


Scientific Report  
**2010**



San Raffaele Scientific Institute



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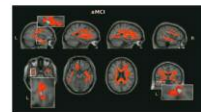


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Research Unit

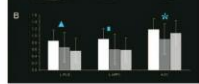


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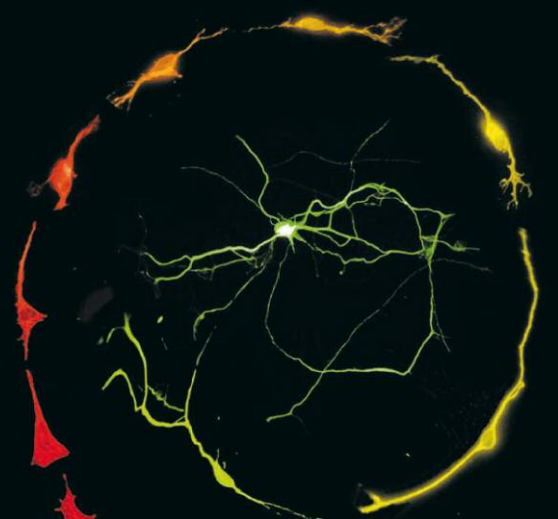
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Neuroimaging of CNS white matter



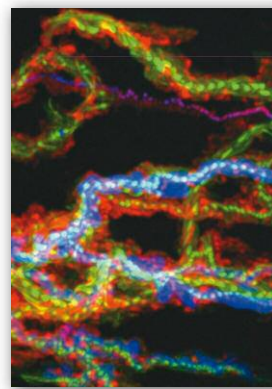
Human Inherited neuropathic Unit  
Regulation of membrane homeostasis in myelination



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Division of Immunology, Transplantation, and Infectious Diseases




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Research Unit



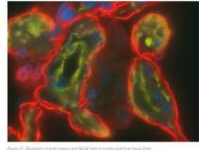
Adriano Lanzetta  
Research Unit

**Research Units**  
 Laboratory Biology Unit  
 Cellular and molecular physiology  
 Human biology  
 Infectious and cancer therapy



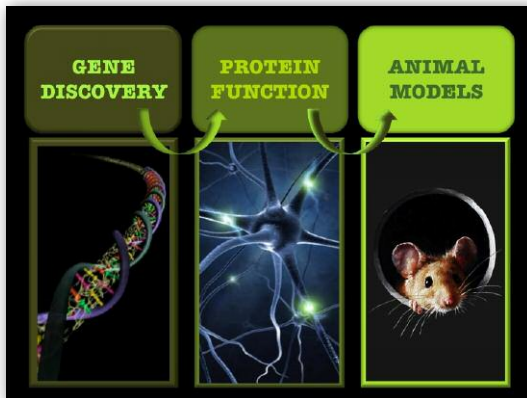
Mouse histopathology

Parameter	Group 1	Group 2	Group 3	Group 4
Parameter 1	100	150	200	250
Parameter 2	120	180	220	280
Parameter 3	140	200	240	300
Parameter 4	160	220	260	320
Parameter 5	180	240	280	340
Parameter 6	200	260	300	360
Parameter 7	220	280	320	380
Parameter 8	240	300	340	400
Parameter 9	260	320	360	420
Parameter 10	280	340	380	440



# Genetics of mental retardation and animal models

**Patrizia D'Adamo**  
 Molecular Genetics of Mental Retardation  
 Unibecco Telethon Institute  
 Division of Neuroscience  
 Vita-Salute San Raffaele University  
 San Raffaele Scientific Institute, Milan



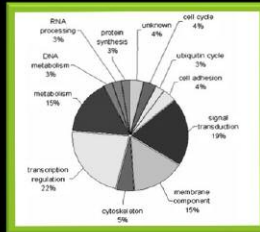
## The ID story started with.....

