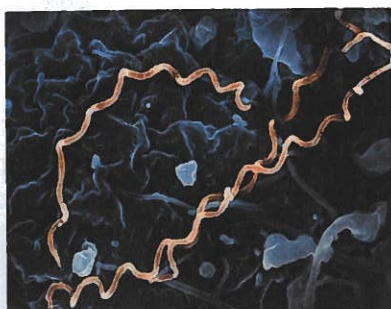


BRAIN



Cover image: Colorized electron micrograph of *Treponema pallidum*, the bacteria that cause syphilis. Several spiral-shaped bacteria have been highlighted in gold. Credit: NIAID See related August 29, 2023 NIAID Now blog, "NIAID-Supported Research is Advancing the Response to Surging Syphilis Rates" at www.niaid.nih.gov/news-events/niaidsyphilis-research. Licensed under the Creative Commons Attribution 2.0 Generic license. *Brain*. 2025; 148(12):4215–4233.

Contents

Editorial

Apathy in older age: why it might signal neurodegeneration

M. Husain
4143

Essays

What is a neurological disease? Definition is not as simple as it might seem

S. Shorvon
4145

Charcot redux

A.J. Lees
4148

Scientific Commentaries

Beyond clinical labels: a molecular-structural framework for multiple sclerosis subtyping

T. Brummer and V. Fleischer
4155

White matter changes in Alzheimer's disease: contributor, consequence or co-pathology?

J. Neitzel
4158

Thalamic highways as a bridge to neuromodulation

D. E. Burdette, B. Sarvi Zargar and P. Ferrari
4161

Better annotations, better outcomes: extending the suppression hypothesis to seizure times

A. R. Pattanaik
4164

Opinions

Academia, industry and the slow adoption of new treatments

P. Klein, A. Pong, M. Koepp, W. Löscher, J. W. Sander and E. Faught
4166



Rethinking corticosteroid therapy in autoimmune neurology

C. S. C. Teoh, S. G. Dubey and A. E. Handel

4170

The postdoc paradox: a career without a path

J. Pansieri, S. Figiel, D. Menassa, V. A. G. Ricigliano, M. Seferoglu, S. Borrelli, N. Szejko, S. Samadzadeh, V. Boldrini, L. Zarco, E. P. Correa-Díaz, V. Pozzilli, S. Marenga, E. Carnero Contentti, E. R. Koc, G. Dalla Costa, A. Casallas-Vanegas, C. Bakirtzis, S. Gluscevic, A. Tunç and E. Gomez Figueroa

4175

Review Articles

The potential of laminar functional MRI in refining the understanding of epilepsy in humans

F. Aitken, J. S. Winston, J. O'Muircheartaigh and D. W. Carmichael

4180

Principal axis of primate basal ganglia in processing cognitive flexibility and habitual stability

H. F. Kim

4198

Is multiple sclerosis-related depression different from depression in general? The data for and against

A. Feinstein, A. Bar-Or, R. H. B. Benedict, M. Filippi, D. E. Freedman, A. Kever, C. Meza and M. A. Rocca

4210

Neurosyphilis

C. M. Marra

4222

Updates

Iron on trial: recasting the role of iron in neurodegeneration

S. Ayton, C. Moreau, D. Devos and A. I. Bush

4241

Covert consciousness: what's in a name?

C. Aubinet, J. Claassen, B. L. Edlow, D. Fischer, O. Gosseries, C. Koch, D. Kondziella, M. Massimini and M. J. Young

4248

Report

A large cohort study of prenatal exome sequencing redefines diagnosis in fetal corpus callosum anomalies

D. Héron, A. Gerasimenko, L. Frugère, J. Ducourneau, C. Rossi, C. Nava, J.-M. de Sainte-Agathe, C. Mignot, D. Lehalle, S. Grotto, L. El-Khattabi, T. Nguyen, C. Garel, E. Blondiaux, M. Milh, B. Desnoux, N. Girard, V. des Portes, L. Guibaud, I. Sabatier, O. Patat, S. Julia, A. Benachi, A. Vivanti, O. Picone, A. Guet, M. Nizon, M. Vincent, S. Conrad, C. Le Vaillant, T. Billelte de Villemeur, S. Moutton, V. Tsatsaris, L. Guibaud, J.-M. Jouannic, S. Valence, B. Keren and S. Heide

4253

Original Articles

SLC35A2 loss-of-function variants affect glycomic signatures, neuronal fate and network dynamics

D. Lai, P. Sosicka, D. J. Williams, M. E. Bowyer, A. K. Ressler, S. E. Kohrt, S. J. Muron, P. B. Crino, H. H. Freeze, M. J. Boland and E. L. Heinzen

