gloria (IR)

Berzosa González, Irene (IR)

Bojtos, Lidia (IR)

Bonavita, Sofía (IR)

Burgos Renedo, María (IR)

Fernández Vizuete, Cristina (IR)

Franch Martí, Carla (IR)

Pérez Carasol, Laura (IR)

Pla Sánchez, Mónica (IR)

Pons Pons, Gràcia (IR)

Puig Davi, Arnau (IR)

Rivas Asensio, Elisa María (IR)

Rodríguez Salgueiro, Sílvia (IR)

Rodríguez-Antigüedad Muñoz, Jon (IR)

Rubio Romera, Margarita (IR)

Salvat Rovira, Nil (IR)

Socarrás Arredondo, María Andrea (IR)

Soler Almendros, Judit (IR)



DESCRIPTION

Led by Jaime Kulisevsky MD, PhD, and based at the Movement Disorders Unit of Sant Pau Hospital and the Biomedical Research Institute, the group focuses on Parkinson's disease, Huntington's disease, atypical parkinsonisms, tremor, and other movement disorders. Priority lines include the study of neuronal mechanisms underlying cognitive impairment and neuropsychiatric symptoms, the development of specific diagnostic tools, and the analysis of pharmacological responses using neuroimaging, neuropsychology, clinical assessment, brain stimulation, genetics, and fluid biomarkers, among others.

MAIN LINES OF RESEARCH

- Research on cognitive impairment, behavioural dysfunctions, and other motor and non-motor symptoms in Parkinson's disease, using neurophysiological and neuroimaging techniques to identify biomarkers and to develop disease-specific tools for cognitive and functional assessment. (Kulisevsky Bojarski, Jaime; Pagonabarraga Mora, Javier; Pascual Sedano, Berta M).
- Investigation of clinical progression, cognitive phenotypes, and biomarkers in Huntington's disease, both in premanifest and manifest stages, through international cohort studies, multimodal neuroimaging, and the analysis of large-scale databases. (Martínez Horta, Saul Indra; Pérez Pérez, Jesús).

- Development of specific cognitive assessment tools for progressive supranuclear palsy and study of the neural correlates of clinical progression, cognitive decline, and behavioural alterations. (Pagonabarraga Mora, Javier).
- Clinical, neurophysiological, and neuroimaging characterisation of essential tremor, aimed at improving diagnostic accuracy and understanding disease mechanisms. (Gironell Carrero, Alexandre).
- Subthalamic DBS study in PD: Functional reorganisation of brain networks and repercussions on postsurgical complications.
- Monitoring the mobility using a sensor in fluctuating PD for therapeutic purposes. Multicenter Clinical Trial (INV-PROC-A118).
- 2. Huntington's Disease (HD).
 - Coordination of the "Cognitive Phenotype Working Group" (European Huntington's Disease Network).
 - Spanish Coordination of Enroll-HD: A Prospective Registry Study in a Global Huntington's Disease Cohort (PI in Spain: J. Kulisevsky)
 - Validation of cognitive (HD-CRS) and functionality (HD-CFRS) scales.
 - Development and validation of new tools for cognitive and functional assessment of cognitive impairment in HD.

SCIENTIFIC CHALLENGES

- 1. Parkinson's Disease (PD)

General

COPPADIS: Cohort of Patients with Parkinson's Disease in Spain (national collaborative study).

 - Intensification for Specialist Physicians of the "Strategic Research and Innovation Plan" (PERIS) Expedient Number: SLT008 / 18.

Cognition

DuoCog: randomised, double blind and crossed study (immediate levodopa vs. intraduodenal in cognition and mood).

 - Neuropsychiatric disorders.
 - Prospective study: new method of music therapy in apathy and depression.
 - Choral singing in patients with PD. Study on its effects on apathy and depression.
 - Effects of Mindfulness on the Presence and Development of TCI.
 - Natural history and neural correlates of psychotic symptoms in PD patients.

