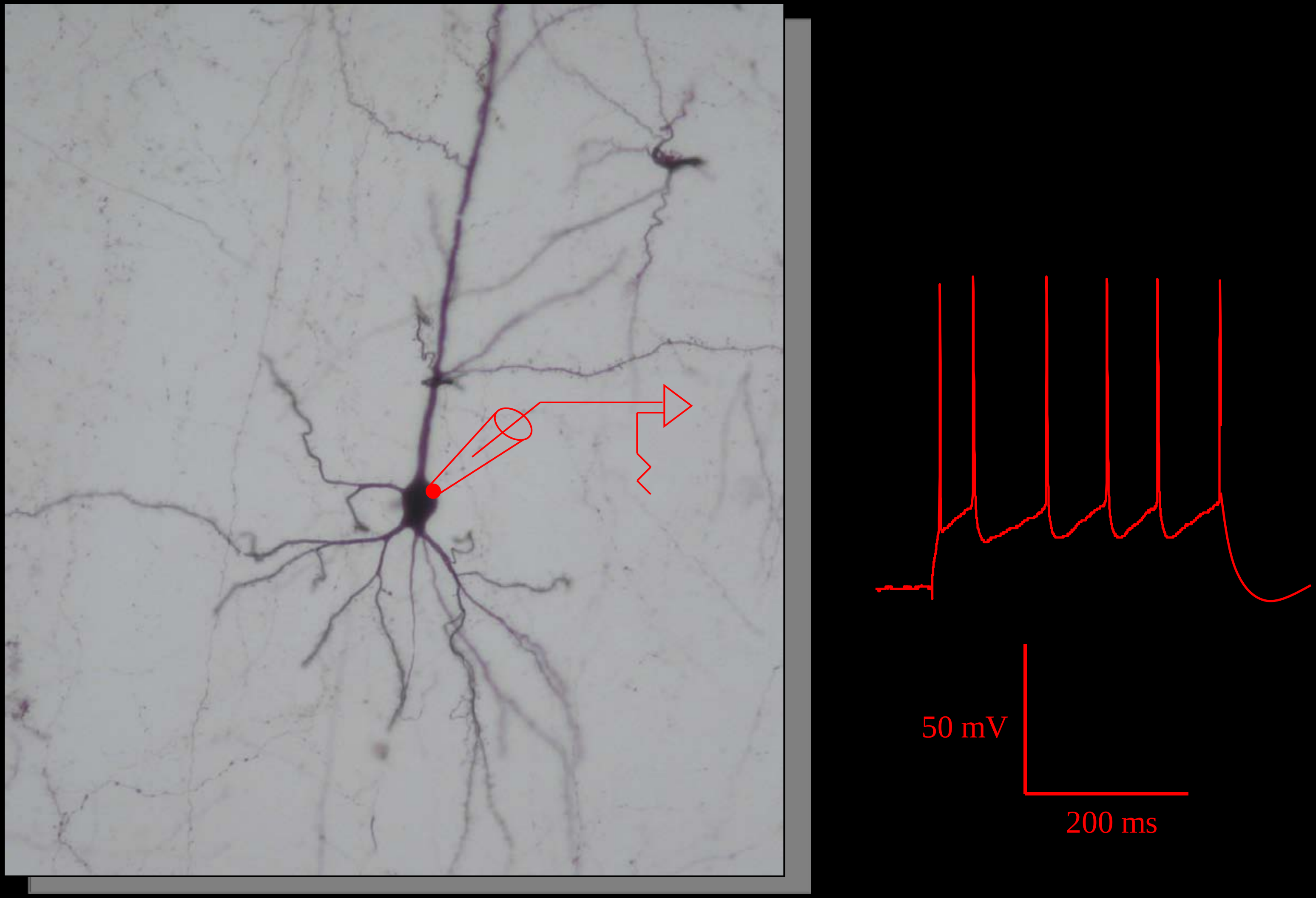
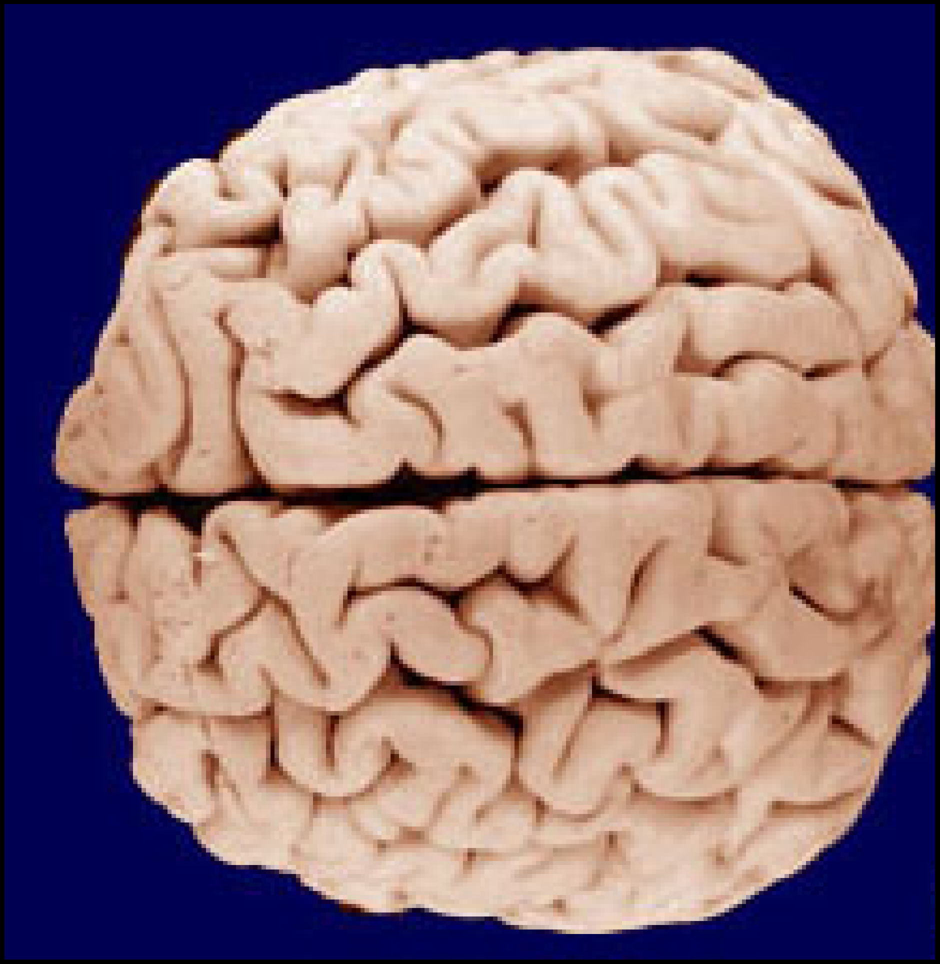
Bisogni Educativi Speciali