1860 → 30% men in hospital mental care  
 Association with X-chromosome

2013 → 117 X-linked genes  
 and 50 autosomal genes

The ID phenotype is often associated with ASD

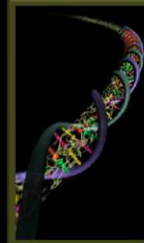
## ID and ASD show a variety of functions



ID and ASD phenotype emerge as alteration at pre- and/or post-synaptic site

Chiruzzesi et al, *Environ Health Perspect* 2008; Liskik et al, *Hum Mol Genet* 2008; Ropers et al, *Curr Opin Genet Dev* 2008

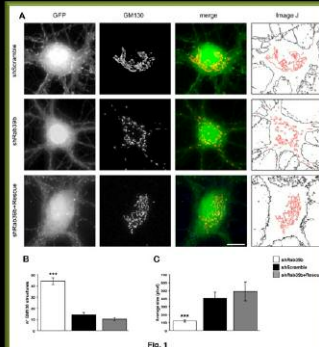
## GENE DISCOVERY



CLN3L109	22.9	NEGN4
HLRUP10210	22.2	CHAL3/STAP
	22.1	ADP1B
	21.3	RNK11/RNKH10
	21.2	AMA10/221
	21.1	BUR4/L120
THUM209	21.0	
ZNF108	11.4	
ZNF102	11.3	
ZNF100	11.2	POPDC10
ZNF104	11.2	PPM1D/10**
ADNP/AMN/AMBRO	11.2	PAP1
RNASEL10	11.1	
ALXN/AN210	11.1	
DIAG1B/90	11	OPIN109
	12	
MEG1	13	SLC16A2/ACT8
ZNF1110	21.1	ALX4/ND
MAGT1/0	21.2	
	21.3	
	22.1	SPRY2
	22.2	
ACSL1/ACSL1/6200	21	ACTR2/83
PIK101/0	21	NMFI1
	21	UPK10A
THO2/10	21	
AMBLES/ATV1/0	21	
AP2/UM2/FRAN1	27	
IKK1/01	27	
<b>GDII (41, 48)</b>	28	
<b>RAB39B (72)</b>	28	

Genomewide Genetic Centers, updated March 2012

## RAB39B silencing



## Gdi1 mouse models and behavioral assessment



## Mutations in the Small GTPase Gene *RAB39B* Are Responsible for X-linked Mental Retardation Associated with Autism, Epilepsy, and Macrocephaly

Maila Giannandrea,<sup>1</sup> Veronica Bianchi,<sup>1</sup> Maria Lidia Mignogna,<sup>1</sup> Alessandra Sirri,<sup>2</sup> Salvatore Carrabino,<sup>2</sup> Errico D'Elia,<sup>1,15</sup> Matteo Vecellio,<sup>1,16</sup> Silvia Russo,<sup>3</sup> Francesca Cogliati,<sup>3</sup> Lidia Larizza,<sup>3,4</sup> Hans-Hilger Ropers,<sup>5</sup> Andreas Tzschach,<sup>5</sup> Vera Kalscheuer,<sup>5</sup> Barbara Oehl-Jaschkowitz,<sup>6</sup> Cindy Skinner,<sup>7</sup> Charles E. Schwartz,<sup>7</sup> Jozef Geicz,<sup>8,9</sup> Hilde Van Esch,<sup>10</sup> Martine Raynaud,<sup>11</sup> Jamel Chelly,<sup>12</sup> Arjan P.M. de Brouwer,<sup>13</sup> Daniela Toniolo,<sup>2,14</sup> and Patrizia D'Adamo<sup>1,\*</sup>

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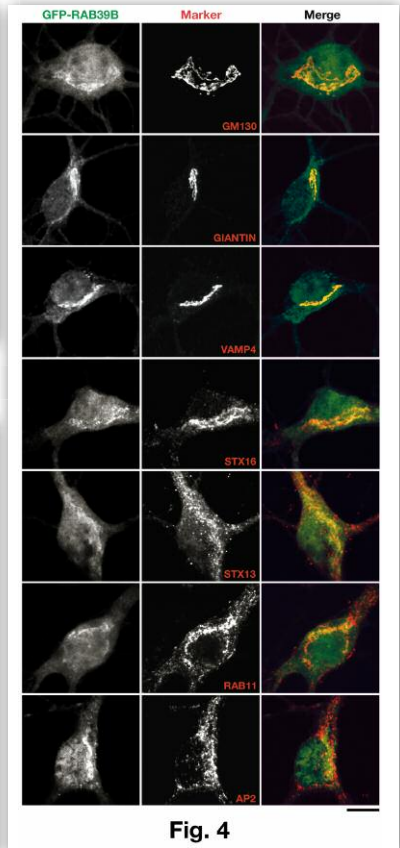