Advanced PD

Nutritional analysis in patients with intraduodenal levodopa.

 - Prospective study of cognitive, behavioural, sleep and quality of life in patients with deep brain stimulation (DBS) and intraduodenal levodopa.
 - Prospective study of patient satisfaction after DBS.
- 3. Tremor
 - Development of a tremor diagnostic system using a mobile app and software. Joint project with the Mediktor company.
 - Perampanel in essential tremor. "Real life" study.
- 4. Other neurodegenerative diseases
 - Neural correlates of hypofrontality in different subtypes of progressive supranuclear palsy (PSP).
 - Neuropsychiatric and behavioural symptoms in PSP subtypes.
 - FXTAS: collaborative research with Genetics from Hospital Clínic (Barcelona) and Associació Catalana X Fràgil (ACXF).
 - Collaboration with GEMT-CAT (Movement Disorders Group Catalan Neurology Society) in the Consensus Document on Genetics in Movement Disorders.
- 5. Neuroimaging and data engineering
 - Dynamic connectivity models in cognitive impairment in PD. In collaboration with Center for Brain and Cognition, Pompeu Fabra University, Barcelona.

- Neuroimaging and neurophysiology of hallucinations in PD: Project: "Unravelling dysfunctional brain networks in patients with Parkinson's disease suffering from hallucinations", in collaboration with Prof. Blanke, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.
- Effects of dopaminergic treatment of PD on neurocognitive networks. Collaborative study with Hospital del Mar, Barcelona.
- Functional and structural brain correlates in HD: cognition, apathy, depression, irritability, biomarkers, oxytocin levels. Collaborative study with Hospital de Burgos (HUBU).
- Analysis of collaborative databases ("big-data"): ENROLL (EH), PPMI (EP), COPPADIS (EP).
- Analysis of local databases: PSP, EH, EP.
- 6. Parkinson's disease and other movement disorders' laboratory
- Processing, biobanking and biomarker analyses of human liquid biological samples (plasma, serum, CSF and urine) from different movement disorders.
- Development and optimisation of methods for extracellular vesicle isolation from different biofluids in movement disorders.
- Identification of molecular signatures in brain, plasma, CSF and urine extracellular vesicles in Huntington's disease to improve disease prognosis and stratification of patients in clinical trials.
- To explore the clinical utility of the determination of tau and phosphorylated alpha-synuclein in skin tissue, for the early and differential diagnosis of Atypical Parkinsonian Syndromes.
- social i cognitiu. CX23-00002. Fundació La Caixa. Duration: 2024-2026. 5.280,00 €
- Kulisevsky Bojarski, Jaime. Desarrollo y validación de instrumentos específicos de evaluación cognitiva basados en la biología de la enfermedad de Huntington. PI21/01758. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 244.420,00 €
- Kulisevsky Bojarski, Jaime. Malaltia de Parkinson i trastorns del moviment. 2022 INV-1 00048. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 66.217,84 €
- Kulisevsky Bojarski, Jaime. Ensayo clínico multicéntrico, aleatorizado, doble ciego y controlado por placebo, de evaluación de la eficacia y la seguridad del donepezilo versus placebo en el deterioro cognitivo leve asociado a la Enfermedad de Parkinson. ICI22/00082. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2026. 575.328,45 €
- Kulisevsky Bojarski, Jaime. Investigación y desarrollo de una nueva terapia para el tratamiento de la enfermedad de Huntington. CPP2022-009575. Ministerio de Ciencia e Innovación (MICIIN). Duration: 2023-2026. 312.446,20 €
- Kulisevsky Bojarski, Jaime. Contratos para la intensificación de la actividad investigadora en el Sistema Nacional de Salud 2023. INT23/00090. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2024. 30.000,00 €
- Olmedo Saura, Gonzalo. Contratos Río Hortega 2024. CM24/00023. Instituto de Salud Carlos III (ISCIII). Duration: 2025-2027. 65.000,00 €
- Ruiz Barrio, Iñigo. Contratos Río Hortega 2022. CM22/00072. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2024. 65.000,00 €

