



Maria Inmaculada Cobos Sillero

Assistant Professor of Pathology at the Stanford University Medical Center

 NIH Biosketch available Online

CLINICAL OFFICES

- **Pathology Department**

300 Pasteur Dr R241

MC 5324

Stanford, CA 94305

Tel (650) 725-8200

Fax (650) 498-5394

Bio

BIO

Inma Cobos is a physician scientist recently recruited to Stanford in the Department of Pathology. She is a neuropathologist and neuroscientist with expertise in neurodegeneration.

Inma received her medical and doctoral degrees from the University of Murcia in Spain and completed post-doctoral training in Developmental Neurobiology at the University of California, San Francisco. She then pursued a clinical residency and fellowship in Anatomic Pathology and Neuropathology at Massachusetts General Hospital, Harvard Medical School. Before joining Stanford, she was an Assistant Professor in the Department of Pathology and Neuropathology at the UCLA David Geffen School of Medicine.

Her research program combines her background in diagnostic neuropathology, knowledge of developmental neuroscience, and state-of-the-art cellular and molecular technologies to advance the understanding of Alzheimer's disease and related dementias. She is currently applying single-cell methods to human brain to dissect the contributions of distinct cell types to Alzheimer's disease pathogenesis and investigate the mechanisms of tau-mediated neurodegeneration in human brain. Her work is supported by the NIH National Institute of Aging (R01), the Alzheimer's Association, and BrightFocus. She recently received the Ben Barres Early Career Acceleration Award from the Chan Zuckerberg Initiative (CZI).

CLINICAL FOCUS

- Anatomic Pathology
- Neuropathology

ACADEMIC APPOINTMENTS

- Assistant Professor - Med Center Line, Pathology
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Ben Barres Early Career Acceleration Award, Chan Zuckerberg Initiative (2018)
- Research Career Development Award, Stop Cancer (2016)
- NAAR Postdoctoral Fellowship, National Alliance for Autism Research/Autism Speaks (2004–2006)
- NARSAD Young Investigator Award, National Alliance for Research on Schizophrenia and Depression (2003–2005)
- Postdoctoral Fellowship, Spanish Ministry of Education and Science (2001-2003)
- Doctoral Extraordinary Prize, University of Murcia, Spain (2001)
- Neuroscience Master's Student Fellowship, International University of Andalusia, Spain (1997)
- Predoctoral Fellowship, Government of Murcia, Spain (1996–2000)

PROFESSIONAL EDUCATION

- Board Certification: Neuropathology, American Board of Pathology (2015)
- Board Certification: Anatomic Pathology, American Board of Pathology (2015)
- Fellowship: Massachusetts General Hospital Dept of Pathology (2015) MA
- Residency: Massachusetts General Hospital Dept of Pathology (2013) MA
- PhD, University of Murcia School of Medicine, Spain (2000)
- Medical Education: University of Murcia School of Medicine (1996) Spain

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our lab uses cellular and molecular methods, single-cell technology, and quantitative histology to study human neurodegenerative diseases. Current projects include:

- Using single-cell RNA-sequencing to understand selective vulnerability and disease progression in human Alzheimer's disease brain
- Investigating mechanisms of tau-related neurodegeneration in human brain
- Studying the neocortical and limbic systems in Diffuse Lewy Body Disease (DLBD) at the single cell level

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Yue Dong, Chelsey LeBlang, Jie Pan, Sameehan Uday Mahajani, Debia Wakhloo

Publications

PUBLICATIONS

- **Molecular signatures underlying neurofibrillary tangle susceptibility in Alzheimer's disease** *In review*
Otero-Garcia, M., Xue, Y., Shakouri, T., Yong, Y., Morabito, S., Kawaguchi, R., Swarup, V., Cobos, I.
2019
- **Nav1.1-Overexpressing Interneuron Transplants Restore Brain Rhythms and Cognition in a Mouse Model of Alzheimer's Disease.** *Neuron*
Martinez-Losa, M., Tracy, T. E., Ma, K., Verret, L., Clemente-Perez, A., Khan, A. S., Cobos, I., Ho, K., Gan, L., Mucke, L., Alvarez-Dolado, M., Palop, J. J.

