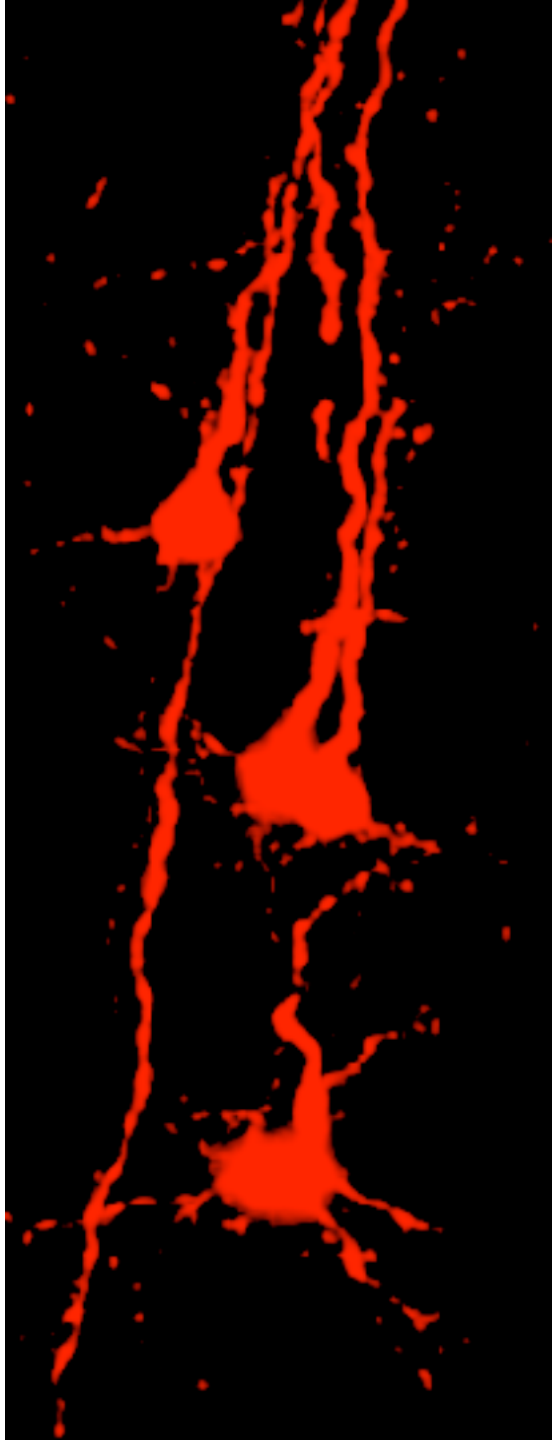


Robert F. Hevner, MD, PhD

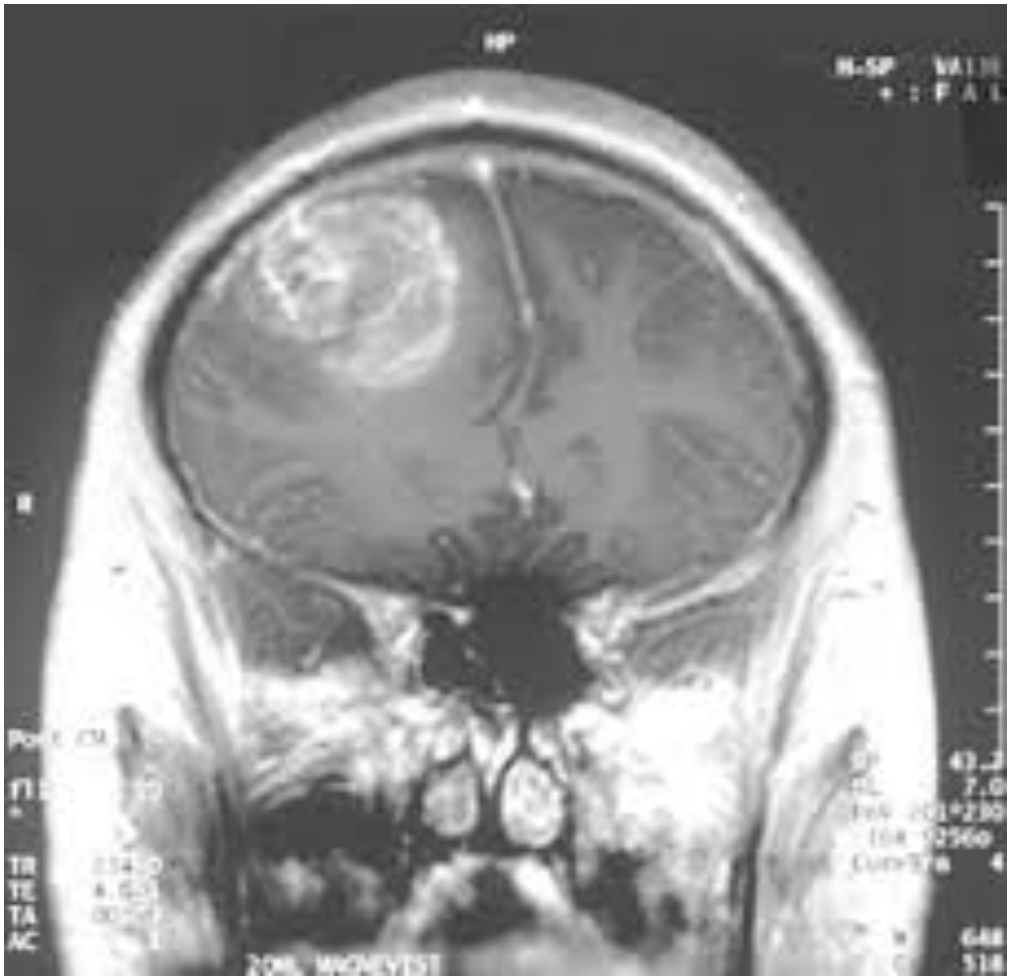
Director of Neuropathology

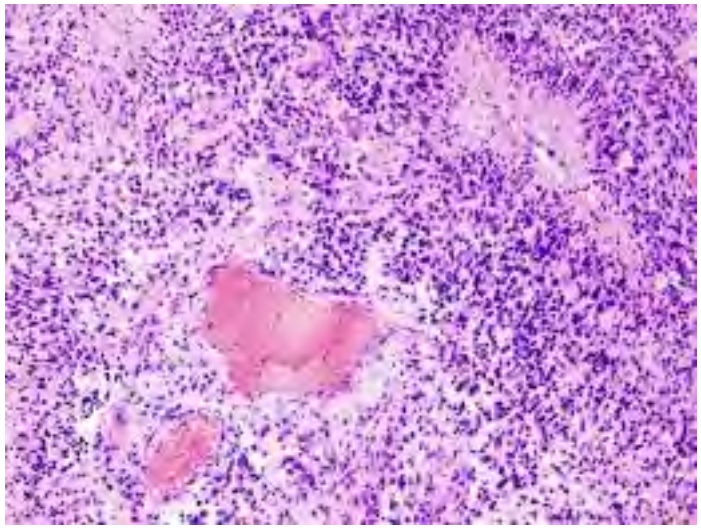
UCSD Research IT Showcase

