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**Hospital Universitario
La Paz**
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SERVICIO DE NEUROLOGÍA

UAM
Universidad Autónoma
de Madrid

*Escuela
Ciencias Neurológicas*

IdiPAZ
Instituto de Investigación
Hospital Universitario La Paz

Área Neurociencias

Contribución de la Enfermedad Cerebrovascular a las Demencias Degenerativas. Relevancia de la Unidad Neurovascular.

03 Noviembre 2025

Elisa Alonso López

EPIDEMIOLOGÍA

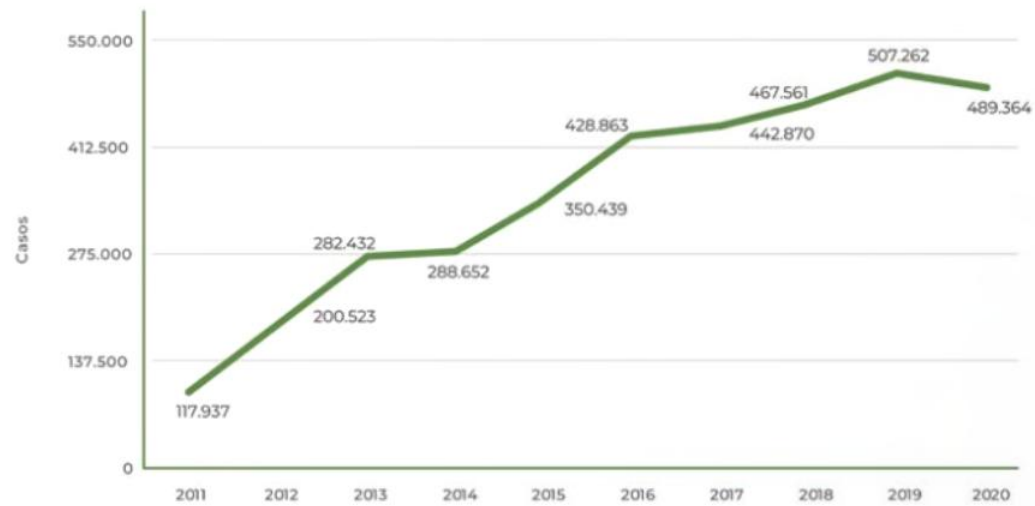


Fuente: Elaborado por CEAFA a partir de la Base de Datos de Clínicos de Atención Primaria (BDCAP).
Ministerio de Sanidad. Datos 2020. Correlación con Datos población INE 2020.

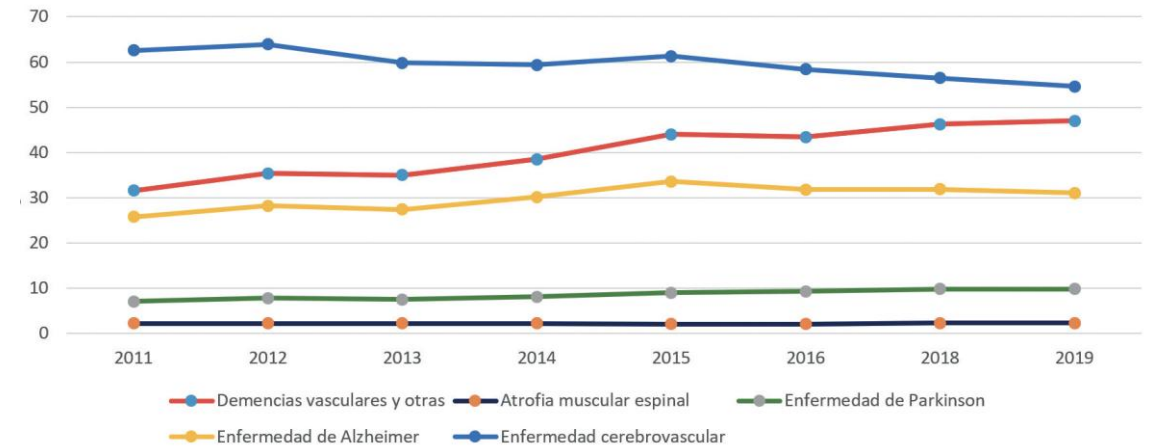
	HOMBRE		MUJER		TOTAL
01-Andalucía	32.002	21,21%	71.554	21,14%	103.556
02-Aragón	5.565	3,69%	11.243	3,32%	16.808
03-Asturias	2.349	1,56%	6.665	1,97%	9.014
04-Baleares	2.975	1,97%	7.251	2,14%	10.226
05-Canarias	5.749	3,81%	12.900	3,81%	18.649
06-Cantabria	1.286	0,85%	3.929	1,16%	5.215
07-Castilla y León	5.143	3,41%	12.553	3,71%	17.696
08-Castilla la Mancha	3.394	2,25%	7.037	2,08%	10.431
09-Cataluña	27.387	18,15%	61.632	18,21%	89.019
10-Comunidad Valenciana	28.613	18,97%	60.045	17,74%	88.658
11-Extremadura	1.386	0,92%	2.717	0,80%	4.103
12-Galicia	7.304	4,84%	18.976	5,61%	26.280
13-Madrid	15.262	10,12%	33.478	9,89%	48.740
14-Murcia	4.412	2,92%	8.595	2,54%	13.007
15-Navarra	1.656	1,10%	3.979	1,18%	5.635
16-País Vasco	5.670	3,76%	14.402	4,25%	20.072
17-La Rioja	719	0,48%	1.536	0,45%	2.255
TOTAL	150.872	100,00%	338.492	100,00%	489.364

Fuente: Elaborado por CEAFA a partir de la Base de Datos de Clínicos de Atención Primaria (BDCAP).
Ministerio de Sanidad. Datos 2020.

EPIDEMIOLOGÍA



Fuente: Elaborado por CEAFA a partir de la Base de Datos de Clínicos de Atención Primaria (BDCAP).
Ministerio de Sanidad. Portal estadístico. Datos 2011-2020.



N.º Muertes	2011	2012	2013	2014	2015	2016	2017	2018	2019
Demencia vascular y otras	14 583	16 361	16 305	17 883	20 442	20 150	21 001	21 629	22 117
E. Alzheimer	11 907	13 015	12 775	14 022	15 578	14 793	15 201	14 929	14 634

Datos del INE

- Envejecimiento de la población
- Aumento de FRV
- Deterioro cognitivo se triplique en 2050

Control de los FRV podría evitar hasta 16 millones de casos de EA

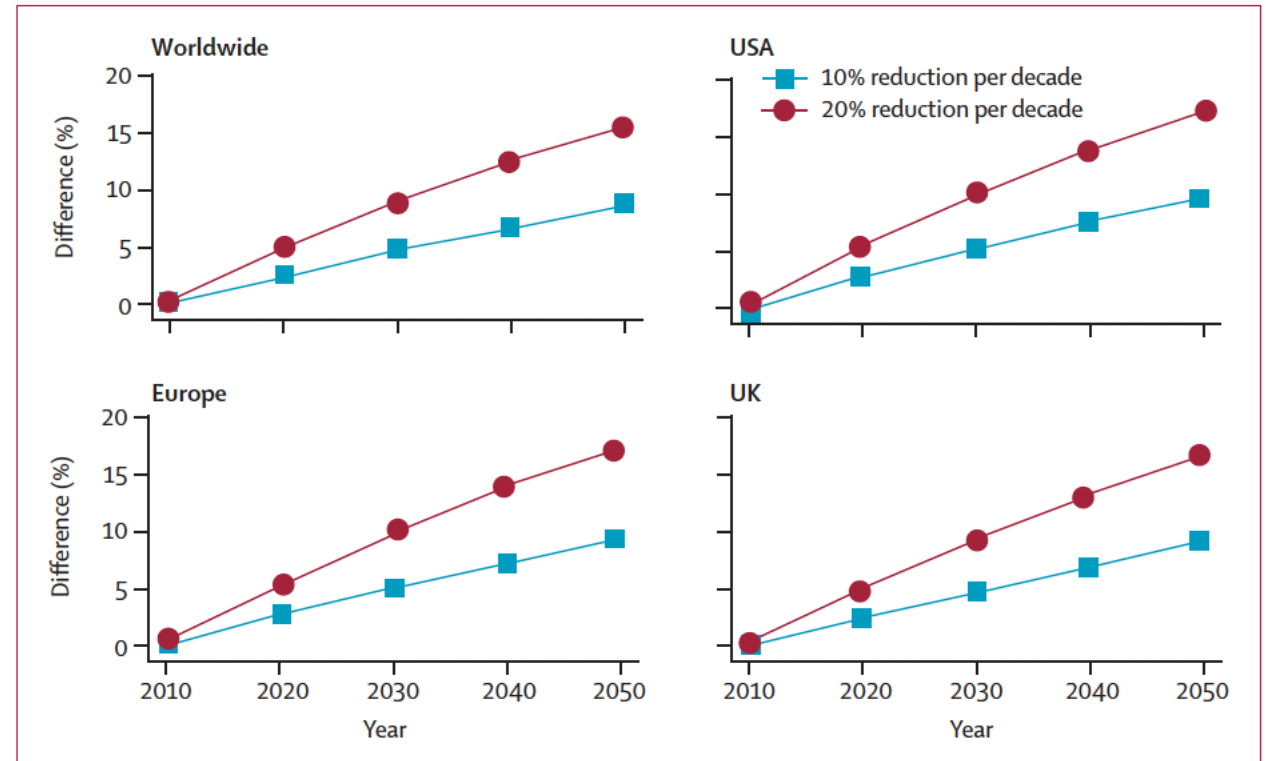
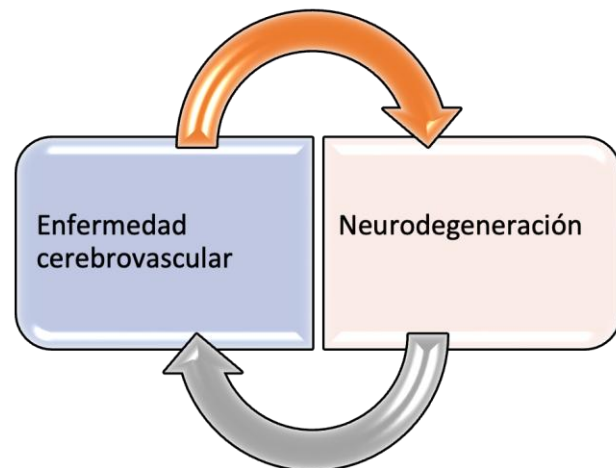
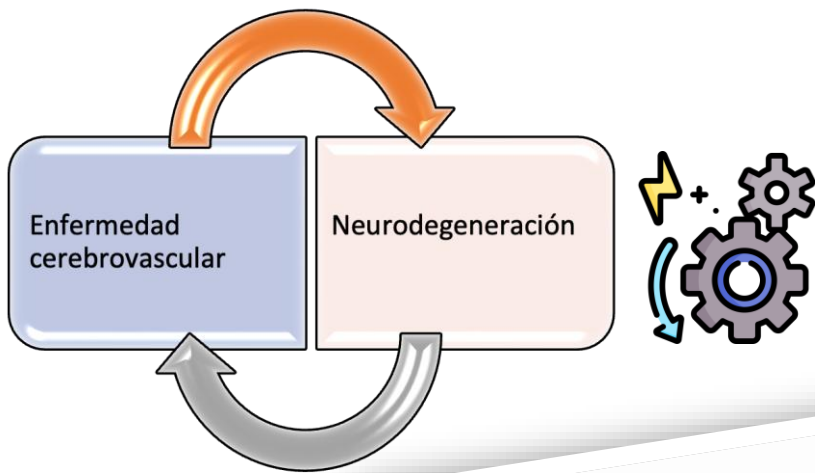


Figure: Projected percentages of Alzheimer's disease cases that could be prevented, with 10% or 20% reductions per decade in each risk factor