ACTIVE & AWARDED GRANTS

- Aracil Bolanos, Ignacio. Contratos Juan Rodés 2022. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2026. 180.000,00 €
- García Sánchez, Carmen. Dramatitzant la salut: el paper del teatre per al benestar emocional,

DOCTORAL THESES DEFENDED

- Campolongo Perillo, Antonia. Infusión intestinal continua de levodopa/carbidopa en la enfermedad de Parkinson: factores concomitantes digestivos que influyen en su eficacia y seguridad. 16/10/2024.

- Universitat Autònoma de Barcelona.
Supervisors: Kulisevsky Bojarski, Jaime;
Pascual Sedano, Berta M.; Román Abal, Eva
María; Martí Fábregas, Joan. <https://hdl.handle.net/10803/692806>
- España Irla, María Goretti. Relationship between cardiorespiratory fitness, cognition, structural and functional brain health in middle-aged adults. 21/02/2024. Universitat Autònoma de Barcelona. Supervisors: Morris, Timothy P.; Albu, Sergiu; Kulisevsky Bojarski, Jaime. <https://hdl.handle.net/10803/691592>
 - Horta Barba, Andrea. Desarrollo y validación de nuevas herramientas para la evaluación cognitiva en la enfermedad de Huntington. 20/02/2024. Universitat Autònoma de Barcelona. Supervisors: Kulisevsky Bojarski, Jaime; Pagonabarraga Mora, Javier. <https://hdl.handle.net/10803/691596>
 - Busteed L, García C, Pascual B, Grunden N, Gironell A, Kulisevsky J, Pagonabarraga J. Impact of Stimulation Frequency on Verbal Fluency Following Bilateral Subthalamic Nucleus Deep Brain Stimulation in Parkinson's Disease. ARCHIVES OF CLINICAL NEUROPSYCHOLOGY. 2024; DOI:10.1093/arclin/aca062. PMID:39127889. IF:2,100 (Q2/5D). Document type: Article.
 - Chia R, Ray A, Shah Z, Ding J, Ruffo P, Fujita M, Menon V, Saez S, Reho P, Kaivola K, Walton RL, Reynolds RH, Karra R, Sait S, Akcimen F, Díez M, Álvarez I, Fanciulli A, Stefanova N, Seppi K, Duerr S, Leys F, Krismer F, Sidoroff V, Zimprich A, Pirker W, Rascol O, Foubert A, Meissner WG, Tison F, Pavy A, Pellicchia MT, Barone P, Russillo MC, Marín J, Kulisevsky J, Torres S, Mir P, Periñán MT, Proukakis C, Chelban V, Wu L, Goh YY, Parkkinen L, Hu MT, Kobylecki C, Saxon JA, Rollinson S, Garland E, Biaggioni I, Litvan I, Rubió I, Alcalay RN, Kwei KT, Lubbe SJ, Mao QW, Flanagan ME, Castellani RJ, Khurana V, Ndayisaba A, Calvo A, Mora G, Canosa A, Floris G, Bohannon RC, Moore A, Norcliffe L, Palma JA, Kaufmann H, Kim C, Iba M, Masliah E, Dawson TM, Rosenthal LS, Pantelyat A, Albert MS, Pletnikova O, Troncoso JC, Infante J, Lage C, Sánchez P, Serrano GE, Beach TG, Pastor P, Morris HR, Albani D, Clarimon J, Wenning GK, Hardy JA, Ryten M, Topol E, Torkamani A, Chio A, Bennett DA, De Jager PL, Low PA, Singer W, Cheshire WP, Wszolek ZK, Dickson DW, Traynor BJ, Gibbs JR, Dalgard CL, Ross OA, Houlden H, Scholz SW. Genome sequence analyses identify novel risk loci for multiple system atrophy. NEURON. 2024; 112(13). DOI:10.1016/j.neuron.2024.04.002. PMID:38701790. IF:14,700 (Q1/1D). Document type: Article.
 - Daniels C, Rodríguez-Antigüedad J, Jentschke E, Kulisevsky J, Volkmann J. Cognitive disorders in advanced Parkinson's disease: challenges in the diagnosis of delirium. Neurol Res Pract. 2024; 6(1):14. DOI:10.1186/s42466-024-00309-4. PMID:38481336. IF:3,600 (Q1/3D). Document type: Review.
 - de la Riva P, Marta J, Rodríguez J, Bergareche A, de Munain AL. Understanding Endothelial