Atkinson Hall, JSOE

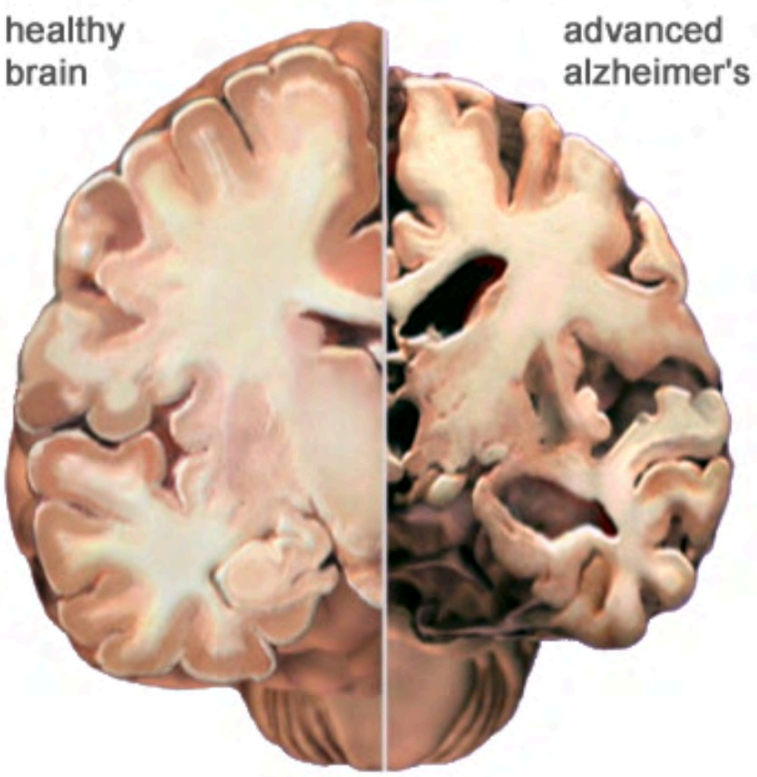
10/23/2018

Glioblastoma





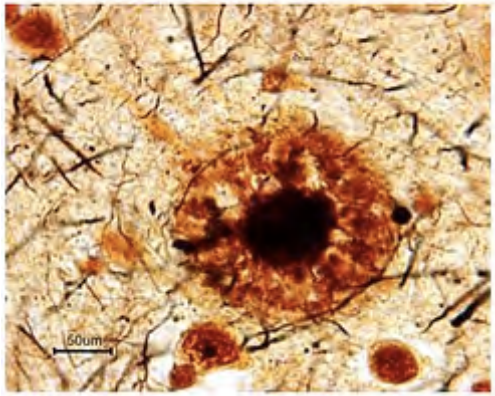
Alzheimer's Disease



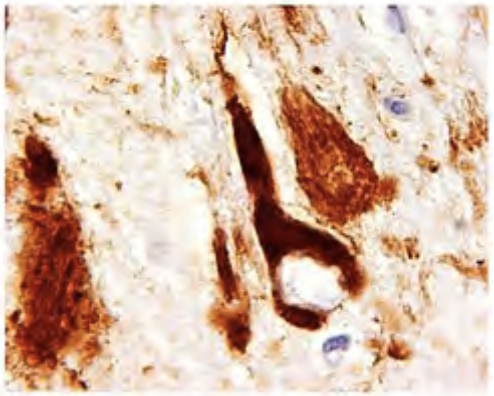