Norton S, et al Lancet Neurol. 2014



Hypertension, Neurodegeneration, and Cognitive Decline

Anthony Pacholko^{ID}, Costantino Iadecola^{ID}

REVIEW ARTICLE

Target risk factors for dementia prevention: a systematic review and Delphi consensus study on the evidence from observational studies

Kay Deckers¹, Martin P. J. van Boxtel¹, Olga J. G. Schiepers¹, Marjolein de Vugt¹, Juan Luis Muñoz Sánchez², L. Anstey³, Carol Brayne⁴, Jean-Francois Dartigues⁵, Knut Engedal⁶, Miia Kivipelto⁷, Karen Ritchie⁸, Yaffe¹⁰, Kate Irving^{11,1}, Frans R. J. Verhey¹ and Sebastian Köhler¹



Midlife cardiovascular risk factors and risk of dementia in late life

R.A. Whitmer, PhD; S. Sidney, MD; J. Selby, MD; S. Claiborne Johnston, MD; and K. Yaffe, MD

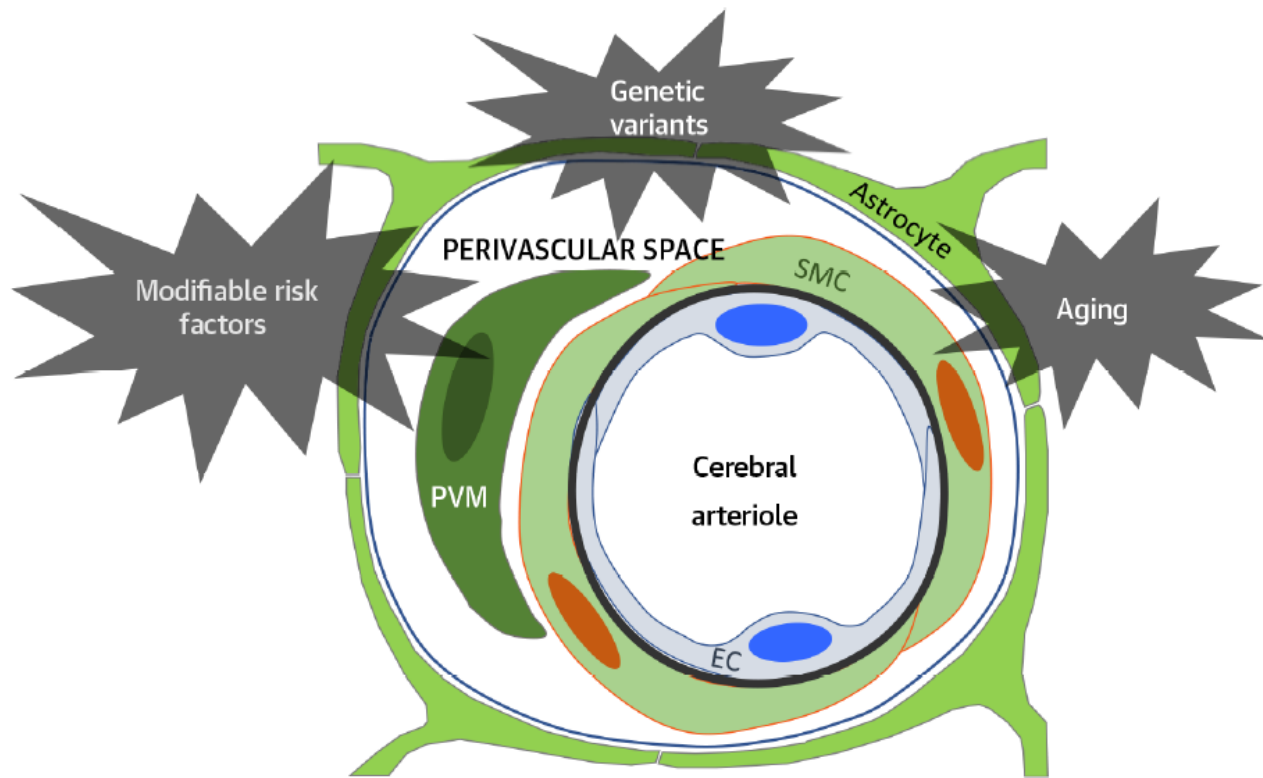
Risk factors for cognitive impairment and dementia after stroke: a systematic review and meta-analysis

Jule Filler*, Marios K Georgakis*, Martin Dichgans

Table 3 Cox proportional hazards models of cardiovascular risk factors at midlife and risk of dementia

Risk factors	Unadjusted HR (95% CI)	Adjusted for age at mid-life exam, age at start of case ascertainment, race, education, and sex, HR (95% CI)
Hypertension	1.26 (1.06–1.50)	1.24 (1.04–1.48)
Diabetes	1.64 (1.34–2.00)	1.46 (1.19–1.79)
High cholesterol	1.29 (1.11–1.50)	1.42 (1.22–1.66)
Smoking	1.22 (1.05–1.42)	1.26 (1.08–1.47)

R.A. Whitmer, Neurology
2005



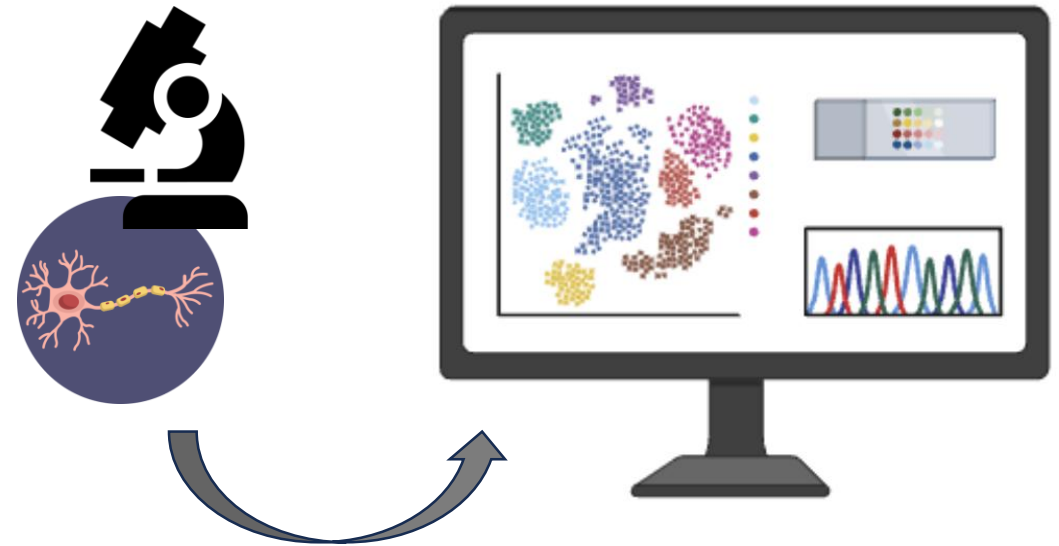
Reduced CBF BBB dysfunction Trophic failure Immune dysregulation Reduced clearance



Hypoxia Altered brain homeostasis Cell dysfunction Oxidative stress cytokines Altered proteostasis



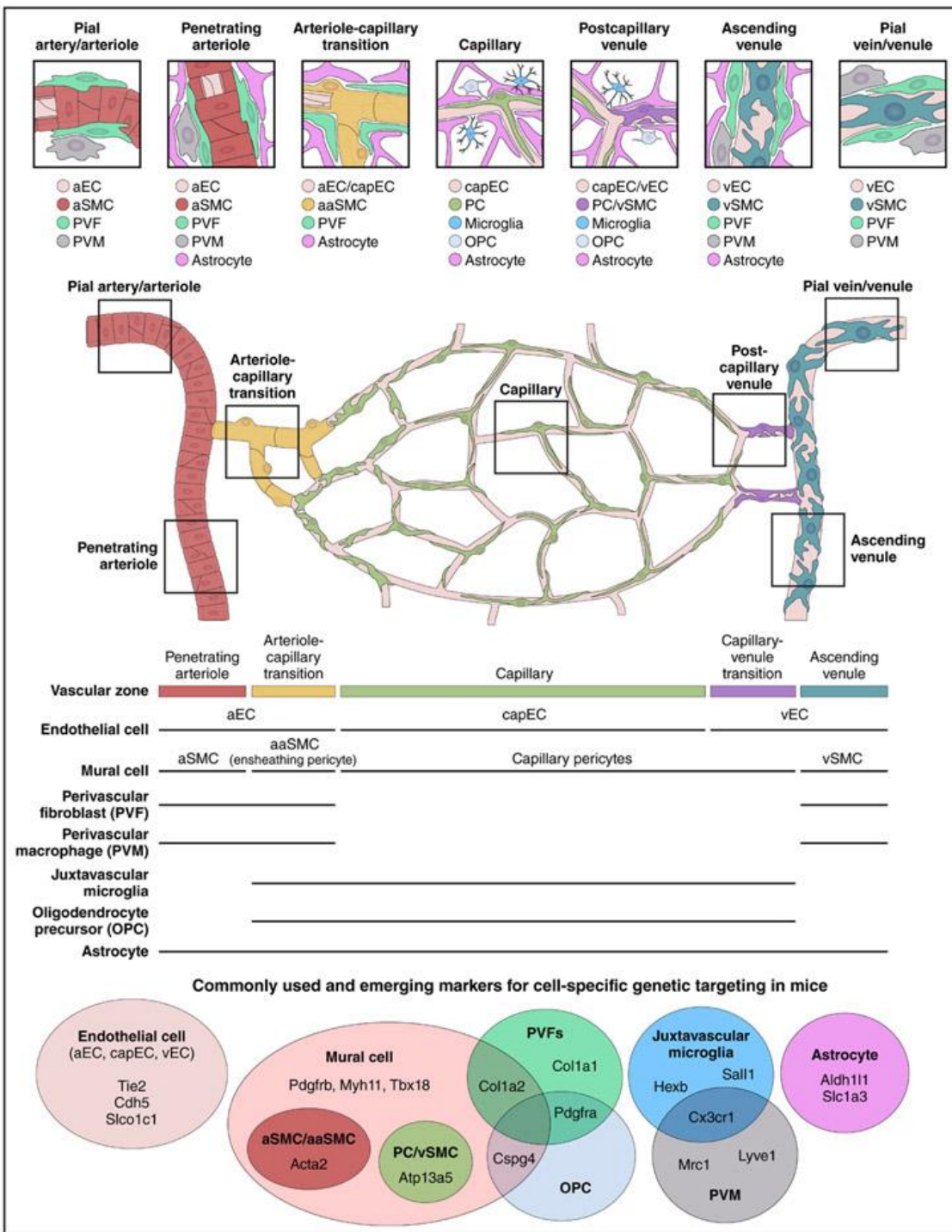
Cognitive impairment



COMUNICACIÓN
INTERCELULAR

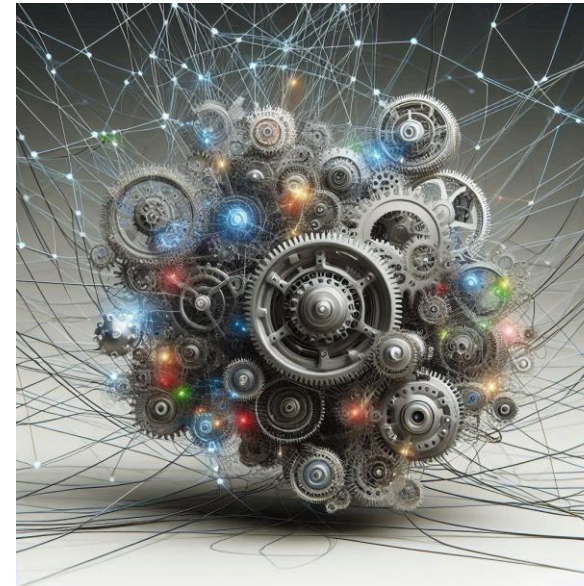


“No podemos entender el daño neuronal si sólo miramos a la neurona”