SCIENTIFIC PRODUCTION

- Aibar JÁ, Villalba G, Freixer B, Araus E, Morollón Sánchez N, Belvis R, Revuelta M, Molet J, García C, de Quintana C, Muñoz F, Rodríguez R. Long-Term Results of Cortical Motor Stimulation for Neuropathic Peripheral and Central Pain: Real-World Evidence From Two Independent Centers. Neurosurgery. 2024; 94(1). DOI:10.1227/neu.0000000000002638. PMID:37638720. IF:3,900 (Q1/1D). Document type: Article.
- Aracil-Bolaños I, Pérez-Pérez J, Martínez-Horta S, Horta-Barba A, Puig-Davi A, García-Cornet J, Olmedo-Saura G, Campolongo A, Pagonabarraga J, Kulisevsky J. Baseline Large-Scale Network Dynamics Associated with Disease Progression in Huntington's Disease. Mov Disord. 2024; 39(1):197-203. DOI:10.1002/mds.29655. PMID:38148511. IF:7,400 (Q1/1D). Document type: Article.
- Berzosa I, Martínez S, Pérez J, Kulisevsky J, Pagonabarraga J. Therapeutic Approach to Primary Tic Disorders and Associated Psychiatric Comorbidities. Brain Sciences. 2024; 14(12):1231. DOI:10.3390/brainsci14121231. PMID:39766430. IF:2,700 (Q3/6D). Document type: Article.