Il punto di vista delle Neuroscienze

Alberto Granato - Università Cattolica - Milano
alberto.granato@unicatt.it

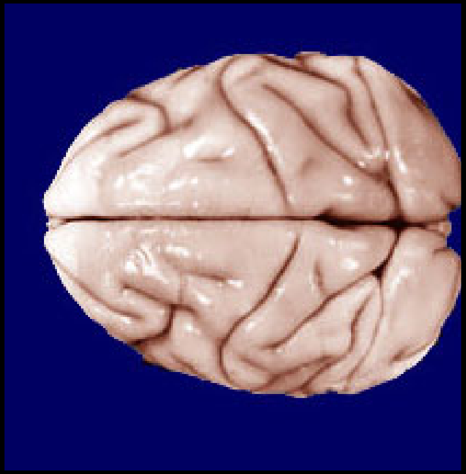

50 mV
200 ms

Homo sapiens

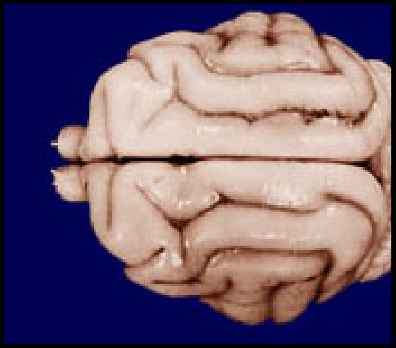


1 cm

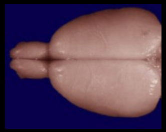
Macaca mulatta

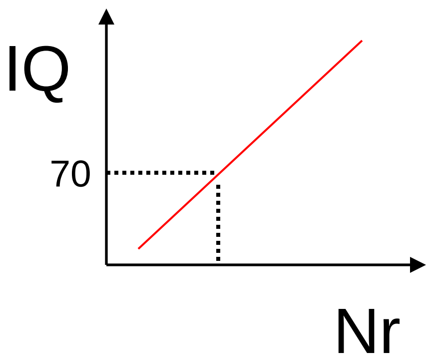


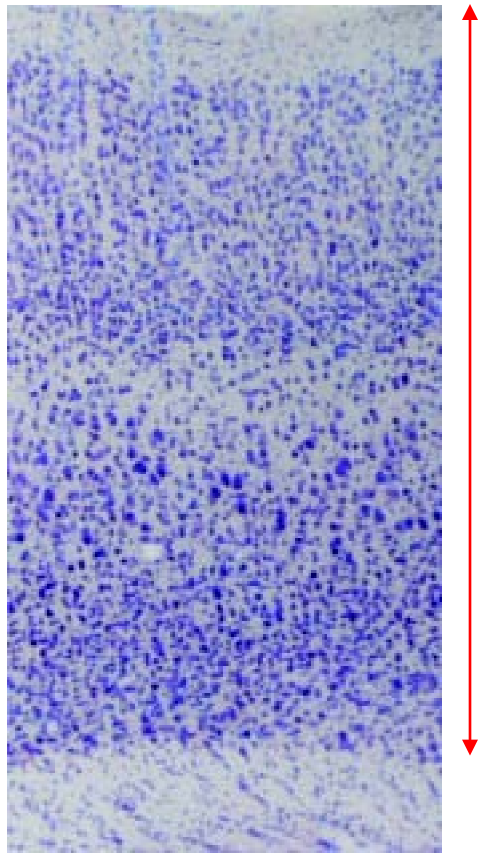
Felis silvestris

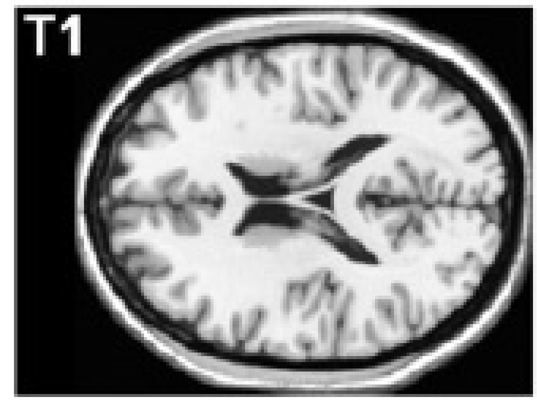


Rattus norvegicus




IQ
70
Nr



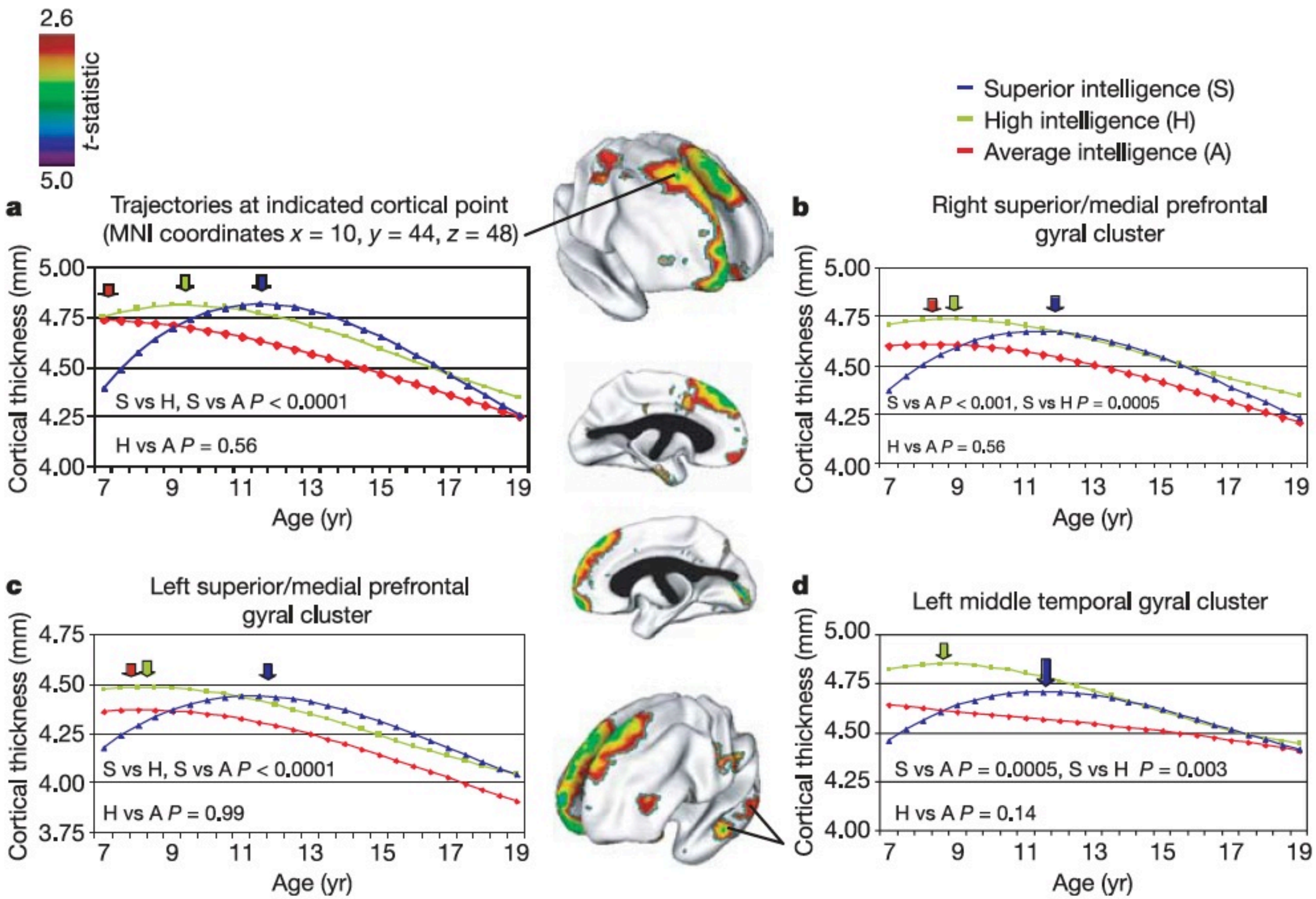

T1

nature Vol 440|30 March 2006|doi:10.1038/nature04513