Unidad NEUROVASCULAR

COMUNICACIÓN

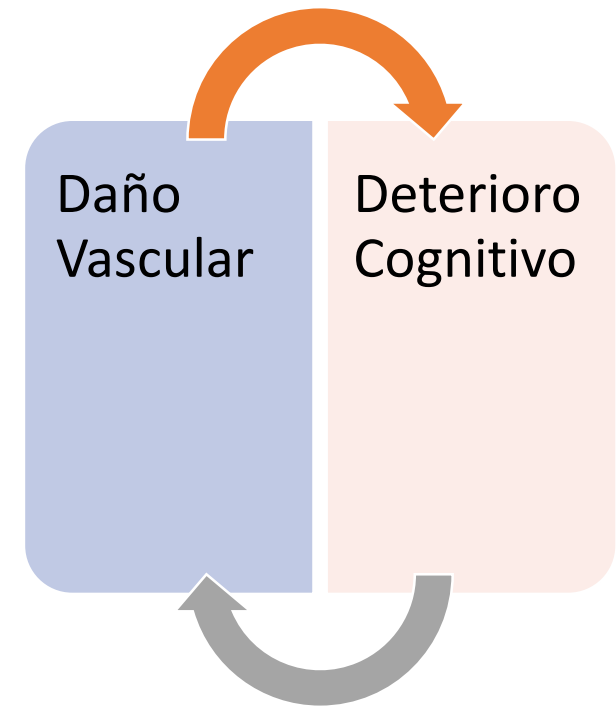


“Todo lo que afecte a la Unidad neurovascular puede producir afectación cognitiva”

Carotid-femoral pulse wave velocity score, an estimator of cognitive performance in the elderly: results from the Toledo Study for Healthy Aging

Fabio A. Quiñónez Bareiro · José A. Carnicero  · Ana Alfaro Acha · Cristina Rosado Artalejo · María C. Grau Jimenez · Leocadio Rodriguez Mañas · Francisco J. García García

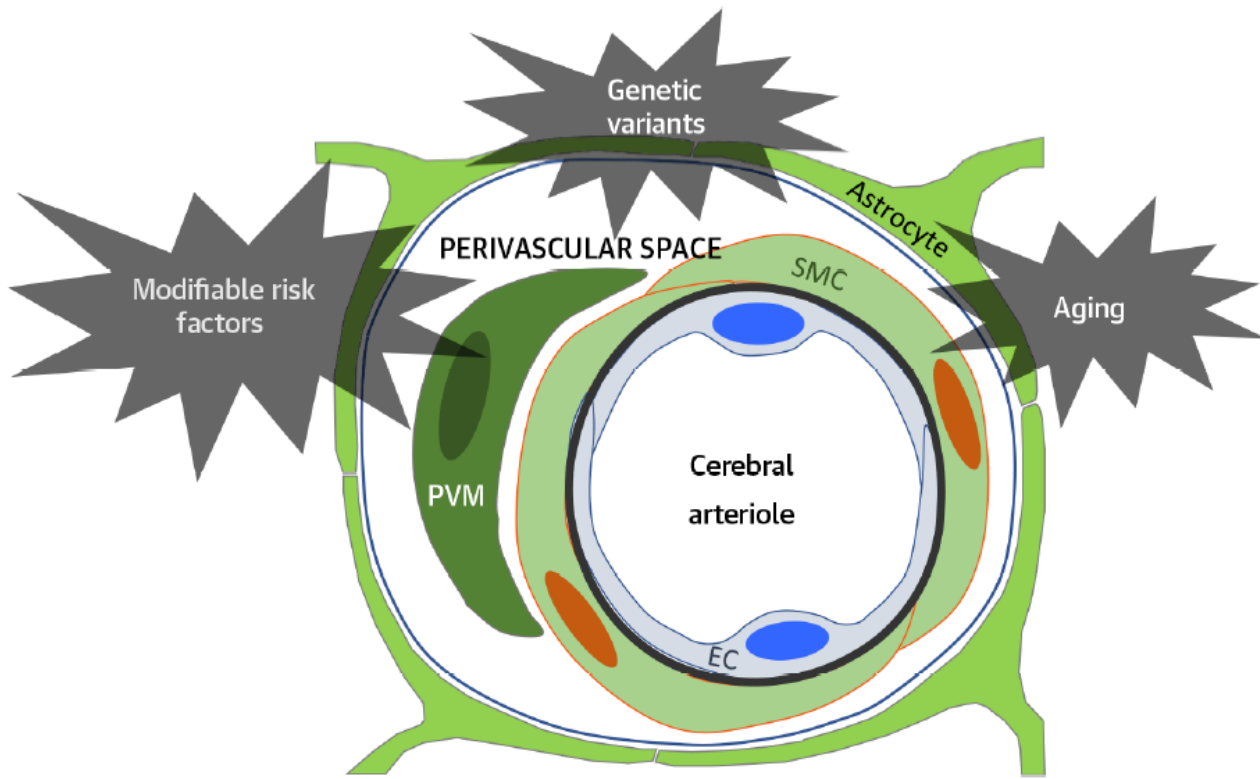
Received: 16 November 2023 / Accepted: 30 April 2024 / Published online: 22 May 2024
© The Author(s), under exclusive licence to American Aging Association 2024



How cognitive performance changes according to the ankle-brachial index score in an elderly cohort? Results from the Toledo Study of Healthy Ageing

Fabio A. Quiñónez Bareiro · José A. Carnicero  · Ana Alfaro Acha · Cristina Rosado Artalejo · María C. Grau Jimenez · Leocadio Rodriguez Mañas · Francisco J. García García

Received: 23 May 2023 / Accepted: 26 September 2023 / Published online: 23 October 2023
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Reduced CBF	BBB dysfunction	Trophic failure	Immune dysregulation	Reduced clearance
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Hypoxia	Altered brain homeostasis	Cell dysfunction	Oxidative stress cytokines	Altered proteostasis
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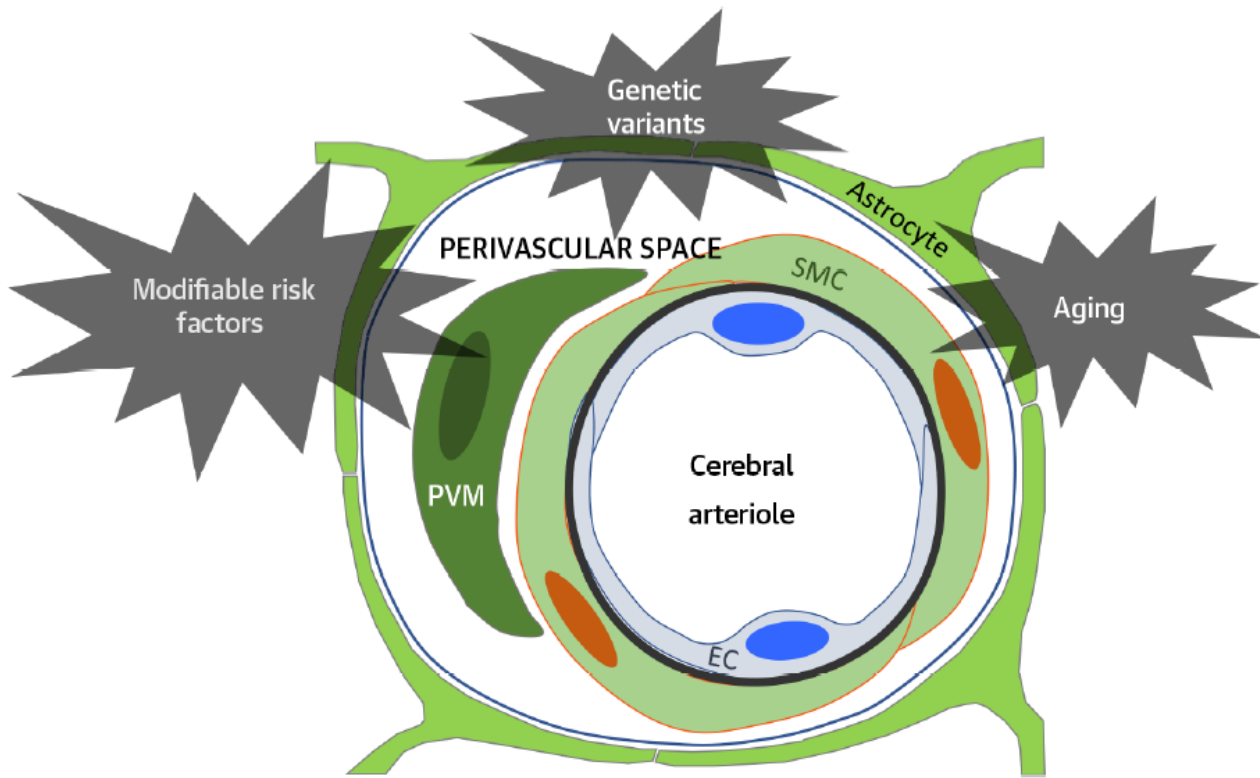
Cognitive impairment

HTA



Cardiovascular Health Status, Age, and Psychological Performance¹

Walter Spieth, Ph.D.²



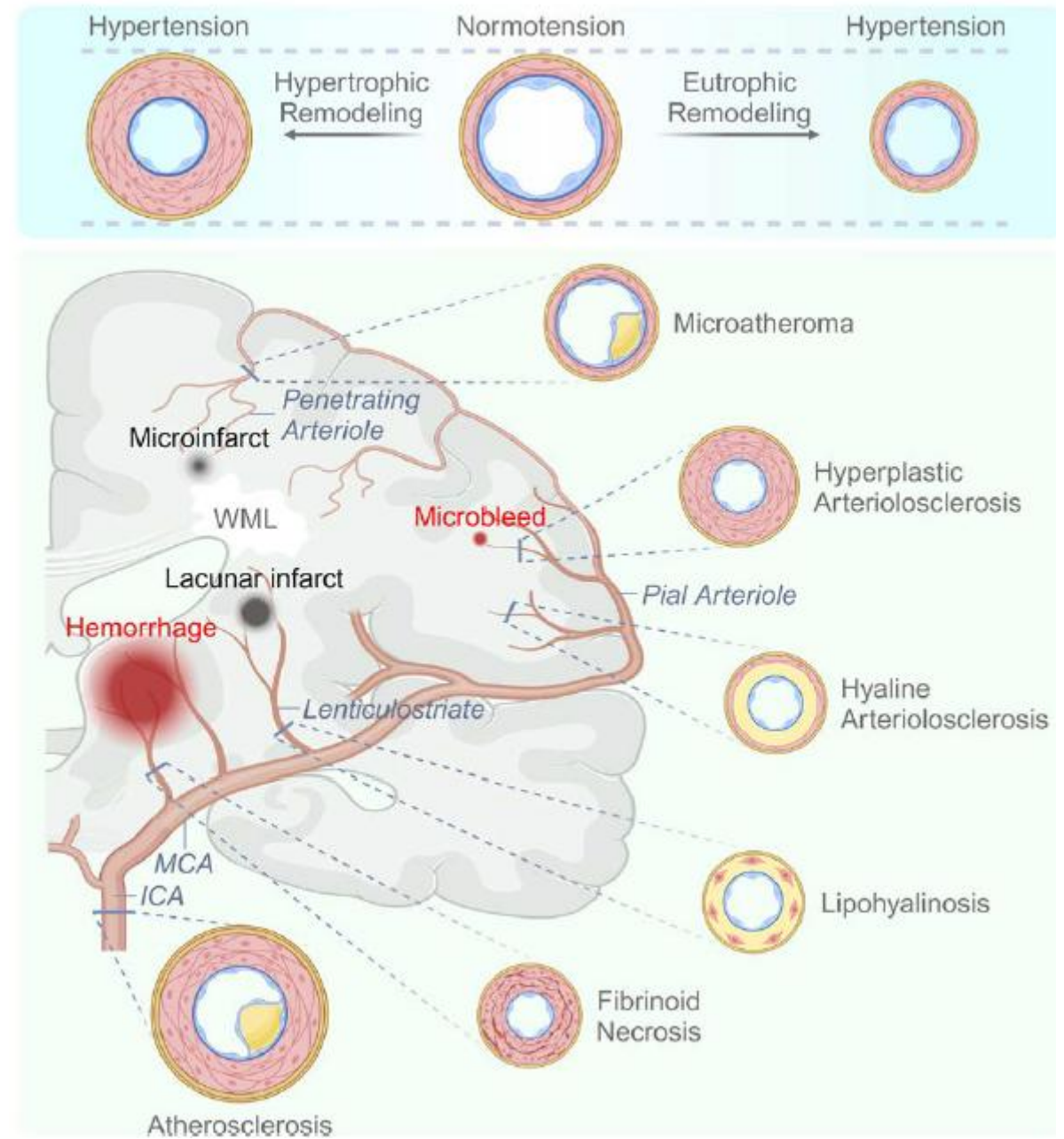
Reduced CBF BBB dysfunction Trophic failure Immune dysregulation Reduced clearance