- Dysfunction and Its Role in Ischemic Stroke After the Outbreak of Recanalization Therapies. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2024; 25(21):11631. DOI:10.3390/ijms252111631. PMID:39519182. IF:4,900 (Q1/3D). Document type: Review.
- Dellarole IL, Vacchi E, Ruiz I, Pinton S, Raimondi A, Rossi S, Morandi S, Bianco G, Bacinoglu MB, Lombardo A, Celauro L, Staedler C, Galati S, Pagonabarraga J, Kulisevsky J, Legname G, Gobbi C, Kaelin A, Moda F, Melli G. Tau seeding activity in skin biopsy differentiates tauopathies from synucleinopathies. *npj Parkinsons Disease*. 2024; 10(1):116. DOI:10.1038/s41531-024-00728-9. PMID:38879633. IF:6,700 (Q1/1D). Document type: Article.
 - Fernández JM, Aracil I, García C, Campolongo A, Curell M, Rodríguez R, Aibar JA, Kulisevsky J, Pascual B. Cognitive phenotyping of *GBA1*-Parkinson's disease: A study on deep brain stimulation outcomes. *PARKINSONISM & RELATED DISORDERS*. 2024; 128:107127. DOI:10.1016/j.parkreldis.2024.107127. PMID:39357432. IF:3,100 (Q2/4D). Document type: Article.
 - Fernández JM, Olmedo G, Querol LA, Kulisevsky J, Pérez J. Crossed-reflex in antiphospholipid chorea. *NEUROLOGICAL SCIENCES*. 2024; 45(9). DOI:10.1007/s10072-024-07622-5. PMID:38896185. IF:2,700 (Q2/4D). Document type: Article.
 - Garon M, Weis L, Siquier A, Fiorenzato E, Pistonesi F, Cianci V, Canesi M, Pesce F, Reali E, Pozzi B, Isaías IU, Siri C, Santangelo G, Cuoco S, Barone P, Kulisevsky J, Antonini A, Biundo R. Validation of the Italian version of the Parkinson's Disease- Cognitive Functional Rating Scale. *JOURNAL OF NEURAL TRANSMISSION*. 2024; 131(4). DOI:10.1007/s00702-024-02746-6. PMID:38280057. IF:3,200 (Q2/3D). Document type: Article.
 - Gironell A, Marín J, Póveda S. Essential Tremor: Update of Therapeutic Strategies. *MEDICINA CLINICA*. 2024; 162(12). DOI:10.1016/j.medcli.2023.12.013. PMID:38553256. IF:2,600 (Q1/3D). Document type: Article.
 - González B, Happé F, Nicholson TR, Morgante F, Pagonabarraga J, Deeley Q, Edwards MJ. Functional Neurological Disorder and Autism Spectrum Disorder: A Complex and Potentially Significant Relationship. *Brain and Behavior*. 2024; 14(12):e70168. DOI:10.1002/brb3.70168. PMID:39705515. IF:2,600 (Q2/3D). Document type: Review.
 - Grunden N, Calabria M, García C, Pons C, Arroyo JA, Gómez B, Estévez MD, Belvís R, Morollón N, Cordero M, Mur I, Pomar V, Domingo P. Evolving trends in neuropsychological profiles of post COVID-19 condition: A 1-year follow-up in individuals with cognitive complaints. *PLoS One*. 2024; 19(8):e0302415. DOI:10.1371/journal.pone.0302415. PMID:39116061. IF:2,900 (Q1/3D). Document type: Article.
 - Herrero M, Pérez J, Escaramís G, Martínez S, Pérez R, Rivas E, Kulisevsky J, Gámez A, Martí E. Small RNAs in plasma extracellular vesicles define biomarkers of premanifest changes in Huntington's disease. *Journal of Extracellular Vesicles*. 2024; 13(10):e12522. DOI:10.1002/jev2.12522. PMID:39377487. IF:15,500 (Q1/1D). Document type: Article.
 - Kassubek J, Factor SA, Balaguer E, Schwarz J, Chaudhuri KR, Isaacson SH, Wu S, Muhr CD, Kulisevsky J. Long-term safety, tolerability and efficacy of apomorphine sublingual film in patients with Parkinson's disease complicated by OFF episodes: a phase 3, open-label study. *JOURNAL OF NEUROLOGY*. 2024; 271(6). DOI:10.1007/s00415-024-12323-2. PMID:38546829. IF:4,800 (Q1/2D). Document type: Article.
 - Kulisevsky J, Ferraz HB, Suppa A, Reichmann H. Effects of Safinamide on Motor and Non-Motor Symptoms in Patients with Parkinson's Disease and Motor Fluctuations. *EUROPEAN NEUROLOGY*. 2024; 87(5-6). DOI:10.1159/000541362. PMID:39342935. IF:2,100 (Q3/6D). Document type: Review.
 - Martínez S, Pérez J, Pérez R, Sampedro F, Horta A, Campolongo A, Rivas E, Puig A, Pagonabarraga J, Kulisevsky J. Cognitive phenotype and neurodegeneration associated with Tau in Huntington's disease.