LETTERS

Intellectual ability and cortical development in children and adolescents

P. Shaw[1], D. Greenstein[1], J. Lerch[2], L. Clasen[1], R. Lenroot[1], N. Gogtay[1], A. Evans[2], J. Rapoport[1] & J. Giedd[1]



Behavioral Neuroscience
2003, Vol. 117, No. 5, 1006–1016

0735-7044/03/$12.00 DOI: 10.1037/0735-7044.117.5.1006

Exercise Increases Hippocampal Neurogenesis to High Levels but Does Not Improve Spatial Learning in Mice Bred for Increased Voluntary Wheel Running

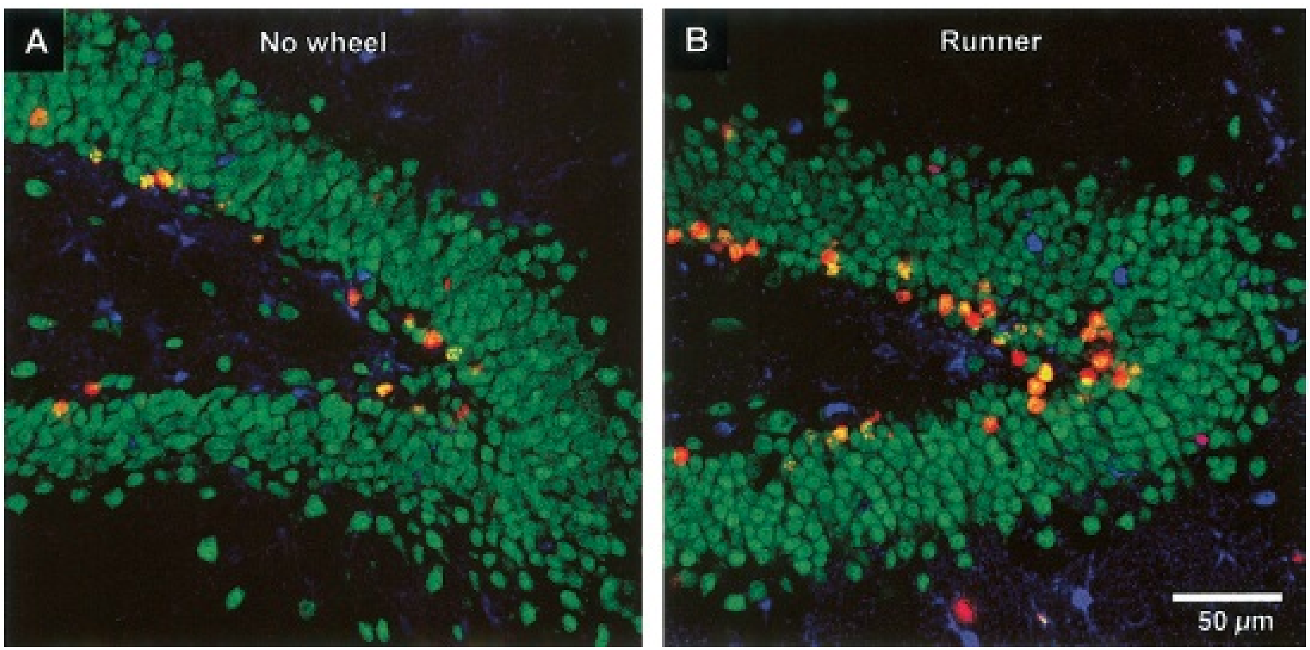
Justin S. Rhodes
University of Wisconsin—Madison