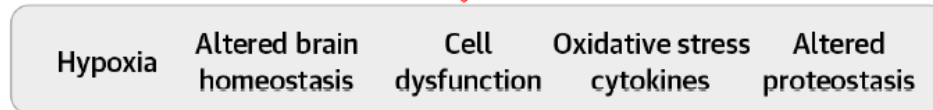
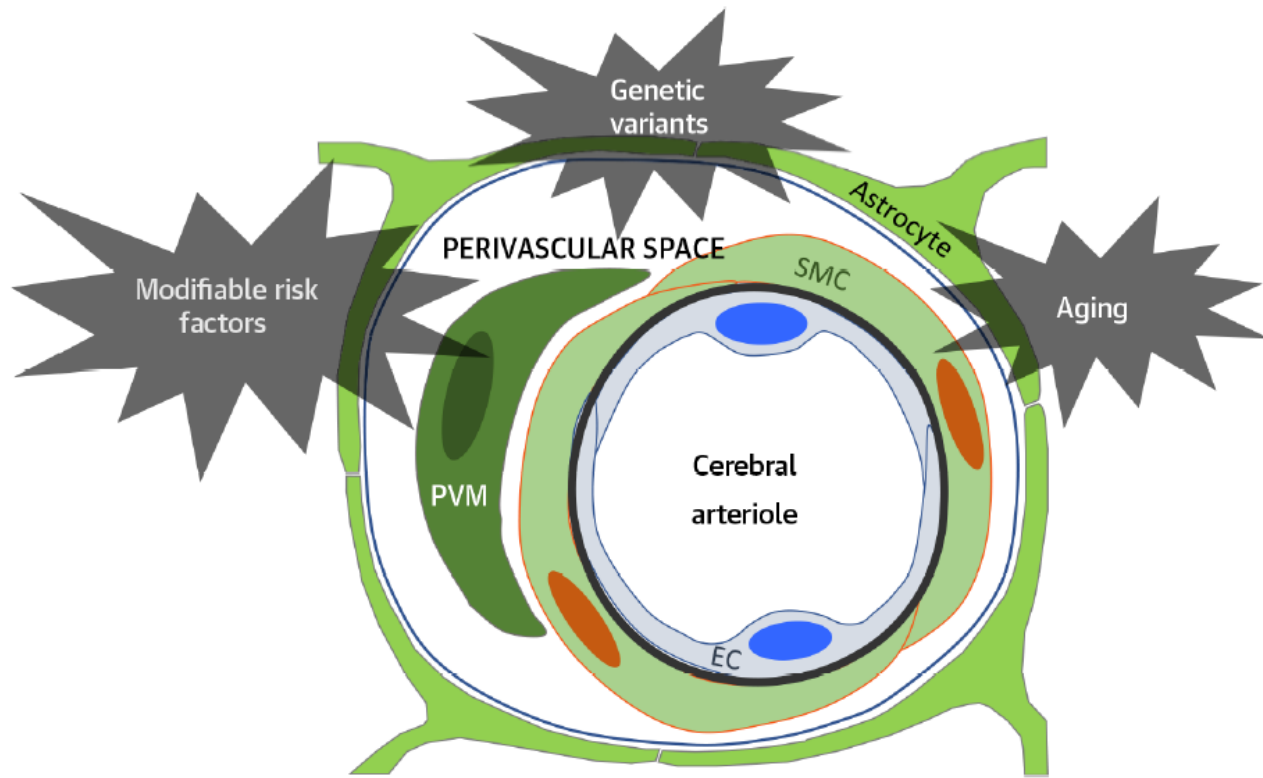


Hypoxia Altered brain homeostasis Cell dysfunction Oxidative stress cytokines Altered proteostasis

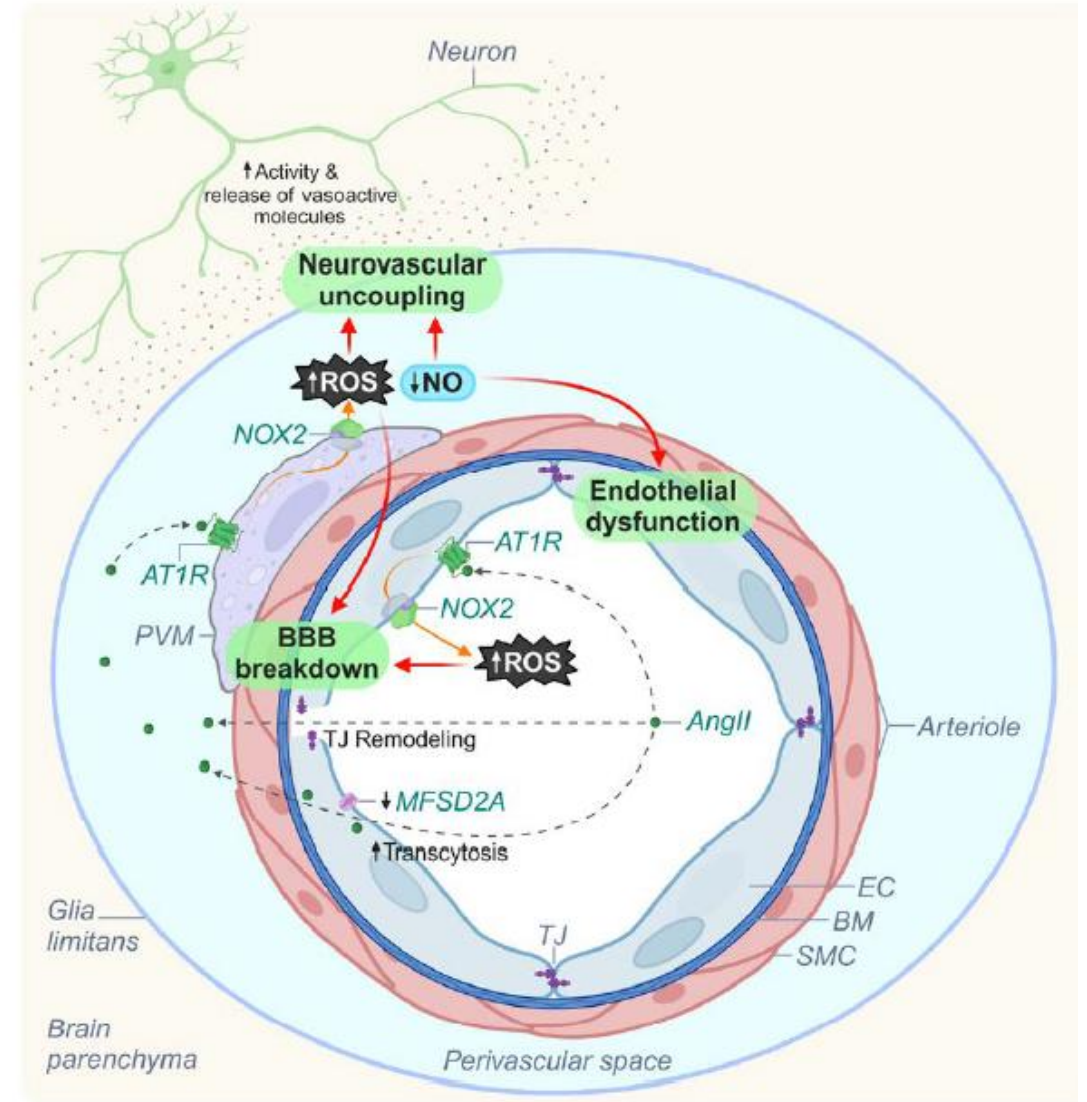


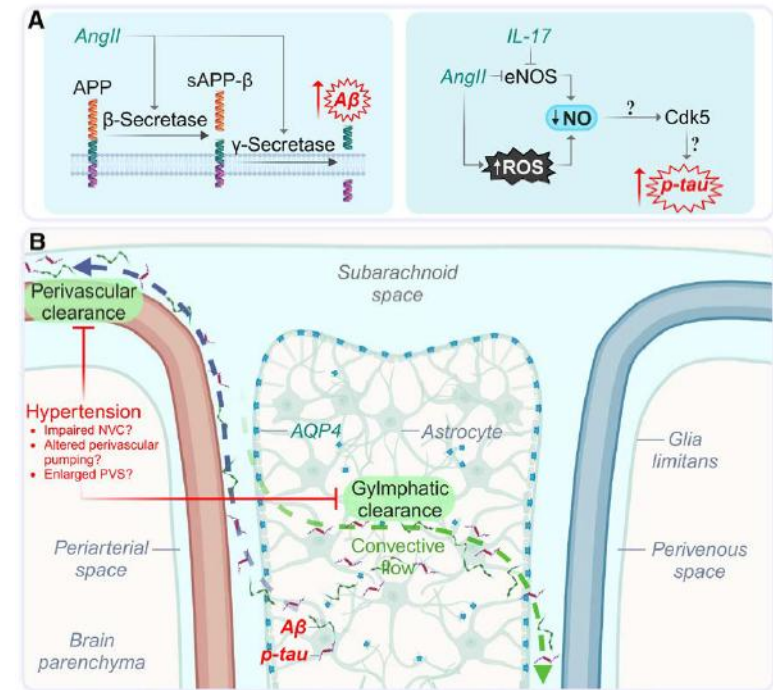
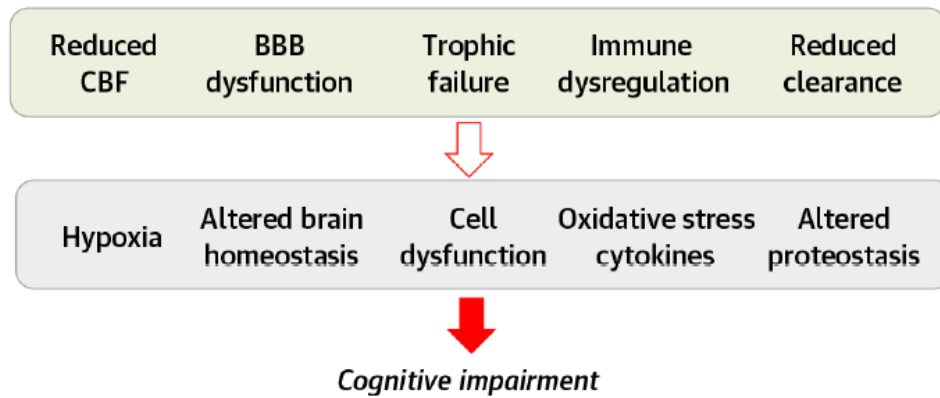
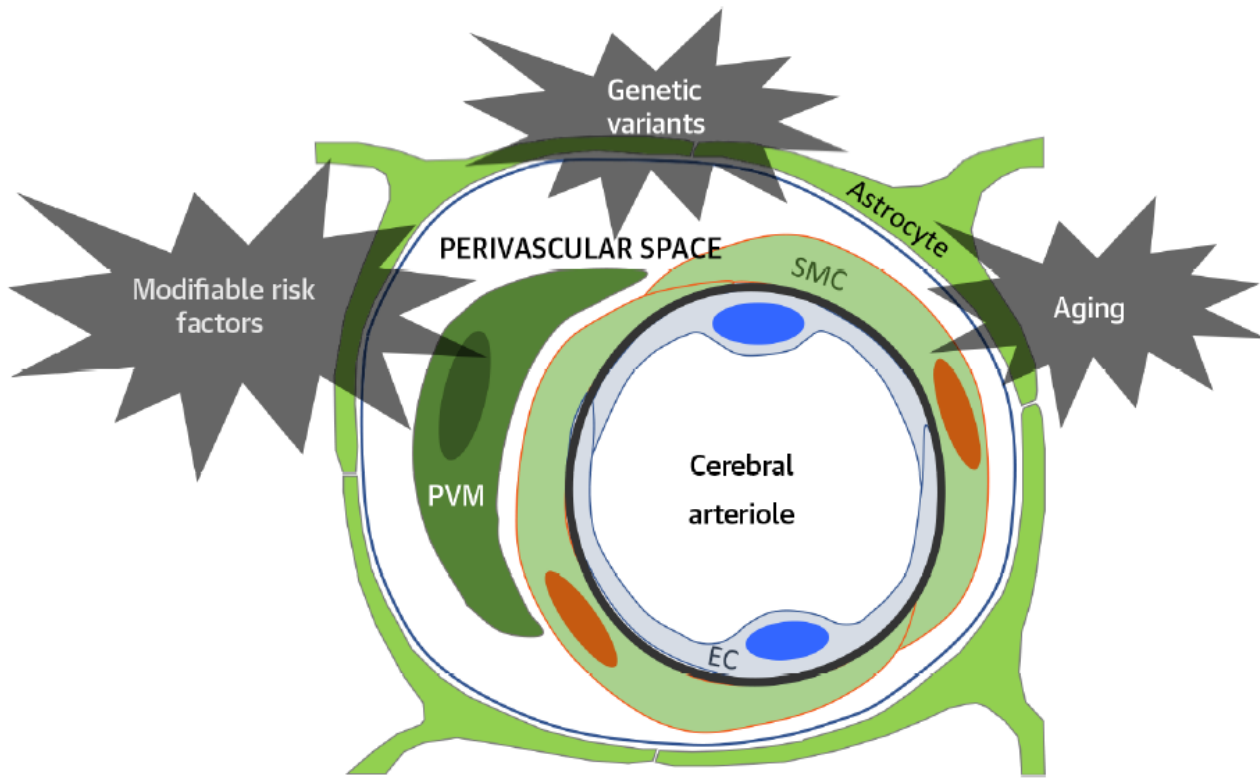
Cognitive impairment