- Annals of Clinical and Translational Neurology. 2024; 11(5). DOI:10.1002/acn3.52031. PMID:38544341. IF:4,400 (Q1/2D). Document type: Article.
- Pagonabarraga J, Bejr H, Martínez S, Kulisevsky J. Parkinson disease psychosis: from phenomenology to neurobiological mechanisms. Nature Reviews Neurology. 2024; 20(3). DOI:10.1038/s41582-023-00918-8. PMID:38225264. IF:28,200 (Q1/1D). Document type: Review.
 - Pérez J, García S, Valle TF, Painous C, Querol MR, Ruiz PJG, Diago EB, Delgado EC, Pastor BV, Villaplana MCP, Santana IM, Estrada MB, Garride MC, Ribera PM, Álvarez C, Maurino J, de Prado A, López JL. Huntington Disease Health Related Quality of Life, Function and Well Being: The Patient's Perspective. Neurology and Therapy. 2024; DOI:10.1007/s40120-024-00655-0. PMID:39370480. IF:3,900 (Q1/2D). Document type: Article.
 - Puig A, Martínez S, Pérez L, Horta A, Ruiz I, Aracil I, Pérez R, Rivas E, Sampedro F, Campolongo A, Pagonabarraga J, Kulisevsky J. Prediction of Cognitive Heterogeneity in Parkinson's Disease: A 4-Year Longitudinal Study Using Clinical, Neuroimaging, Biological and Electrophysiological Biomarkers. ANNALS OF NEUROLOGY. 2024; 96(5). DOI:10.1002/ana.27035. PMID:39099459. IF:8,100 (Q1/1D). Document type: Article.
 - Rodríguez J, Martínez S, Horta A, Puig A, Campolongo A, Sampedro F, Bejr H, Marín J, Pagonabarraga J, Kulisevsky J. Facial emotion recognition deficits are associated with hypomimia and related brain correlates in Parkinson's disease. JOURNAL OF NEURAL TRANSMISSION. 2024; 131(12). DOI:10.1007/s00702-023-02725-3. PMID:38206439. IF:3,200 (Q2/3D). Document type: Article.
 - Ruiz I, Horta A, Aracil I, Martínez S, Kulisevsky J, Pagonabarraga J. Predicting Disability in Progressive Supranuclear Palsy Using Bedside Frontal-Lobe Signs. Movement Disorders Clinical Practice. 2024; 11(3). DOI:10.1002/mdc3.13958. PMID:38164060. IF:2,600 (Q2/5D). Document type: Article.
 - Ruiz I, Vázquez A, Puig A, Rivas E, Pérez J, Fernández C, Horta A, Olmedo G, Salvat N, Sampedro F, Vacchi E, Melli G, Pagonabarraga J, Kulisevsky J, Martínez S. Skin Tau Quantification as a Novel Biomarker in Huntington's Disease. MOVEMENT DISORDERS. 2024; 39(11). DOI:10.1002/mds.29989. PMID:39192729. IF:7,400 (Q1/1D). Document type: Article.
 - Salvat N, Vázquez A, Rivas E, Herrero M, Gámez A, Pérez J, Izquierdo C, Campolongo A, Martí E, Kulisevsky J, Pérez R. Methodological Assessment of ExoGAG for Isolation of Cerebrospinal Fluid Extracellular Vesicles as a Source of Biomarkers. INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES. 2024; 25(24):13705. DOI:10.3390/ijms252413705. PMID:39769471. IF:4,900 (Q1/3D). Document type: Article.
 - Santos D, de Deus T, Cores C, Paineiras MJF, Alvarado M, Samaniego LB, Maside AL, Jesús S, Cosgaya M, Caldentey JG, Caballol N, Legarda I, Hernández J, López IC, Manzanares LL, González I, Avila A, Gómez V, Nogueira V, García JD, Borrue C, Solano B, Sauco MA, Vela L, Escalante S, Cubo E, Mendoza Z, Parees I, Alonso PS, Losada M, López N, Gaston I, Kulisevsky J, Seijo M, Valero C, Redondo RA, Buongiorno MT, Ordas C, Menéndez M, McAfee D, Martínez P, Mir P. Levodopa-Induced Dyskinesias are Frequent and Impact Quality of Life in Parkinson's Disease: A 5-Year Follow-Up Study. Movement Disorders Clinical Practice. 2024; 11(7). DOI:10.1002/mdc3.14056. PMID:38747234. IF:2,600 (Q2/5D). Document type: Article.