Henriette van Praag
The Salk Institute

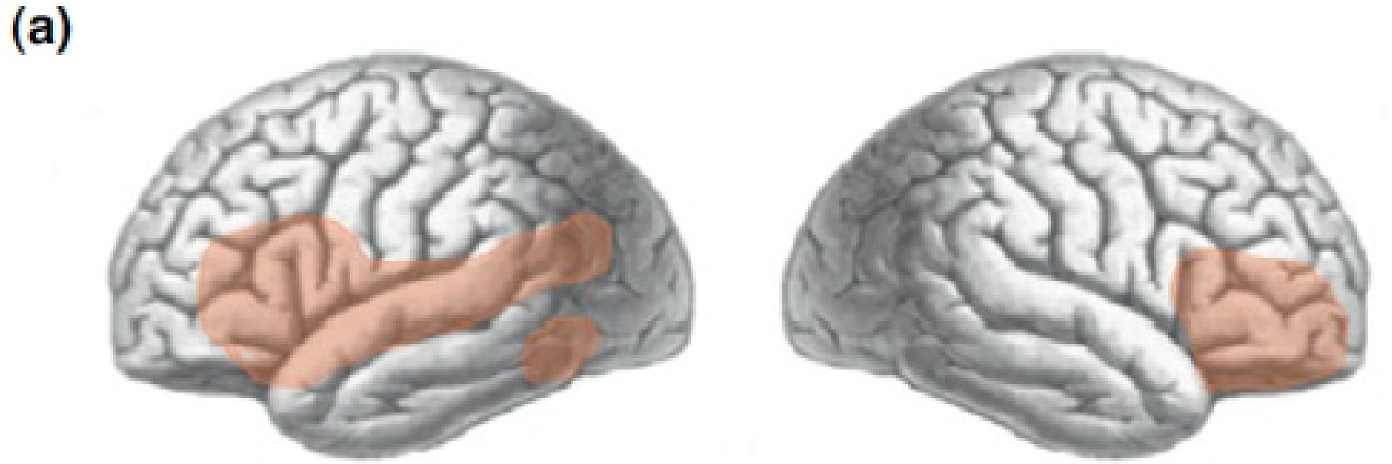
Susan Jeffrey, Isabelle Girard, and Gordon S. Mitchell
University of Wisconsin—Madison