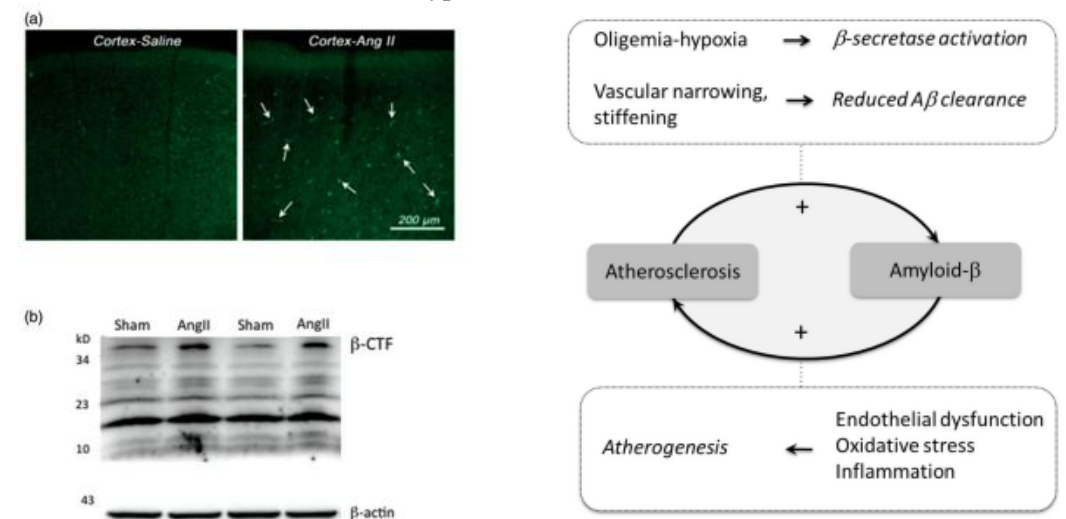


Cognitive impairment

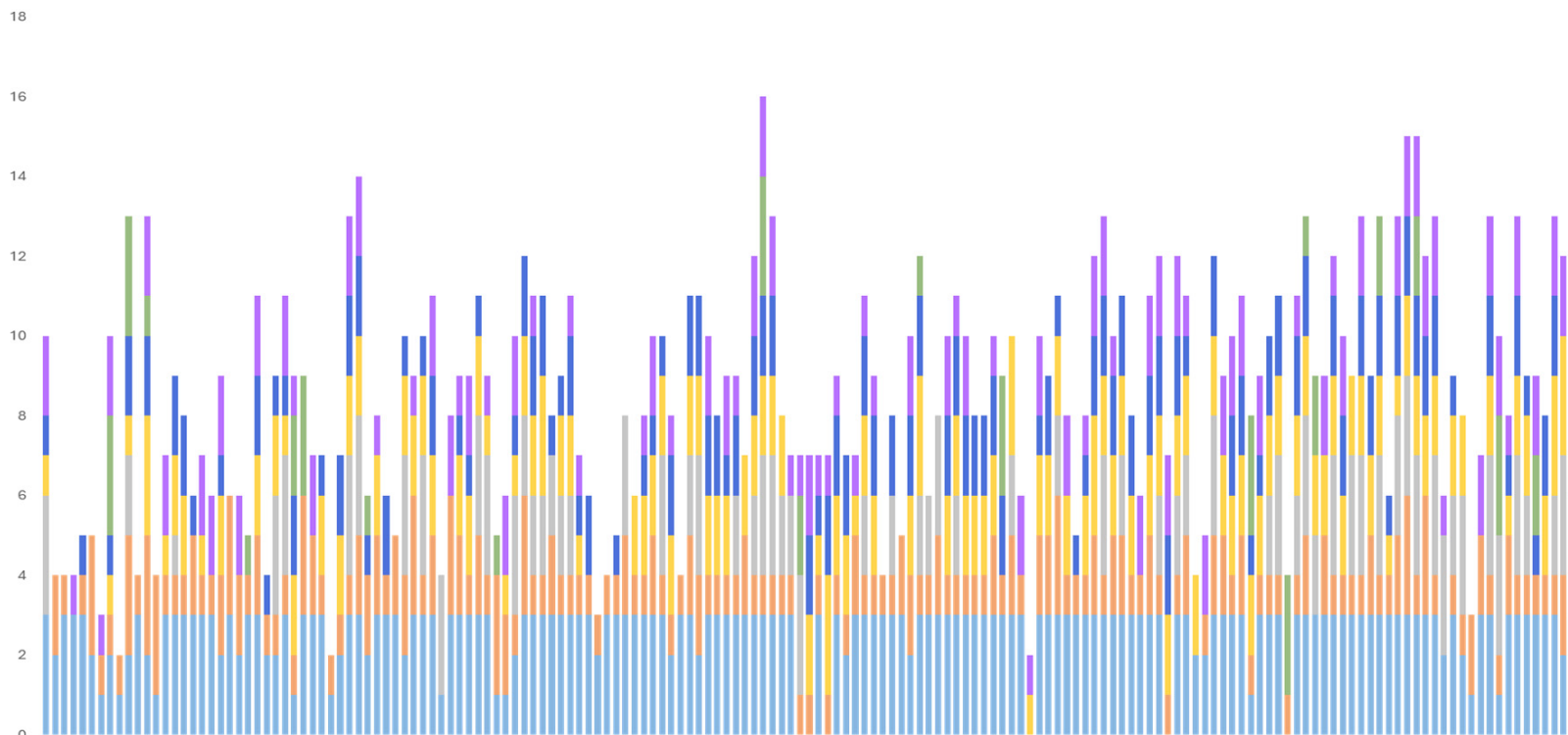
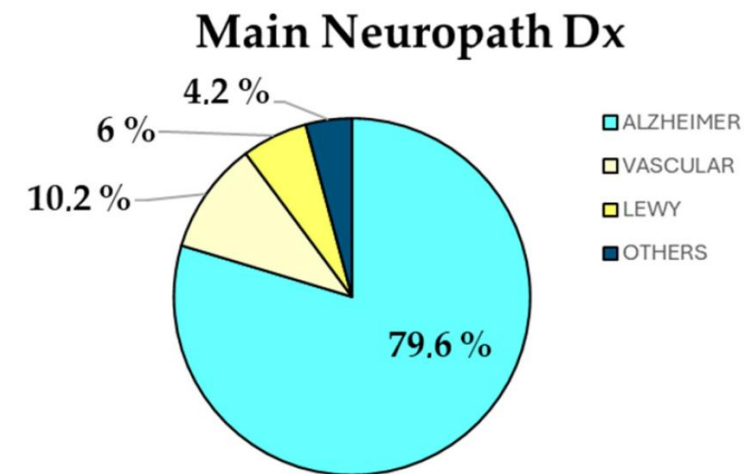




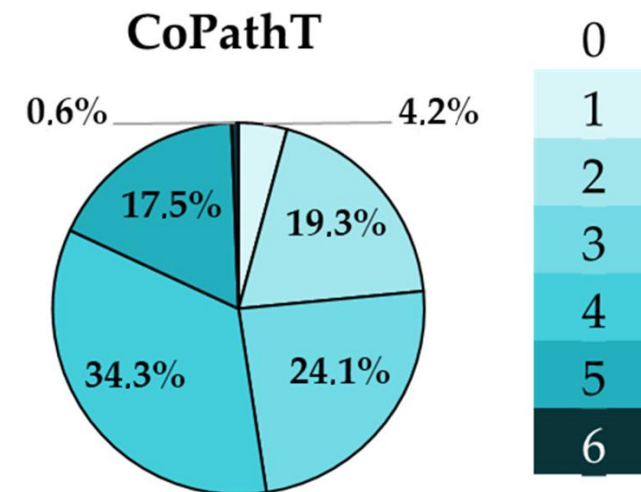
Pacholko and Iadecola. Hypertension 2024