University of California, San Diego

Shiley-Marcos
Alzheimer's Disease
Research Center

Plaques

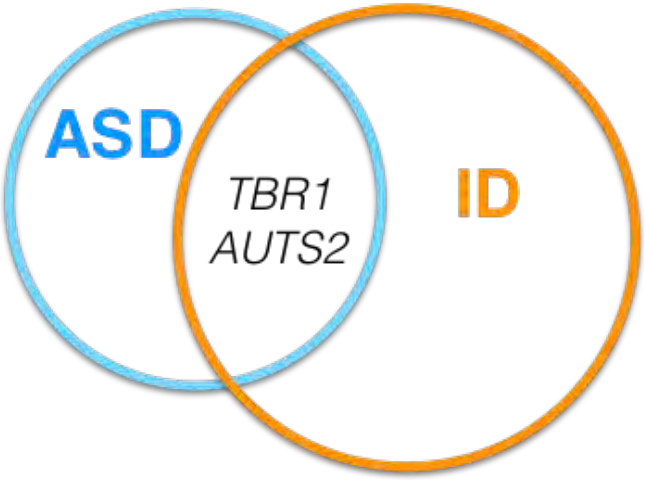


Neurofibrillary Tangles

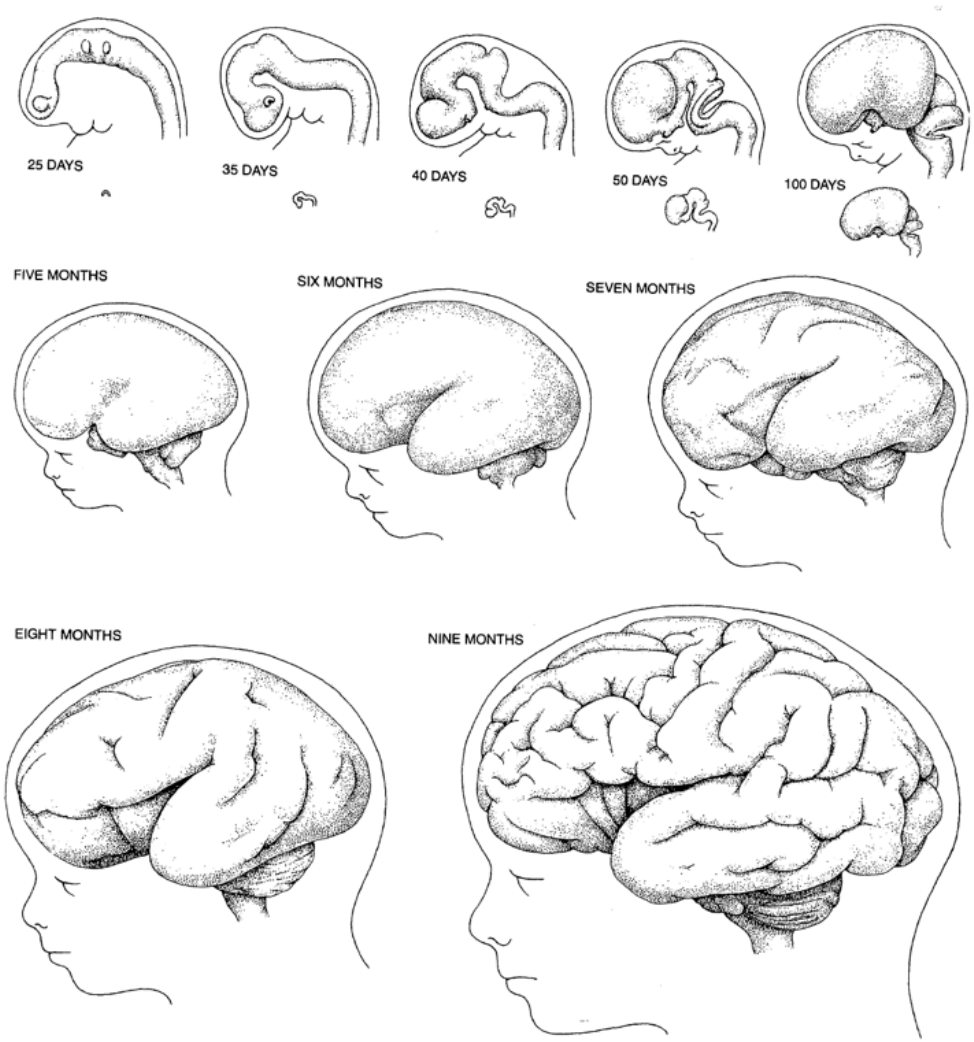