4259

Collapse of interictal suppressive networks permits seizure spread

G. S. Makhoul, D. J. Doss, G. W. Johnson, C. P. Withers, A. C. Cavender, B. Hidalgo Monroy Lerma, A. Reda, C. E. Bibro, E. Liao, H. Kang, B. M. Dawant, S. B. Reddy, A. N. Crudele, C. Constantinidis, S. Williams Roberson, S. K. Bick, V. L. Morgan and D. J. Englot

4275

Comparative effectiveness of anti-seizure medications in emulated trials using medical informatics

K. Xie, J. Korzun, D. J. Zhou, E. Chang, N. J. Ghosn, S. Lavelle, A. Oganisian, E. K. Acton, M. A. Gelfand, D. Roth, B. Litt and C. A. Ellis

4288

Endosomal 2Cl⁻/H⁺ exchangers regulate neuronal excitability by tuning K_v7/KCNQ channel density

G. Qi, A. Diaz-Castillo, C. Aretzweiler, L. Steinmetz, S. Bungert-Plümke, F. Müller, D. Feldmeyer and R. E. Guzman

4299

Electrophysiological connections linking medial pulvinar, anterior nuclei of the thalamus and the hippocampus

M. Togo, D. Lyu, W. Huang, S. Pantis, R. Fisher, R. Matsumoto, V. Buch and J. Parvizi

4315

POU3F2 regulates canonical Wnt signalling via SOX13 and ADNP to expand the neural progenitor population

C. R. Benoit, L. B. Sattler, A. J. Aylward, O. Pembbridge, B. Kim, C. R. Muratore, M. Liao, A. He, N. Ashour, S. B. Fancher, A. M. Lish, R. V. Pearse, J. D. Buxbaum and T. L. Young-Pearse

4325

Mild behavioural impairment-apathy and core Alzheimer's disease cerebrospinal fluid biomarkers

D. Vellone, R. Leon, Z. Goodarzi, N. D. Forkert, E. E. Smith and Z. Ismail

4345

Cortical tau deposition promotes atrophy in connected white matter regions in Alzheimer's disease

J. Pescoller, A. Dewenter, A. Dehsarvi, A. Steward, L. Frontzkowski, Z. Zhu, S. N. Roemer-Cassiano, C. Palleis, F. Hirsch, F. Wagner, H. de Bruin, B. S. Rauchmann, R. Perneczky, J. Gnörich, M. Malpetti, R. Ossenkoppele, M. Schöll, J. Levin, G. U. Höglinger, M. Brendel and N. Franzmeier

4359

Early proteasome downregulation and dysfunction drive proteostasis failure in Alzheimer's disease

S. Jiang, M. Srikanth, R. Serpe, S. Yavari, P. Gaur, G. A. Collins, R. Soni, V. Menon and N. Myeku

4372

CSF proteomic profiles related to cognitive decline in MCI A+ depend on tau levels

E. M. Vromen, D. M. de Leeuw, A. C. van Harten, C. E. Teunissen, W. M. van der Flier, P. J. Visser and Alzheimer's Disease Neuroimaging Initiative and B. M. Tijms

4389

CRISPR editing of miR-33 restores ApoE lipidation and amyloid- β metabolism in ApoE4 sporadic Alzheimer's disease

B. Kim, M. Yuk, M. Park, H. Ryu, J. Park, H. Yu, S. Park, J. T. Hong, K.-H. Lim, S.-B. Han, N. Song and H. Park

4400

Compensatory roles of STT3A and ALG5 in glucose metabolism of aged macaque hippocampus

G.-H. Zhu, R. He, Z.-Y. Yang, T.-T. Wang, S.-C. Yang, Y.-X. Jiang, J. Li, Y.-H. Zhang, F.-X. Zhao, Y. Deng, T.-T. Pan, X.-D. Liu, B.-C. Shan, X.-Q. Zhu, S. H. Bossmann, X.-H. Pan and T.-H. Wang

4416

Disease spectrum and long-term prognosis of patients with BAG3-associated neuromuscular diseases in Europe

G. Fernández-Eulate, C. Gitiaux, S. Thiele, H. Jungbluth, A. Potulska-Chromik, C. Marini-Bettolo, J. B. Davion, G. Moris, E. Gallardo, M. Olivé, C. P. de Fuenmayor-Fernández de la Hoz, F. Audic, A. Isapof, M. C. Walter, C. Angelini, E. Bertini, U. Schara-Schmidt, K. G. Claeys, M. F. Dohrn, M. Dembele, F. Fer, G. Brochier, T. Evangelista, A. Kostera-Pruszczyk, S. Attarian, V. Straub, C. Domínguez-González, J. Vissing, P. Richard, C. Metay, D. Khraiche, K. Wahbi and T. Stojkovic