Theodore Garland Jr.
University of California, Riverside

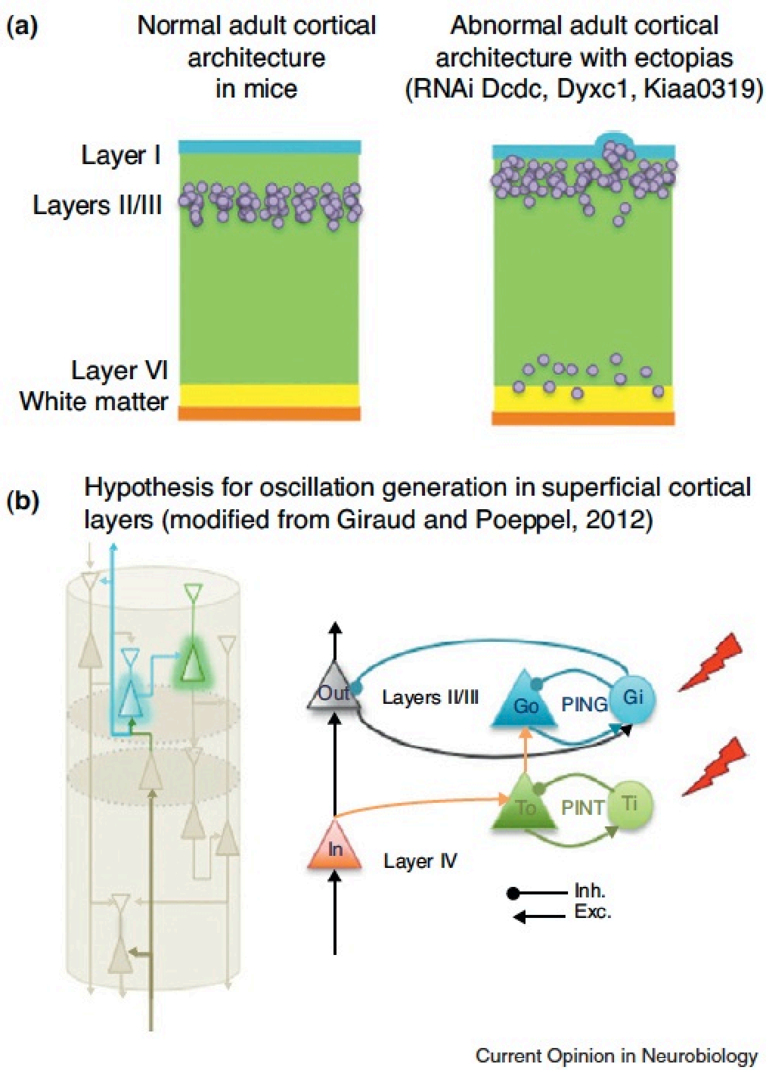
Fred H. Gage
The Salk Institute



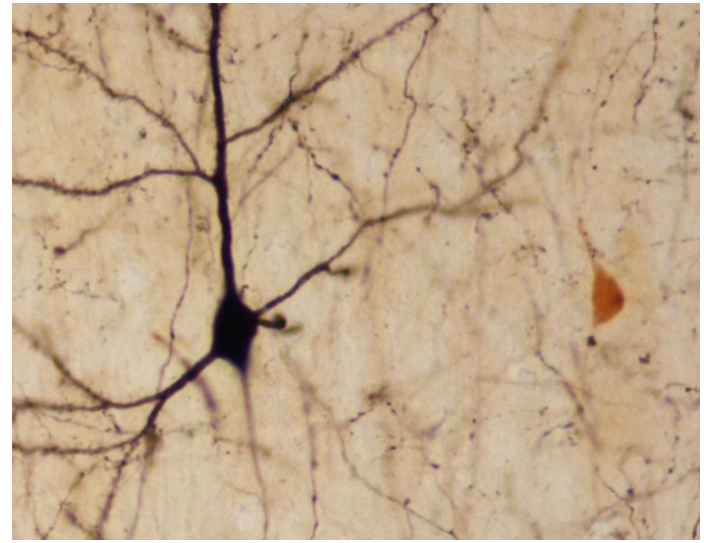
Dyslexia

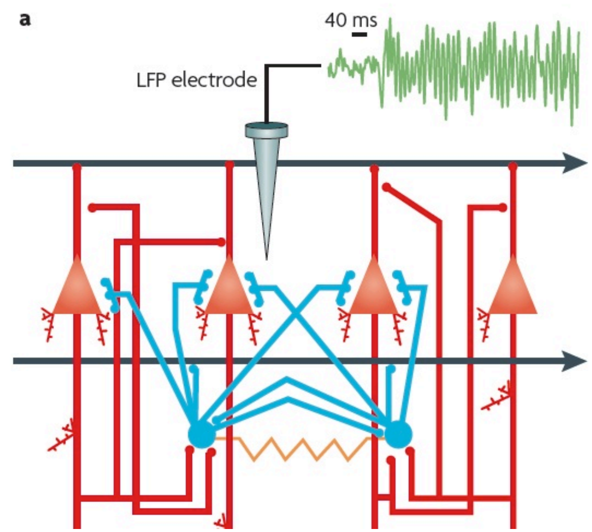


Giraud and Ramus, 2013



Giraud and Ramus, 2013



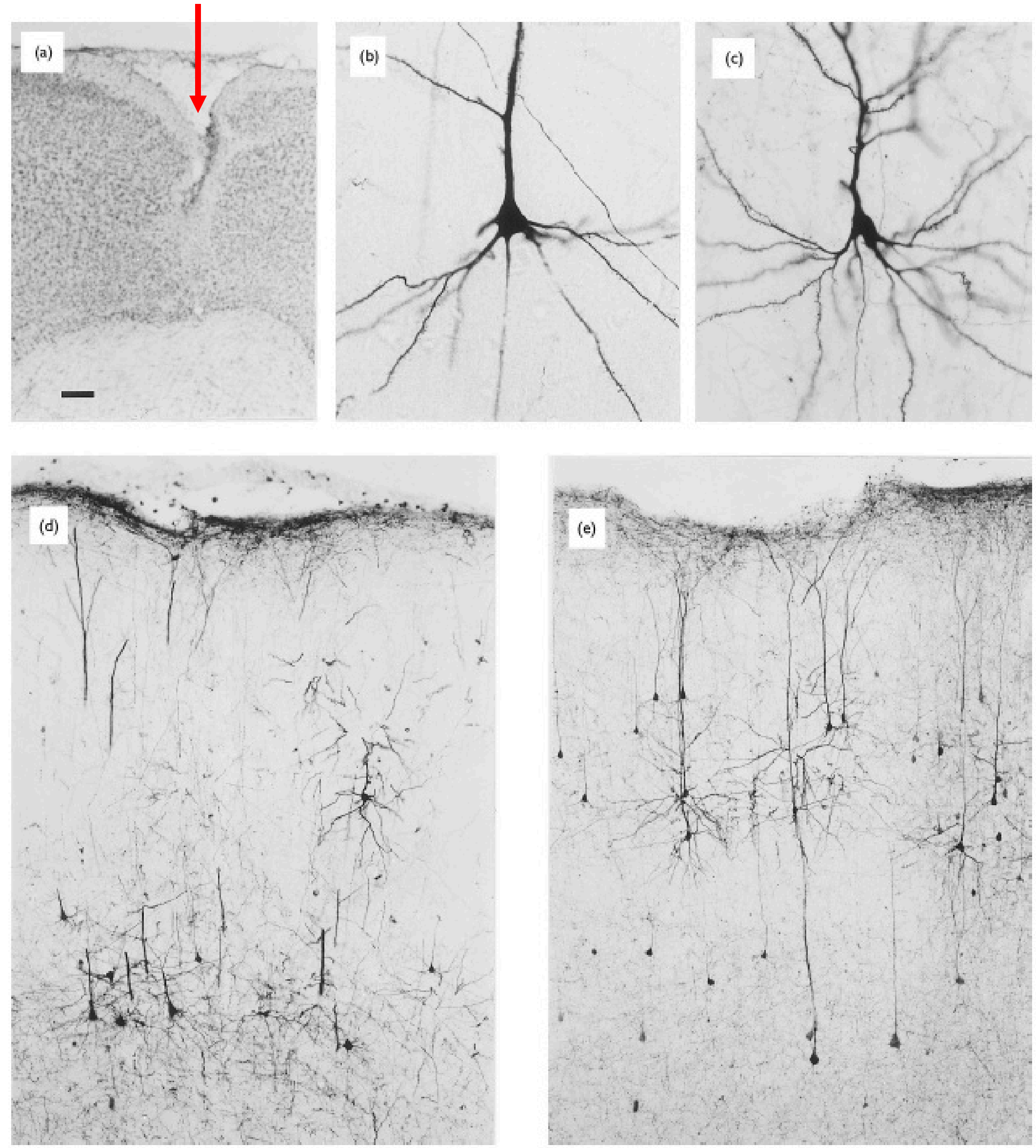


Uhlhaas and Singer, 2010

Organization of cortico-cortical associative projections in a rat model of microgyria

Stefano Giannetti, Pierpaolo Gaglini,[1] Federico Di Rocco,[1] Concezio Di Rocco[1] and Alberto Granato[CA]