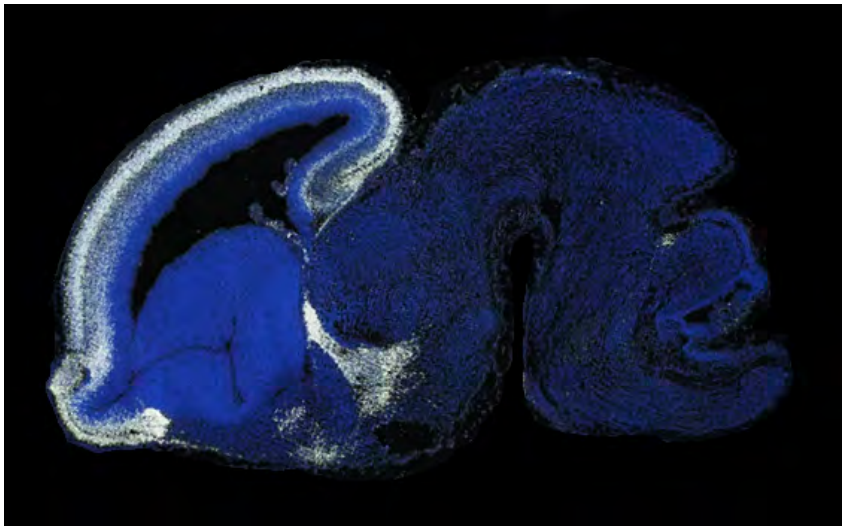
TBR1 : A Neurodevelopmental Disease Gene

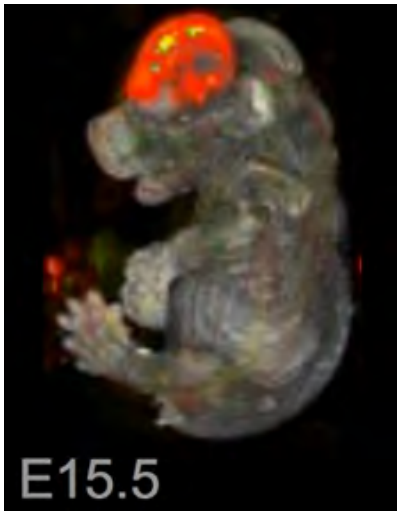
- Intellectual Disability – 100%
- Autism – 74%
- Neurological (e.g epilepsy) – 82%