Fig. 4

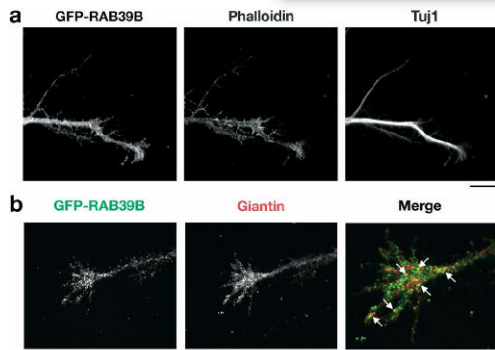


Fig. 6

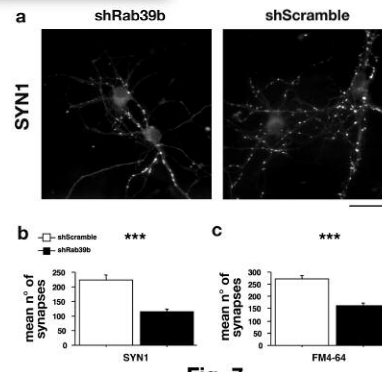


Fig. 7

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PLOS one

## Forebrain Deletion of $\alpha$ GDI in Adult Mice Worsens the Pre-Synaptic Deficit at Cortico-Lateral Amygdala Synaptic Connections

Veronica Bianchi<sup>1,3</sup>, Frédéric Gambino<sup>2,3,3</sup>, Luca Muzio<sup>4</sup>, Daniela Toniolo<sup>5</sup>, Yann Humeau<sup>2,6</sup>, Patrizia D'Adamo<sup>1,\*</sup>

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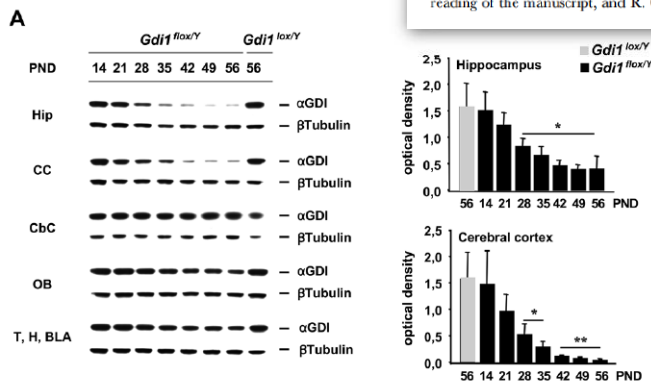


Fig. 2

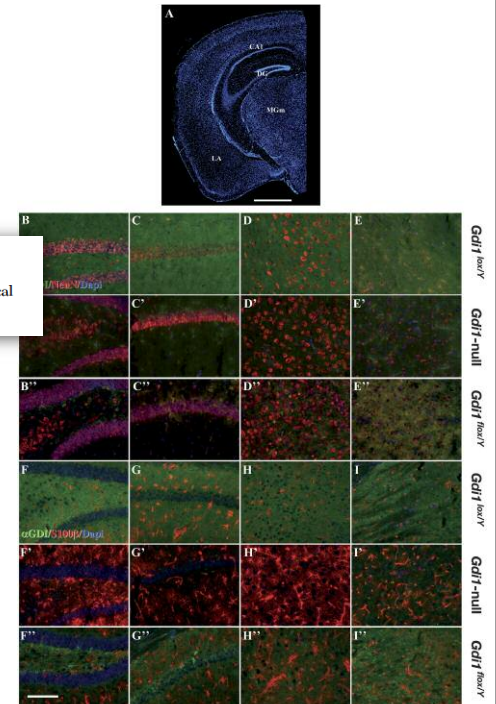


Fig. 3