Institute of Anatomy and [1]Institute of Neurosurgery, Catholic University Medical School, Largo F. Vito 1, 00168, Rome, Italy

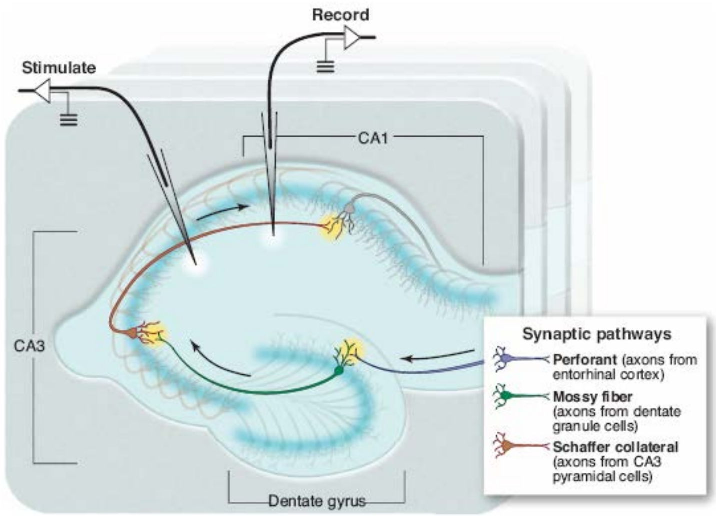


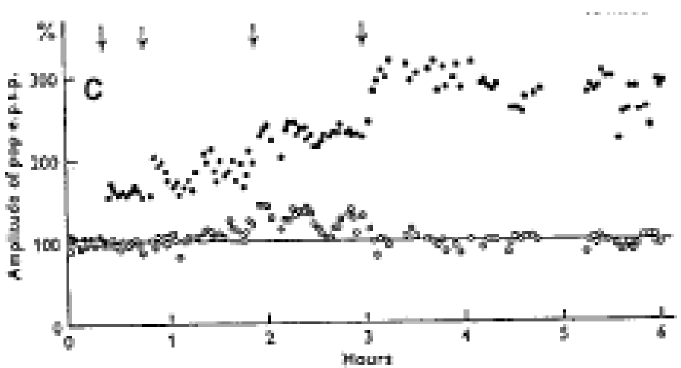
A Ciascuno il Suo Cervello

Ansermet & Magistretti

Responsabilità

Long term potentiation (LTP)



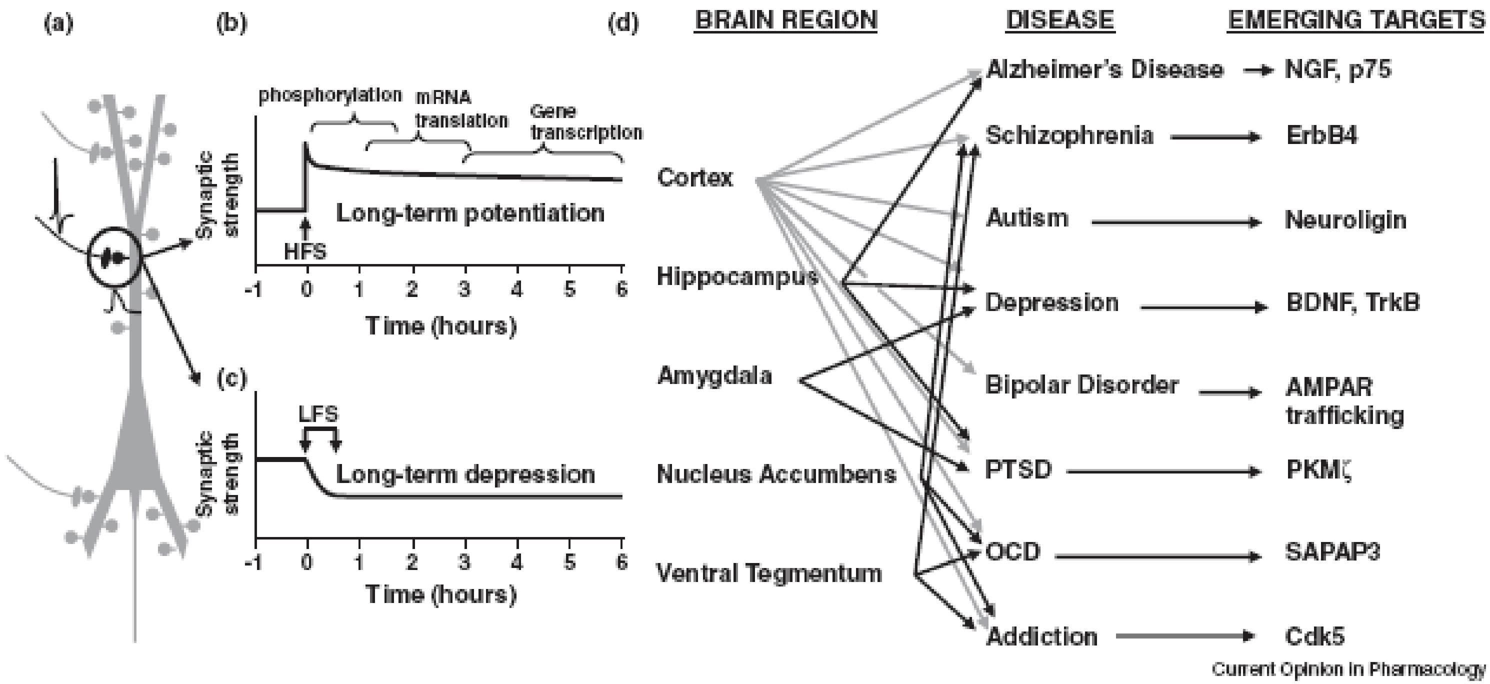


J. Physiol. (1973), **232**, *pp.* 331–356
With 12 *text-figures*
Printed in Great Britain

LONG-LASTING POTENTIATION OF SYNAPTIC TRANSMISSION IN THE DENTATE AREA OF THE ANAESTHETIZED RABBIT FOLLOWING STIMULATION OF THE PERFORANT PATH

