



SEMINARIO PRESENCIAL

Viernes, 14 de Marzo de 2025
12:30 h. Instituto Cajal - CSIC

Dra. Marta Cortes-Canteli

Centro Internacional de Neurociencia Cajal - CSIC

DECIPHERING THE VASCULAR COMPONENT OF ALZHEIMER'S DISEASE

Abstract

Alzheimer's disease (AD) is a multifactorial and severe neurodegenerative disorder for which there is no effective treatment available. This disease, characterized by amyloid- β plaques, tau tangles, and brain atrophy, also has a profound neurovascular dysfunction and brain hypoperfusion. This is partially due to a significant pro-coagulant state present in AD: fibrin, the main protein component of blood clots, is significantly increased in the AD brain and, fibrin clots are formed faster and degrade slower in AD mice. This procoagulant state plays an important role in the development and evolution of AD, since treating long-term AD mice with a direct thrombin inhibitor anticoagulant normalized cerebral perfusion and ameliorated memory loss, amyloid load, neuroinflammation, and blood-brain barrier dysfunction. Our lab is focused on understanding the molecular mechanisms underlying the vascular component, in particular the procoagulant state that contributes to AD progression, and on developing appropriate biomarkers and therapeutics. Additionally, and thanks to a collaboration agreement with the Spanish National Center for Cardiovascular Research, our group is also involved in the PESA-Brain study, an observational cohort study performed in middle-age asymptomatic individuals that is in a unique position to unveil novel relationships between cardiovascular and brain alterations in the health-to-disease transition, which may have important implications for interventional and therapeutic approaches.

Affiliation and short bio

Marta Cortes-Canteli holds Bachelor's Degrees in Biochemistry (1999) & Biology (2001), and a PhD (2004), all from Autonomous University of Madrid. Her Thesis work performed at the Instituto de Investigaciones Biomedicas of Madrid in Ana Perez-Castillo's lab received 2 Awards and focused on the role of a transcription factor in neuronal differentiation and brain injury. In 2008, she moved to The Rockefeller University (NY, USA) to study the vascular component of AD. She was chosen to be a Women & Science Fellow and a BrightFocus AD Research Fellow and obtained her first 2 grants as PI. In 2015, she returned to Spain with a Marie Curie Fellowship to start a line of investigation at the Spanish National Center for Cardiovascular Research deciphering the heart-brain connection in AD, in particular the impact of cardiovascular risk factors and atherosclerosis in middle-age on brain's function. In 2017 she was chosen to be a Miguel Servet Researcher, first at the Spanish National Center for Cardiovascular Research and then in 2022 at the Instituto de Investigacion Sanitaria Fundacion Jimenez Diaz and she expanded her interests to preclinical molecular imaging with special focus on neuroimaging, working very closely with clinicians on population-based studies. In July 2024, she obtained a permanent position as *Científico Titular* at the Cajal Internacional Neuroscience Center of CSIC where she leads the Alzheimer's Disease Neurovascular Research Laboratory.

Cortes-Canteli has obtained more than 10 grants as PI, funded by public agencies but also by private entities at the national and international level (EU and USA). With an h-index of 23 (Google Scholar), she has over 30 publications (2 Highly Cited Papers among them, as of 2024) including research articles, reviews and editorial comments. Cortes-Canteli has been nominated twice for the Top 100 Women Leaders in Spain (in 2022 & 2023) and has received twice the 2nd prize "Premio Vanguardia de la Ciencia" (X and XI Editions).

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Related publications with the topic

Toribio-Fernandez R, Tristão-Pereira C... Cortes-Canteli M (AC) & Fuster V (AC). 19/20. 2024. Apolipoprotein E-ε2 and resistance to atherosclerosis in midlife: the PESA observational study. *Circulation Res. Feb*; 134(4):411-424. PMID: 38258600.

Tristão-Pereira C, ... Gispert JD (AC) & Cortes-Canteli M (AC). 17/17. 2023. Longitudinal interplay between subclinical atherosclerosis, cardiovascular risk factors & cerebral glucose metabolism in midlife: results from the PESA prospective cohort study. *Lancet Healthy Longev. Sep*;4(9):e487-e498. PMID:37659430.

Cortes-Canteli M, Gispert, JD... Molinuevo JL (AC) & Fuster V (AC). 1/16. 2021. Subclinical atherosclerosis and brain metabolism in middle-aged individuals. The PESA study. *J. Am. Coll. Cardiol.* 77: 888–98. PMID: 3360247.2.

Cortes-Canteli M (AC), Kruyer A, ... Strickland S & Fuster V. (1/15). 2019. Long-term dabigatran treatment delays Alzheimer's disease pathogenesis in the TgCRND8 mouse model. *J. Am. Coll. Cardiol.* 74: 1910–23. PMID: 31601371.

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