4435

Plasma periaxin is a biomarker of peripheral nerve demyelination

R. Bellanti, R. Y. S. Keh, S. Keddie, M. K. L. Chou, M. Misheva, D. Smyth, G. Baskozos, K. Moodley, M. S. Hart, A. J. Davies, M. M. Reilly, S. Rinaldi and M. P. Lunn

4448

Mutual reinforcement of lymphotoxin-driven myositis and impaired autophagy in murine muscle

J. Bremer, J. Nagel, J. Zschüntzsch, K. K. Zajt, T. Palaz, T. Blank, A. İkis, L. A. Fischer, A. S. M. Sensmeyer, L. Wiechers, J. J. Reichelt, K. P. Hofmann, M. J. Wolf, C. Leuchtenberger, P. Tripathi, C. Einer, H. Zischka, U. Rothermel, A.-L. Eck, R. R. Reimann, V. Kana, E. Rushing, A. Aguzzi, M. Prinz, D. Liebetanz, F. Odoardi, C.-C. Kuo, J. Weis, F. Kraft, J. Schmidt and M. Heikenwälder

4461

TIA1-mediated stress granules promote neurodegeneration by sequestering HSP70 mRNA in C9orf72 mice

Y. Wei, D. Li, R. Yang, Y. Liu, X. Luo, W. Zhao, H. Yang, Z. Chen, C. Shen, Y. Wang and Z. Huang

4482

Exon skipping peptide-conjugated morpholinos downregulate dynamin 2 to rescue centronuclear myopathy

F. Moschovaki-Filippidou, J. de Carvalho Neves, N. Diedhiou, Y. Jad, J. Böhm, M. J. A. Wood, M. A. Varela and J. Laporte

4495

Cholinergic patterns correlate with dopamine medication ON freezing of gait in Parkinson's disease

V. S. Hvingelby, M. H. Terkelsen, E. L. Johnsen, M. Møller, E. H. Danielsen, T. Henriksen, A. N. Glud, Y. F. Tai, A. S. Møller Andersen, A.-L. Knudsen, K. Meier, J. Horsager, N. Okkels, J. C. H. Sørensen, P. Borghammer, E. Moro and N. Pavese

4508

The influence of the glymphatic system on α -synuclein propagation: the role of aquaporin-4

D. M. Lopes, S. K. Llewellyn, S. E. Bury, J. Wang, J. A. Wells, M. E. Gegg, G. Verona, M. F. Lythgoe and I. F. Harrison

4519

Intra-putaminal muscarinic receptor agonist infusion induces a dystonic phenotype in non-human primates

B. Ribot, E. Courtin, M. Deffains, J. Aupy, S. Dovero, N. Biendon, T. H. Nguyen, H. Orignac, P. Burbaud and D. Guehl

4532

Boosting hemianopia recovery: the power of interareal cross-frequency brain stimulation

E. Raffin, M. Bevilacqua, F. Windel, P. Menoud, R. F. Salamanca-Giron, S. Feroldi, S. B. Zandvliet, N. Ramdass, L. Draaisma, P. Vuilleumier, A. G. Guggisberg, C. Bonvin, L. Fleury, K. R. Huxlin, E. Beanato and F. C. Hummel

4548

Brain regulation of pulmonary dysfunction induced by stroke

M. Chen, C. Wang, M. Chen, Y. Su, Z. Liang, M. Liu, R. Chang, X. Zheng, L. Wang, G. Guo, X. Tang, J. Zhang, X. Feng, T. Xu and W. Xin

4562

Combined magnetic resonance imaging and serum analysis reveals distinct multiple sclerosis types

C. Willard, L. Puglisi, D. Ravi, M. Dmitrieva, R. M. Mattiesing, F. Barkhof, D. C. Alexander, D. E. Harlow, D. Piani-Meier and A. Eshaghi

4578

Book Review

Wanderings of imagination

P. Bartolomeo

4592

Letters to the Editor

Genetic testing for SCA27B in Korean multiple system atrophy

J. Laß, M. Berselli, D. Rioux, S. Schaaake, J. Follett, J. E. Bravo, A. D. Veit, W. Ronchetti, S. B. Reiff, M. J. Huentelman, D. Vuzman, P. Bower, V. Khurana, J. Trinh, B. Jeon, H.-J. Kim and M. J. Farrer

e109

Lack of statistical significance is not evidence against modularity in visual feature processing

J. C. Griffis and A. D. Boes

e112

Reply: Lack of statistical significance is not evidence against modularity in visual feature processing

S. Lugtmeijer, E. H. F. de Haan and H. S. Scholte

e115