BY T. V. P. BLISS AND T. LØMO
From the National Institute for Medical Research, Mill Hill, London NW7 1AA and the Institute of Neurophysiology, University of Oslo, Norway

(*Received 12 February 1973*)


(a)
(b)
(c)
(d)
phosphorylation
mRNA translation
Gene transcription
Synaptic strength
Long-term potentiation
HFS
-1 0 1 2 3 4 5 6
Time (hours)
LFS
Long-term depression
BRAIN REGION
DISEASE
EMERGING TARGETS
Cortex
Hippocampus
Amygdala
Nucleus Accumbens
Ventral Tegmentum
Alzheimer's Disease
Schizophrenia
Autism
Depression
Bipolar Disorder
PTSD
OCD
Addiction
NGF, p75
ErbB4
Neuroligin
BDNF, TrkB
AMPAR trafficking
PKMζ
SAPAP3
Cdk5
Current Opinion in Pharmacology

Cell PRESS

Neuron
Review

The Spike-Timing Dependence of Plasticity

Daniel E. Feldman[1,*]
[1]Department of Molecular and Cell Biology, and Helen Wills Neuroscience Institute, University of California, Berkeley, Berkeley, CA 94720-3200, USA
*Correspondence: dfeldman@berkeley.edu
http://dx.doi.org/10.1016/j.neuron.2012.08.001

ARTICLE IN PRESS

ARCHIVAL REPORT

The Dyslexia-Associated Gene *Dcdc2* Is Required for Spike-Timing Precision in Mouse Neocortex

Alicia Che, Matthew J. Girgenti, and Joseph LoTurco

Dispensare o educare?

Int. J. Devl Neuroscience 27 (2009) 321–328

Contents lists available at ScienceDirect

International Journal of Developmental Neuroscience

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

Early acoustic discrimination experience ameliorates auditory processing deficits in male rats with cortical developmental disruption

Steven W. Threlkeld [a], Courtney A. Hill [a], Glenn D. Rosen [b,c], R. Holly Fitch [a,*]

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Keywords:
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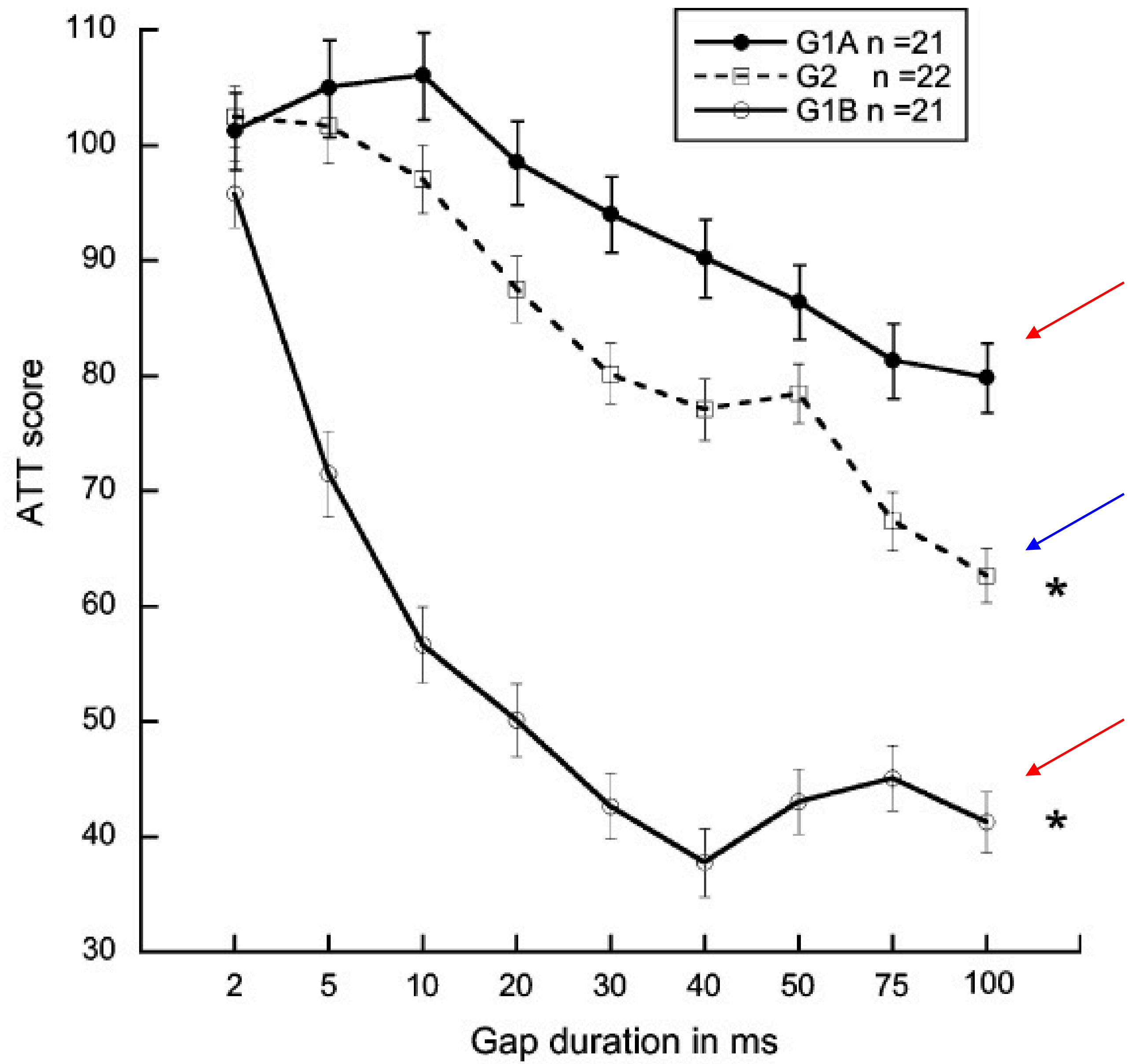
Learning impairment
Plasticity
Cortical developmental pathology
Dyslexia

ABSTRACT

Auditory temporal processing deficits have been suggested to play a causal role in language learning impairments, and evidence of cortical developmental anomalies (microgyria (MG), ectopia) has been reported for language-impaired populations. Rodent models have linked these features, by showing deficits in auditory temporal discrimination for rats with neuronal migration anomalies (MG, ectopia). Since evidence from human studies suggests that training with both speech and non-speech acoustic stimuli may improve language performance in developmentally language-disabled populations, we were interested in whether/how maturation and early experience might influence auditory processing deficits seen in male rats with induced focal cortical MG.