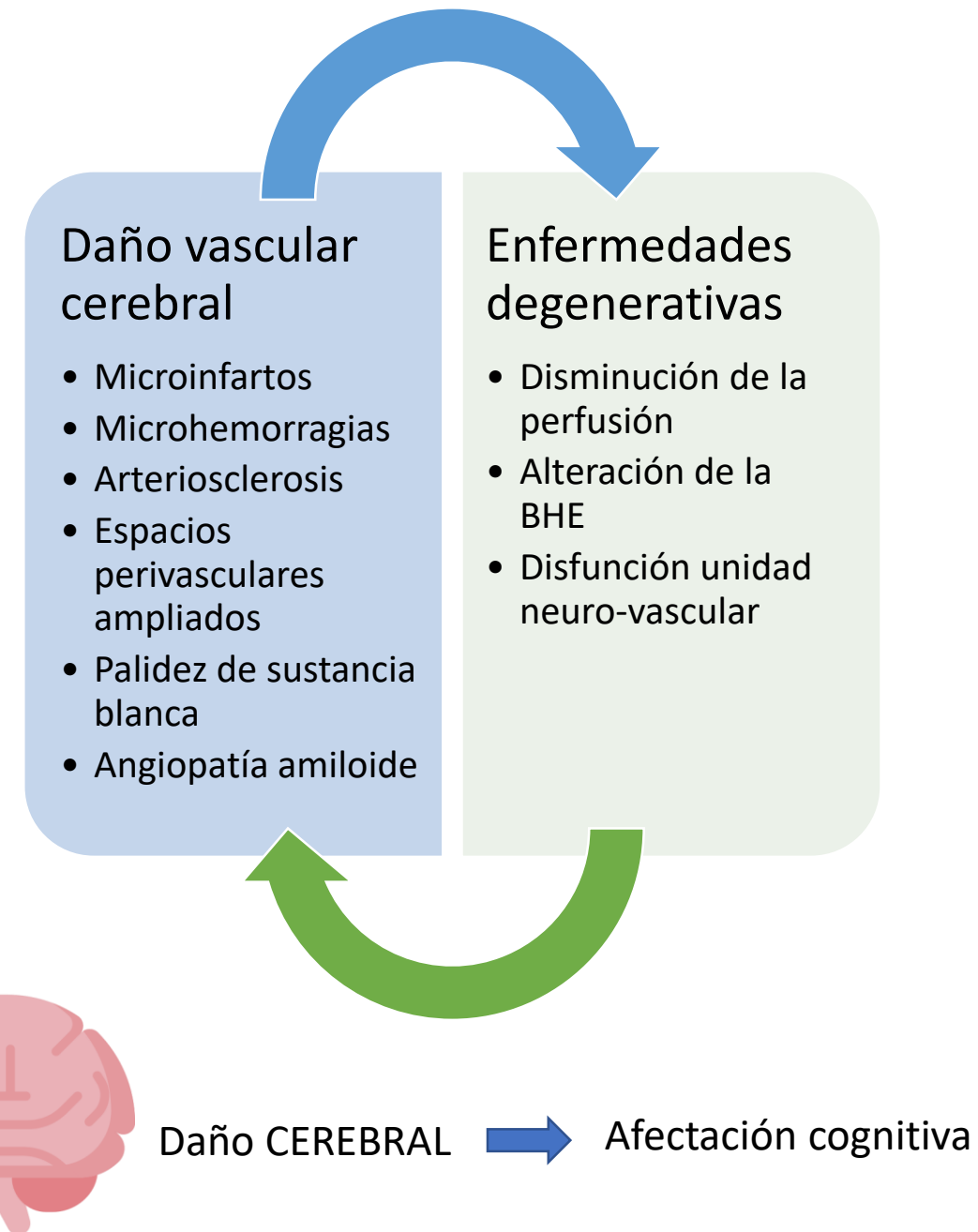
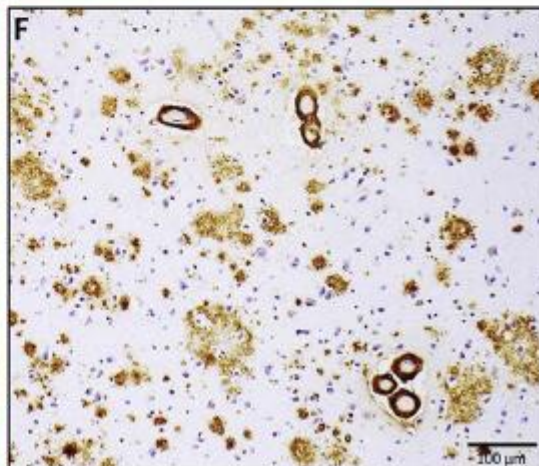
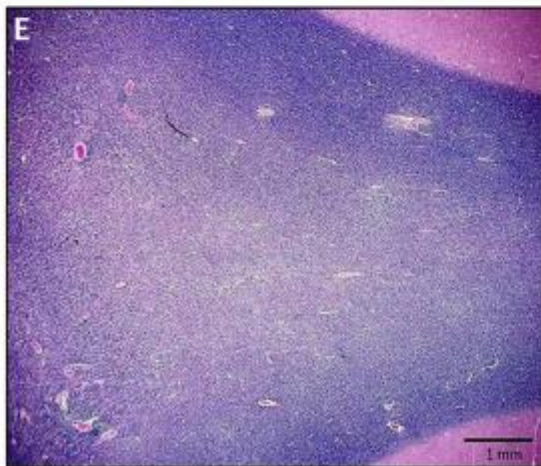
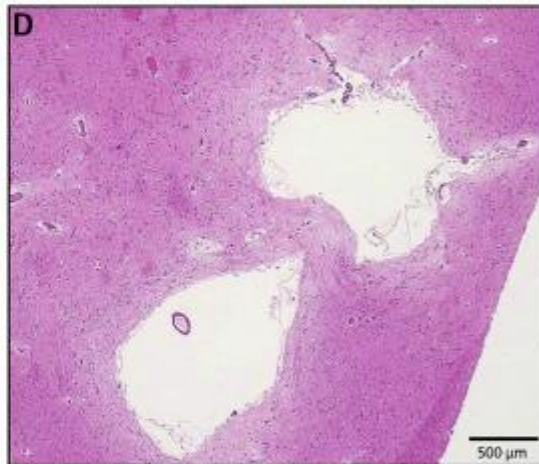
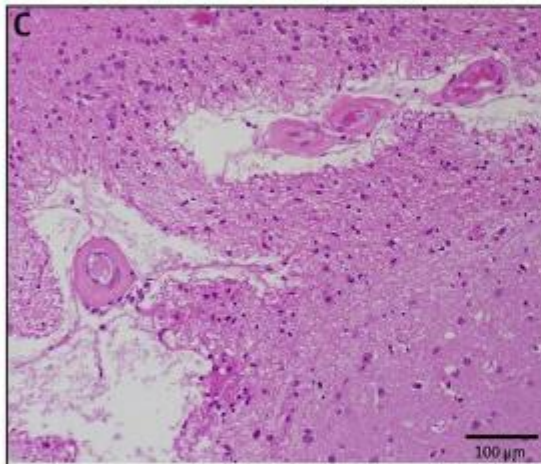
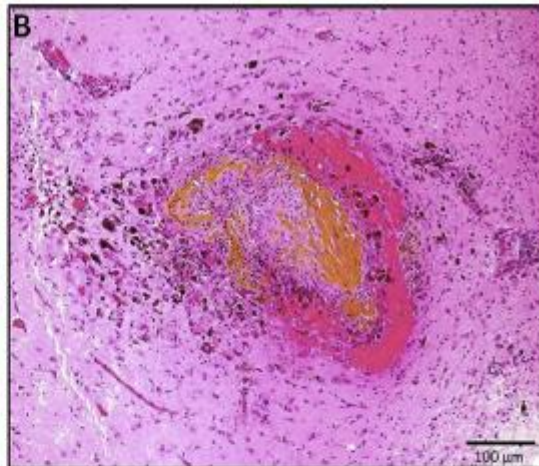
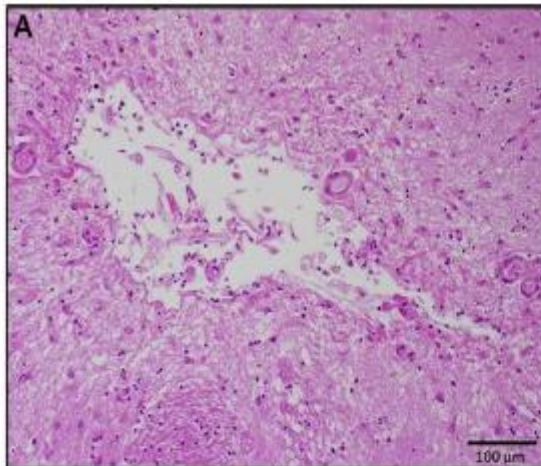
- Dx Clínico: EA 66%; 18.4% mixta, 8.2% DCL, 5.4% otras.
- La copatología es la normal y no la excepción.
- Combinaciones frecuentes entre EA, DV y DCL.
- La enfermedad cerebrovascular estuvo presente en el 38.9% de los pacientes.



Azul c: EA; Naranja: ECV; Gris: DCL; amarillo: TDP43; Azul o: esclerosis hipocampal; verde: enfermedad de granos argirófilos; púrpura: astrogliopatía tau



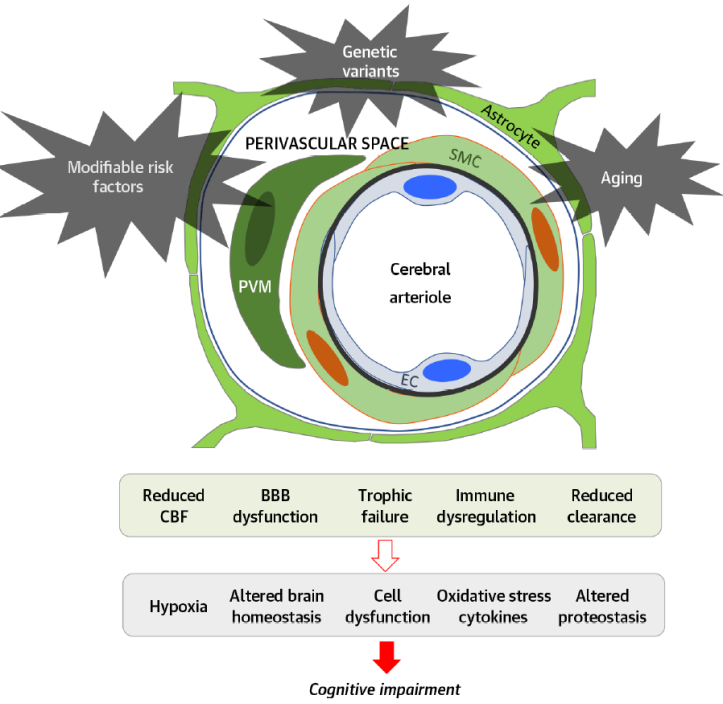
Burgueño-García I, J Clin Med. 2024



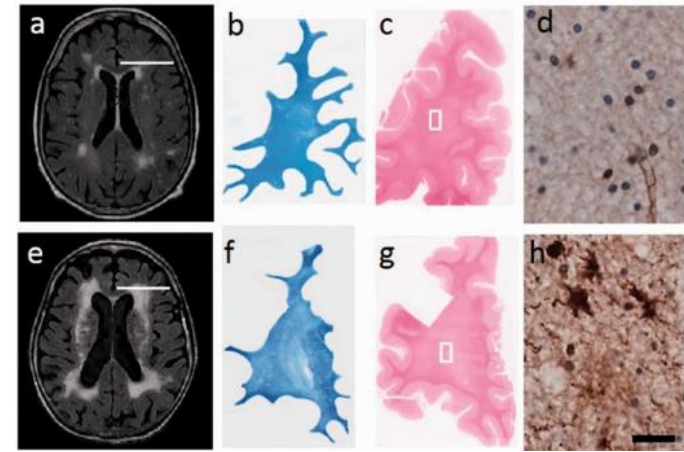
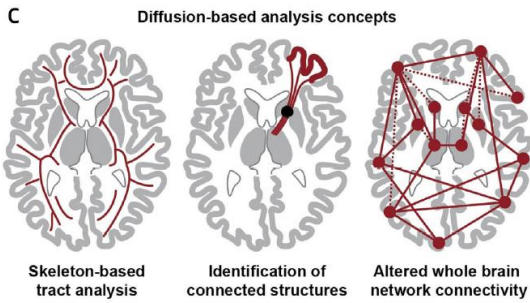
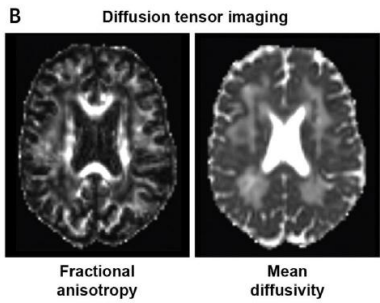
AHA/ASA SCIENTIFIC STATEMENT

The Neurovasculome: Key Roles in Brain Health and Cognitive Impairment: A Scientific Statement From the American Heart Association/American Stroke Association