2018; 98 (1): 75–89.e5

- **Human von Economo neurons express transcription factors associated with Layer V subcerebral projection neurons.** *Cerebral cortex (New York, N.Y. : 1991)*
Cobos, I., Seeley, W. W.
2015; 25 (1): 213–20
- **Inhibitory interneuron deficit links altered network activity and cognitive dysfunction in Alzheimer model.** *Cell*
Verret, L., Mann, E. O., Hang, G. B., Barth, A. M., Cobos, I., Ho, K., Devidze, N., Maslah, E., Kreitzer, A. C., Mody, I., Mucke, L., Palop, J. J.
2012; 149 (3): 708–21
- **Step-by-step in situ hybridization method for localizing gene expression changes in the brain.** *Methods in molecular biology (Clifton, N.J.)*
Palop, J. J., Roberson, E. D., Cobos, I.
2011; 670: 207–30
- **Dlx transcription factors promote migration through repression of axon and dendrite growth** *NEURON*
Cobos, I., Borello, U., Rubenstein, J. R.
2007; 54 (6): 873–88
- **Mice lacking Dlx1 show subtype-specific loss of interneurons, reduced inhibition and epilepsy.** *Nature neuroscience*
Cobos, I., Calcagnotto, M. E., Vilaythong, A. J., Thwin, M. T., Noebels, J. L., Baraban, S. C., Rubenstein, J. L.
2005; 8 (8): 1059–68
- **Origins of cortical interneuron subtypes.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
Xu, Q., Cobos, I., De La Cruz, E., Rubenstein, J. L., Anderson, S. A.
2004; 24 (11): 2612–22
- **Hepatic arginase deficiency fosters dysmyelination during postnatal CNS development.** *JCI insight*
Liu, X., Haney, J. R., Cantero, G., Lambert, J. R., Otero-Garcia, M., Truong, B., Gropman, A., Cobos, I., Cederbaum, S. D., Lipshutz, G. S.
2019; 4 (17)
- **Dlx1 and Dlx2 Promote Interneuron GABA Synthesis, Synaptogenesis, and Dendritogenesis.** *Cerebral cortex (New York, N.Y. : 1991)*
Pla, R., Stanco, A., Howard, M. A., Rubin, A. N., Vogt, D., Mortimer, N., Cobos, I., Potter, G. B., Lindtner, S., Price, J. D., Nord, A. S., Visel, A., Schreiner, et al
2018; 28 (11): 3797–3815
- **GABAergic Interneuron Differentiation in the Basal Forebrain Is Mediated through Direct Regulation of Glutamic Acid Decarboxylase Isoforms by Dlx Homeobox Transcription Factors.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
Le, T. N., Zhou, Q. P., Cobos, I., Zhang, S., Zagozewski, J., Japioni, S., Vriend, J., Parkinson, T., Du, G., Rubenstein, J. L., Eisenstat, D. D.
2017; 37 (36): 8816–29
- **A 63-Year-Old Man With Progressive Visual Symptoms.** *JAMA neurology*
Mitchell, S. B., Lucente, D., Larvie, M., Cobos, M. I., Frosch, M., Dickerson, B. C.
2017; 74 (1): 114–18
- **CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL. Case 23-2015. A 51-Year-Old Woman with Headache, Cognitive Impairment, and Weakness.** *The New England journal of medicine*
Batchelor, T. T., Chen, Y. B., Rapalino, O., Cobos, I.
2015; 373 (4): 367–77
- **Influence of a Subtype of Inhibitory Interneuron on Stimulus-Specific Responses in Visual Cortex** *CEREBRAL CORTEX*
Mao, R., Schummers, J., Knoblich, U., Lacey, C. J., Van Wart, A., Cobos, I., Kim, C., Huguenard, J. R., Rubenstein, J. L., Sur, M.
2012; 22 (3): 493–508
- **A mutation in the pericentrin gene causes abnormal interneuron migration to the olfactory bulb in mice.** *Developmental biology*
Endoh-Yamagami, S., Karkar, K. M., May, S. R., Cobos, I., Thwin, M. T., Long, J. E., Ashique, A. M., Zarbalis, K., Rubenstein, J. L., Peterson, A. S.
2010; 340 (1): 41–53
- **Dlx1&2 and Mash1 transcription factors control MGE and CGE patterning and differentiation through parallel and overlapping pathways.** *Cerebral cortex (New York, N.Y. : 1991)*
Long, J. E., Cobos, I., Potter, G. B., Rubenstein, J. L.
2009; 19 Suppl 1: i96–106