Results showed that for both simple (Normal single tone), as well as increasingly complex auditory discrimination tasks (silent gap in white noise and FM sweep), prior experience significantly improved acoustic discrimination performance—in fact, beyond improvements seen with maturation only.


G1A n =21
G2 n =22
G1B n =21
ATT score
110
100
90
80
70
60
50
40
30
2
5
10
20
30
40
50
75
100
Gap duration in ms
*
*

Neurophysiologie Clinique/Clinical Neurophysiology (2011) **42**, 35—41

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ELSEVIER MASSON

ORIGINAL ARTICLE/ARTICLE ORIGINAL

Infant brain responses associated with reading-related skills before school and at school age☆

Les potentiels liés à l'événement (ERPs) chez le nouveau-né et le nourrisson permettent de prévoir les compétences en lecture en âge préscolaire et scolaire

P.H.T. Leppänen*, J.A. Hämäläinen, T.K. Guttorm, K.M. Eklund, H. Salminen, A. Tanskanen, M. Torppa, A. Puolakanaho, U. Richardson, R. Pennala, H. Lyytinen

Summary

Introduction. — In Jyväskylä Longitudinal Study of Dyslexia, we have investigated neurocognitive processes related to phonology and other risk factors of later reading problems. Here we review studies in which we have investigated whether dyslexic children with familial risk background would show atypical auditory/speech processing at birth, at six months and later before school and at school age as measured by brain event-related potentials (ERPs), and how infant ERPs are related to later pre-reading cognitive skills and literacy outcome.

Patients and methods. — One half of the children came from families with at least one dyslexic parent (the at-risk group), while the other half belonged to the control group without any familial background of dyslexia.

Results. — Early ERPs were correlated to kindergarten age phonological processing and letter-naming skills as well as phoneme duration perception, reading and writing skills at school age.

However, an interesting phenomenon is that also the at-risk children with later typical reading skills showed differences already in their responses to the pitch change at birth as compared to the control group typical readers. The smaller responses in both of the at-risk groups

!

Quei 5 anni di Bliss e Lomo…

Plasticità strutturale

articles

Long-term *in vivo* imaging of experience-dependent synaptic plasticity in adult cortex

Joshua T. Trachtenberg*†, Brian E. Chen*†, Graham W. Knott‡, Guoping Feng§, Joshua R. Sanes§, Egbert Welker‡ & Karel Svoboda*

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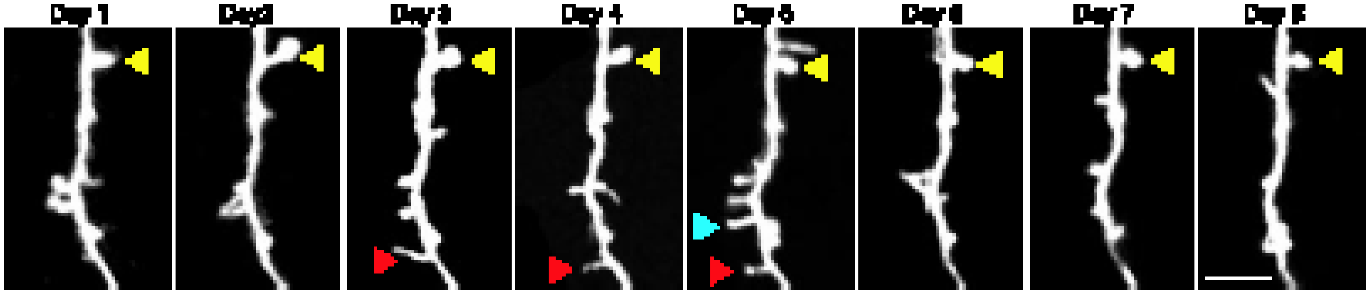
‡ Institut de Biologie Cellulaire et de Morphologie, Université de Lausanne, Rue du Bugnon 9, CH 1005, Lausanne, Switzerland
§ Department of Anatomy and Neurobiology, Washington University School of Medicine, St Louis, Missouri 63110, USA
† These authors contributed equally to this work

Trachtenberg et al., 2002



Organization of cortico-cortical associative projections in a rat model of microgyria

Stefano Giannetti, Pierpaolo Gaglini,[1] Federico Di Rocco,[1] Concezio Di Rocco[1] and Alberto Granato[CA]

Institute of Anatomy and [1]Institute of Neurosurgery, Catholic University Medical School, Largo F. Vito 1, 00168, Rome, Italy

[CA]Corresponding Author

Received 6 April 2000; accepted 26 April 2000

Microgyria was experimentally induced by focal freezing lesions of the frontal cortex in newborn rats. Adult microgyric animals received cortical injections of biotinylated dextran amine combined with NMDA, in order to obtain a Golgi-like retrograde labeling of cortico-cortical association neurons. Injections were performed either rostrally or caudally to the microgyric lesion. Results demonstrate that long-range association projections traveling across the zone of the microgyric lesion arise mainly from infragranular layers. In normal animals the same projections originate both from supragranular and infragranular layers. The analysis of single basal dendrites of layer 2/3 in microgyric animals demonstrates a simplified branching pattern, with a number of end points lower than in control animals. Potential implications for microgyria-associated epilepsy are discussed. *NeuroReport* 11:2185–2189 © 2000 Lippincott Williams & Wilkins.

Key words: Biotinylated dextran amine; Cerebral cortex; Dendrites; Development; Epilepsy; Microgyria; Pyramidal neurons