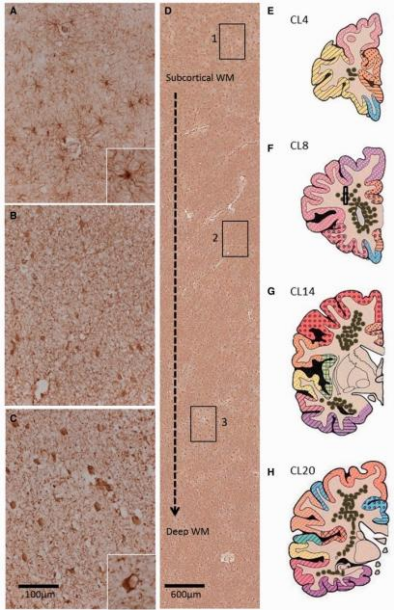
Costantino Iadecola, MD, Chair; Eric E. Smith, MD, FAHA, Vice Chair; Josef Anrather, VMD; Chenghua Gu, PhD; Anusha Mishra, PhD; Sarinay Misra, MD, FAHA; Miguel A. Perez-Pinzon, PhD, FAHA; Andy Y. Shih, PhD; Farzaneh A. Sorond, MD; Susanne J. van Veluw, PhD; Cheryl L. Wellington, PhD; on behalf of the American Heart Association Stroke Council; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular Radiology and Intervention; Council on Hypertension; and Council on Lifestyle and Cardiometabolic Health



Iadecola et al. J Am Coll Cardiol. 2019



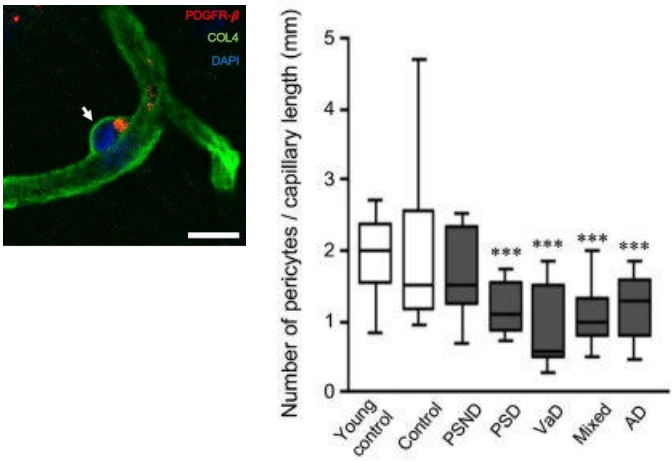
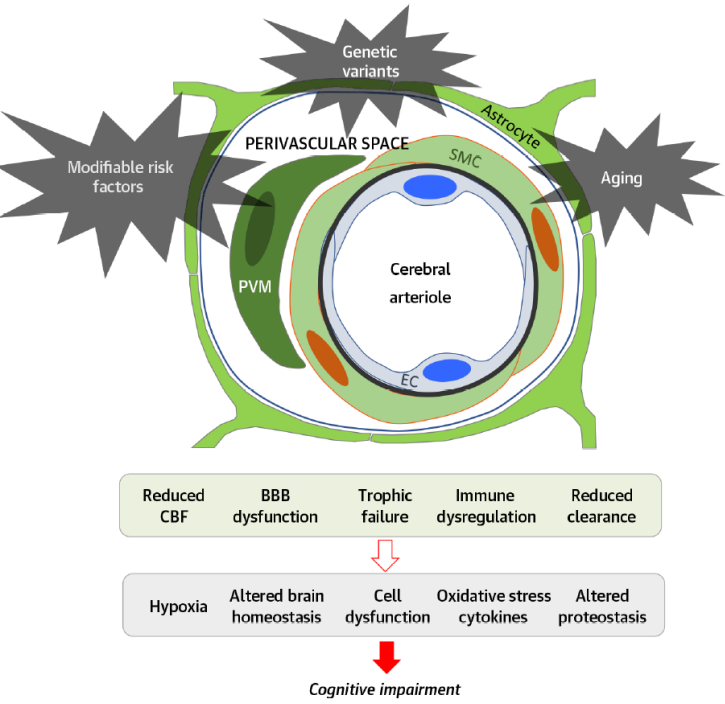
Chen A et al. Brain. 2016



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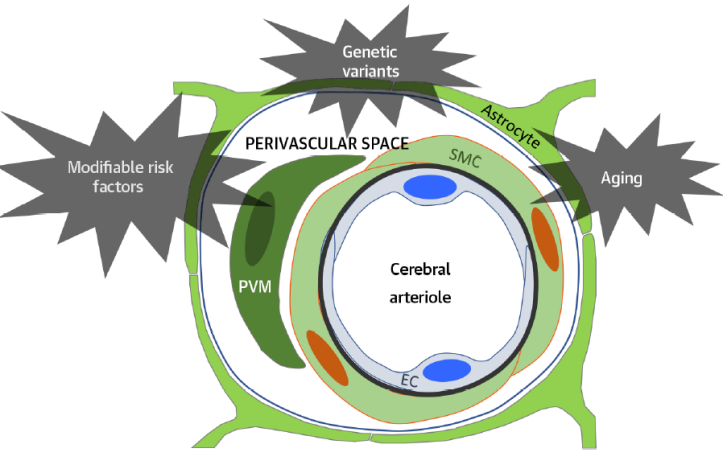
Los pericitos disminuyen en la sustancia blanca profunda en las demencias (pero no en ictus sin demencia)

Ding R et al. Brain Pathol. 2020

AHA/ASA SCIENTIFIC STATEMENT

The Neurovasculome: Key Roles in Brain Health and Cognitive Impairment: A Scientific Statement From the American Heart Association/American Stroke Association

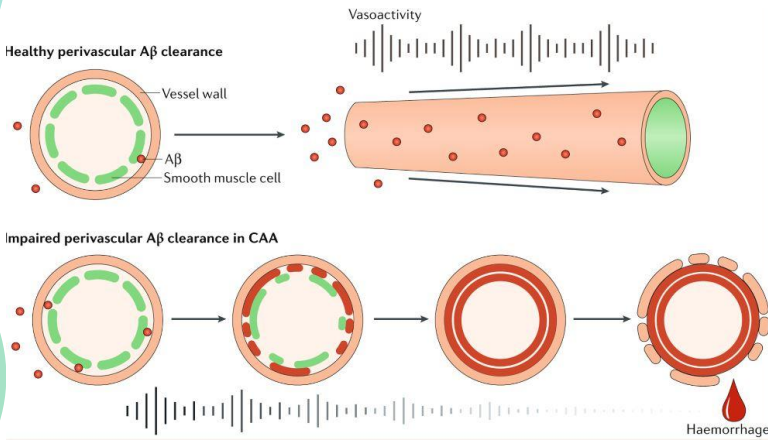
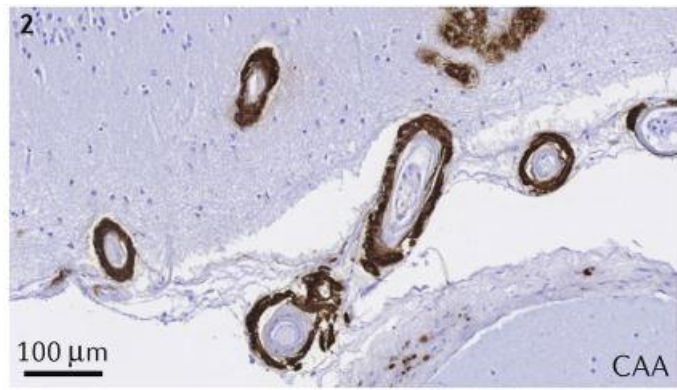
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Reduced CBF BBB dysfunction Trophic failure Immune dysregulation Reduced clearance

Hypoxia Altered brain homeostasis Cell dysfunction Oxidative stress cytokines Altered proteostasis

Cognitive impairment

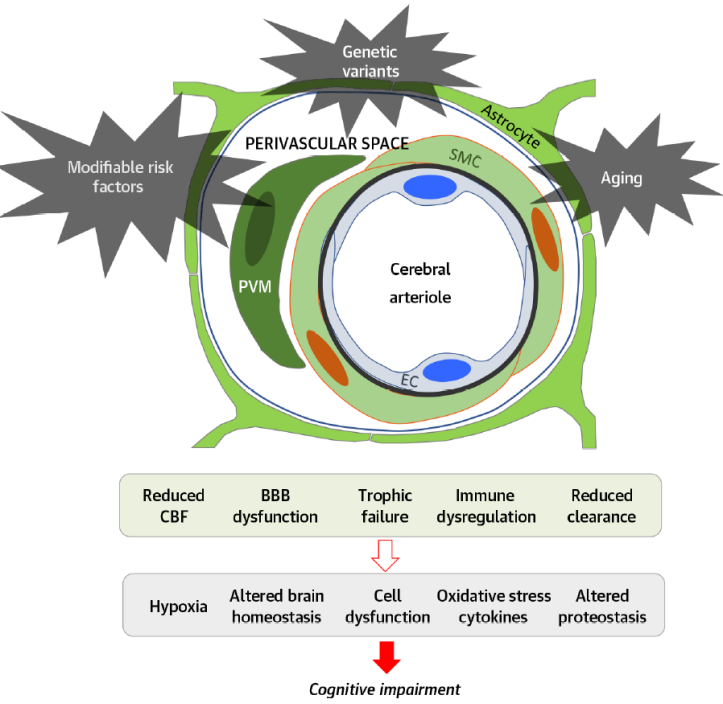


Greenberg SM, et al. Nat Rev Neurol. 2020

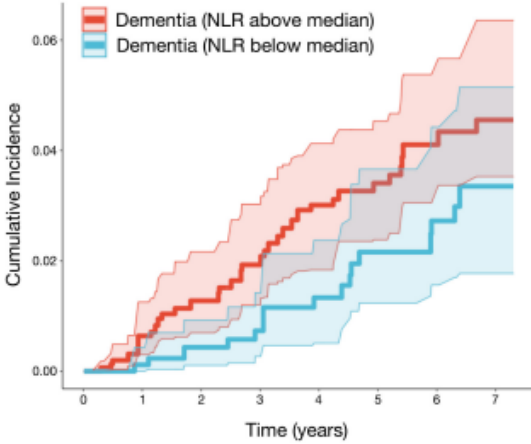
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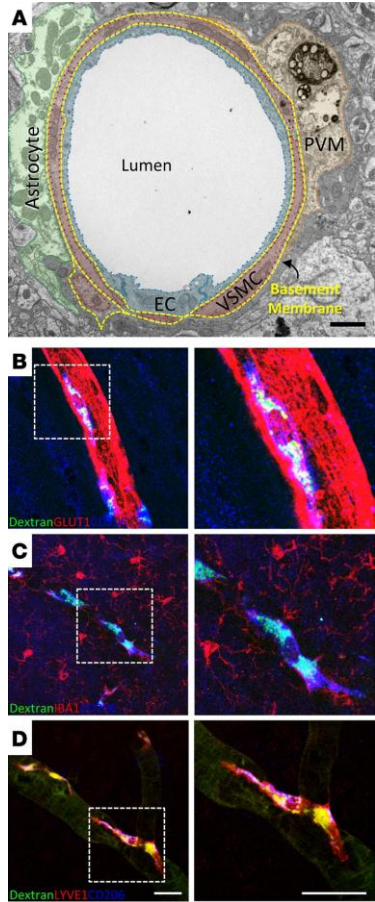
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Iadecola et al. J Am Coll Cardiol. 2019



Ramos-Cejudo J et al. Front Aging Neurosci. 2021



Faraco G et al. J Clin Invest. 2016

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Table. Selected In Vivo Human Neuroimaging and Fluid Biomarkers of Neurovasculome Dysfunction and Cognitive Decline

Pathophysiological process	Biomarker	
	Imaging	Biofluid
Astrocyte dysfunction	...	Glial fibrillary acidic protein ¹⁸²
Pericyte stress	...	Platelet-derived growth factor β ¹⁸³
Functional connectivity	Resting-state fMRI ¹⁸⁴ Task-related fMRI ¹⁸⁵	...
Low CBF	ASL MRI ¹⁸⁶ ¹⁵ Oxygen PET ¹⁸⁷	...
Altered cerebrovascular reactivity to CO ₂	Evoked TCD flow velocity ¹⁷⁸ Evoked MRI ASL or fMRI BOLD responses ¹⁸⁸	...
Vascular stiffness and pulsatility	Ankle-brachial index ¹⁸⁹ Pulse-wave velocity measurements ¹⁹⁰ Phase-contrast MRI ¹⁹¹	...
BBB permeability	MR DCE and DSC permeability ¹⁹²	CSF:serum albumin ratio ¹⁹³ Matrix metalloproteinases ¹⁹⁴
CSF bulk flow and clearance	Ultralong echo time diffusion MRI ¹⁹⁵ Phase-contrast MRI ¹⁹⁶ BOLD MRI ¹⁹⁷	...
Inflammation	TSPO PET (microglial activation) ¹⁹⁷	Biochemical markers, including C-reactive protein and interleukins ¹⁹⁸
Lipid dysmetabolism	...	Blood cholesterol ^{199,200} Blood lipidomics ¹⁹⁹
Endothelial dysfunction	Brachial flow-mediated dilation ²⁰¹	Circulating microparticles ²⁰² Various blood markers (including fibrinogen, PAI, ICAM-1, ADMA, and others) ²⁰³