- **Dlx1&2 and Mash1 transcription factors control striatal patterning and differentiation through parallel and overlapping pathways.** *The Journal of comparative neurology*
Long, J. E., Swan, C., Liang, W. S., Cobos, I., Potter, G. B., Rubenstein, J. L.
2009; 512 (4): 556–72
- **FGF15 promotes neurogenesis and opposes FGF8 function during neocortical development.** *Neural development*
Borello, U., Cobos, I., Long, J. E., McWhirter, J. R., Murre, C., Rubenstein, J. L.
2008; 3: 17
- **Transcriptional regulation of cortical interneuron development.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
Butt, S. J., Cobos, I., Golden, J., Kessar, N., Pachnis, V., Anderson, S.
2007; 27 (44): 11847–50
- **Chicken lateral septal organ and other circumventricular organs form in a striatal subdomain abutting the molecular striatopallidal border.** *The Journal of comparative neurology*
Bardet, S. M., Cobos, I., Puellas, E., Martínez-De-La-Torre, M., Puellas, L.
2006; 499 (5): 745–67
- **Cellular patterns of transcription factor expression in developing cortical interneurons.** *Cerebral cortex (New York, N.Y. : 1991)*
Cobos, I., Long, J. E., Thwin, M. T., Rubenstein, J. L.
2006; 16 Suppl 1: i82–8
- **Severe hearing loss in Dlx1 mutant mice.** *Hearing research*
Polley, D. B., Cobos, I., Merzenich, M. M., Rubenstein, J. L.
2006; 214 (1-2): 84–88
- **The vertebrate ortholog of Aristaless is regulated by Dlx genes in the developing forebrain.** *The Journal of comparative neurology*
Cobos, I., Broccoli, V., Rubenstein, J. L.
2005; 483 (3): 292–303
- **Graded phenotypic response to partial and complete deficiency of a brain-specific transcript variant of the winged helix transcription factor RFX4.** *Development (Cambridge, England)*
Blackshear, P. J., Graves, J. P., Stumpo, D. J., Cobos, I., Rubenstein, J. L., Zeldin, D. C.
2003; 130 (19): 4539–52
- **Fate map of the avian anterior forebrain at the four-somite stage, based on the analysis of quail-chick chimeras.** *Developmental biology*
Cobos, I., Shimamura, K., Rubenstein, J. L., Martínez, S., Puellas, L.
2001; 239 (1): 46–67
- **The avian telencephalic subpallium originates inhibitory neurons that invade tangentially the pallium (dorsal ventricular ridge and cortical areas).** *Developmental biology*
Cobos, I., Puellas, L., Martínez, S.
2001; 239 (1): 30–45
- **Monofocal origin of telencephalic oligodendrocytes in the anterior entopeduncular area of the chick embryo.** *Development (Cambridge, England)*
Olivier, C., Cobos, I., Perez Villegas, E. M., Spassky, N., Zalc, B., Martínez, S., Thomas, J. L.
2001; 128 (10): 1757–69
- **The early steps of oligodendrogenesis: insights from the study of the plp lineage in the brain of chicks and rodents.** *Developmental neuroscience*
Spassky, N., Olivier, C., Cobos, I., LeBras, B., Goujet-Zalc, C., Martínez, S., Zalc, B., Thomas, J. L.
2001; 23 (4-5): 318–26
- **Spatiotemporal development of oligodendrocytes in the embryonic brain.** *Journal of neuroscience research*
Thomas, J. L., Spassky, N., Perez Villegas, E. M., Olivier, C., Cobos, I., Goujet-Zalc, C., Martínez, S., Zalc, B.
2000; 59 (4): 471–76
- **FGF8 induces formation of an ectopic isthmus organizer and isthmocerebellar development via a repressive effect on Otx2 expression.** *Development (Cambridge, England)*
Martinez, S., Crossley, P. H., Cobos, I., Rubenstein, J. L., Martin, G. R.
1999; 126 (6): 1189–1200

- **Calretinin in pretecto- and olivocerebellar projections in the chick: immunohistochemical and experimental study.** *The Journal of comparative neurology*
De Castro, F., Cobos, I., Puelles, L., Martinez, S.
1998; 397 (2): 149–62