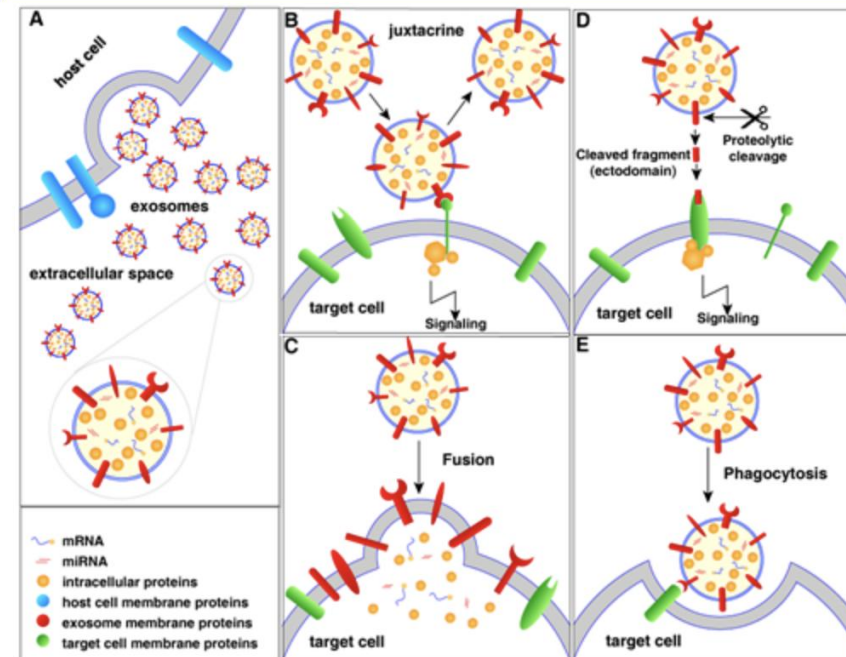
Próximos pasos

We tried to make separate
mimicry of components of
something that is actually a whole.

COMUNICACIÓN INTERCELULAR



Intercellular communication mediated by EVs:





Contents lists available at ScienceDirect

Brain Behavior and Immunity

journal homepage: www.elsevier.com/locate/brainbeh

biomedicines



Brain and immune system-derived extracellular vesicles of complement system, extracellular matrix remodeling antigen tolerance in Multiple sclerosis

Gabriel Torres Iglesias^{a,1}, Mireya Fernández-Fournier^{a,1}, Lucía Botell: Fernando Laso-García^a, Mari Carmen Gómez-de Frutos^a, Beatriz Char Inmaculada Puertas^a, Antonio Tallón Barranco^a, Blanca Fuentes^a, Ma Elisa Alonso-López^a, Susana B. Bravo^b, María Eugenia Miranda-Carús Rodrigo Barderas^d, Exuperio Díez-Tejedor^{a,2}, María Gutiérrez-Fernán Laura Otero-Ortega^{a,*,2}

Article

Similarities and Differences in Extracellular Vesicle Profiles between Ischaemic Stroke and Myocardial Infarction

Laura Otero-Ortega^{1,†}, Elisa Alonso-López^{1,†}, María Pérez-Mato^{1,†}, Fernando Laso-García^{1,†}, Mari Carmen Gómez-de Frutos¹, Luke Diekhofst¹, María Laura García-Bermejo², Elisa Conde-Moreno², Blanca Fuentes¹, María Alonso de Leciñana¹, Eduardo Armada³, Lorena Buiza-Palomino⁴, Exuperio Díez-Tejedor^{1,†} and María Gutiérrez-Fernández^{1,*,†}



biomedicines



Article

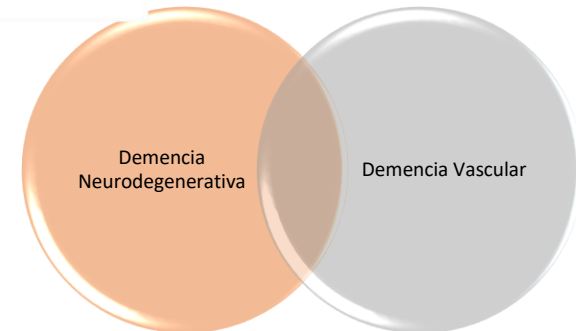
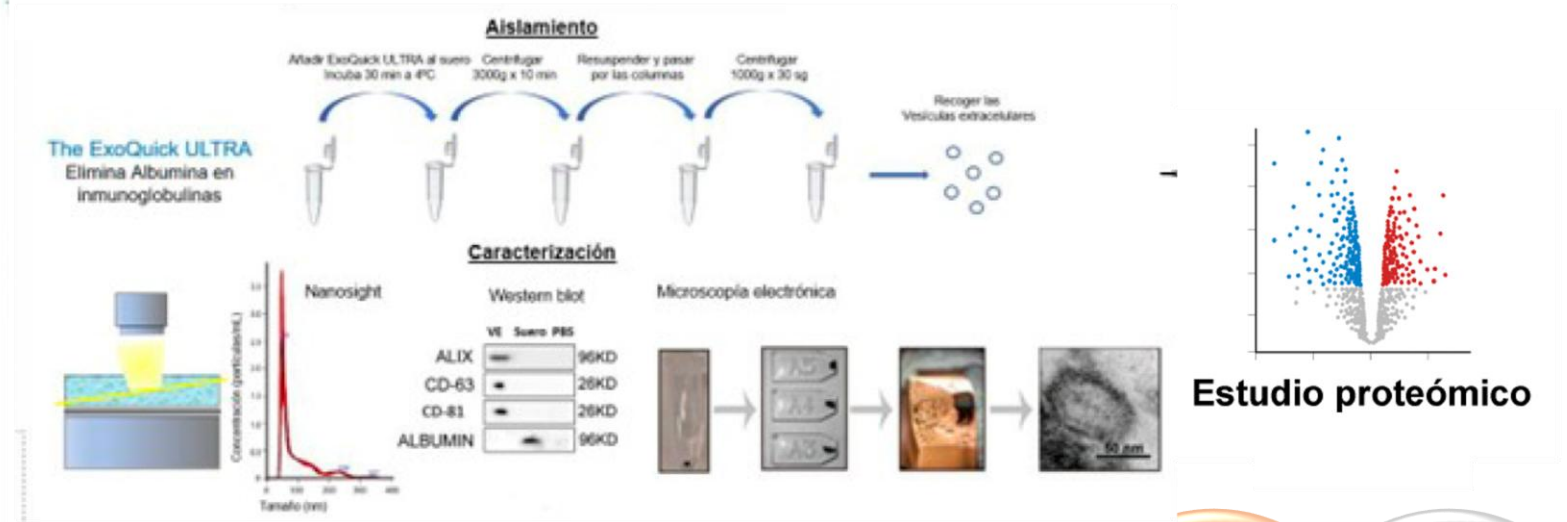
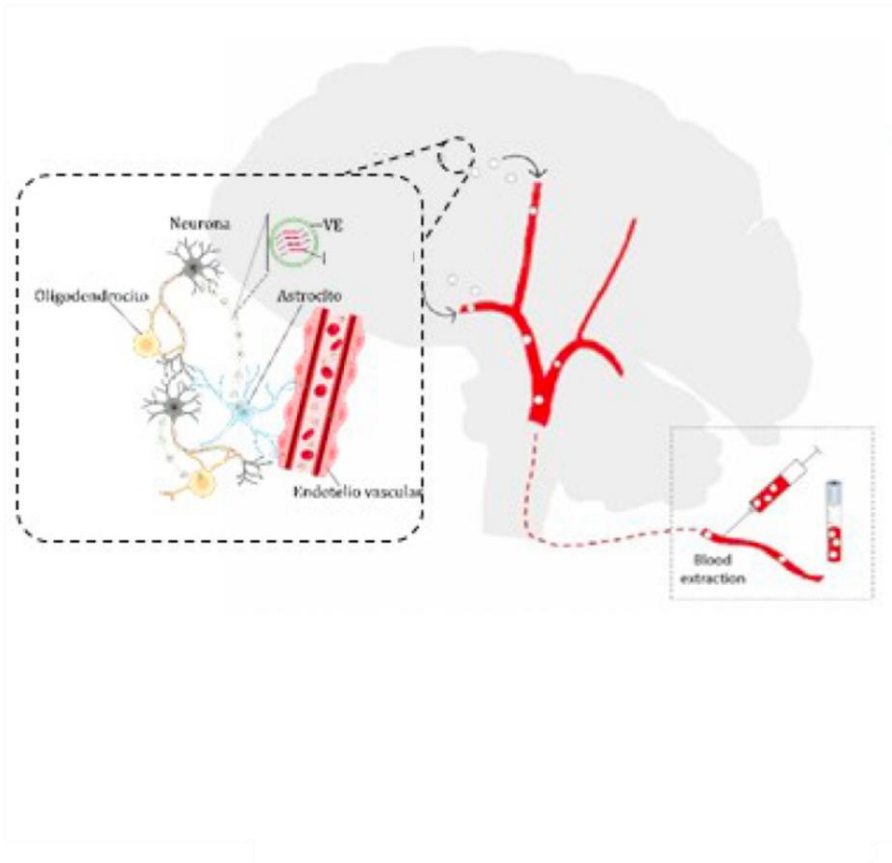
Circulating Extracellular Vesicle Proteins and MicroRNA Profiles in Subcortical and Cortical-Subcortical Ischaemic Stroke

Laura Otero-Ortega^{1,†}, Elisa Alonso-López^{1,†}, María Pérez-Mato^{1,†}, Fernando Laso-García¹, Mari Carmen Gómez-de Frutos¹, Luke Diekhofst¹, María Laura García-Bermejo², Elisa Conde-Moreno², Blanca Fuentes¹, María Alonso de Leciñana¹, Susana B. Bravo³, Exuperio Díez-Tejedor^{1,†} and María Gutiérrez-Fernández^{1,*,†}

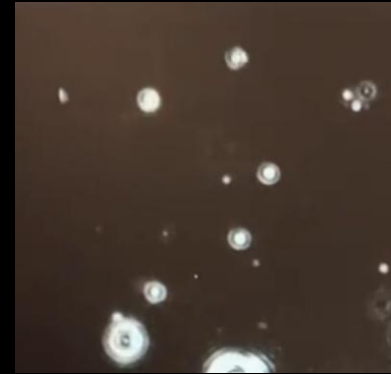
uertas^c, Juan Angel Fresno-Vara^c, Blanca Fuentes^a,
z-Tejedor¹, María Gutiérrez-Fernández^{1,*,†} and
De Leciñana^{1,*,†}

ces and Cerebrovascular Research Laboratory, Department of Neurology and Stroke
ind Cerebrovascular Disease Group, Neuroscience Area La Paz Hospital Institute for
liPAZ (La Paz University Hospital—Universidad Autónoma de Madrid), Madrid, Spain,
uroscience, Universidad Autónoma de Madrid—Instituto Cajal, Madrid, Spain,
ma de Madrid and IdiPAZ Health Research Institute, La Paz University Hospital, Madrid,
nit, Health Research Institute of Santiago de Compostela (IDIS), Santiago de

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*“Lo que parecen estrellas,
son Galaxias”*

Telescopio espacial James Webb de la
NASA