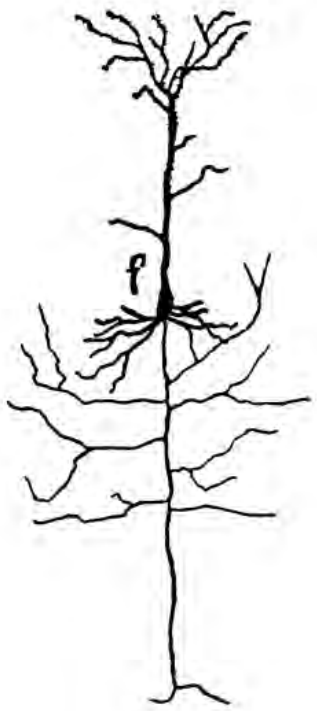
T-brain-1 (TBR1) is a Transcription Factor Expressed in Developing Cerebral Cortex

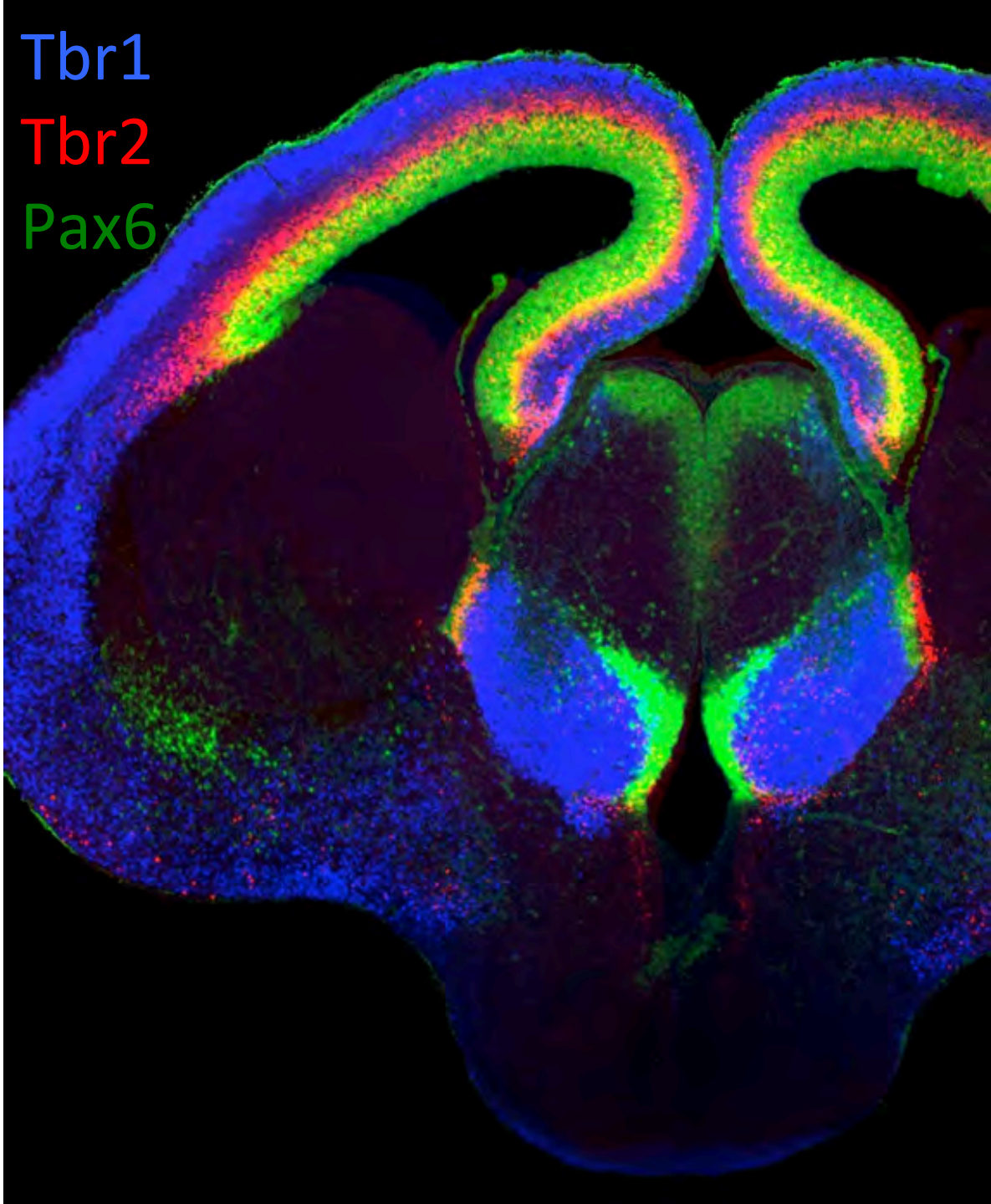




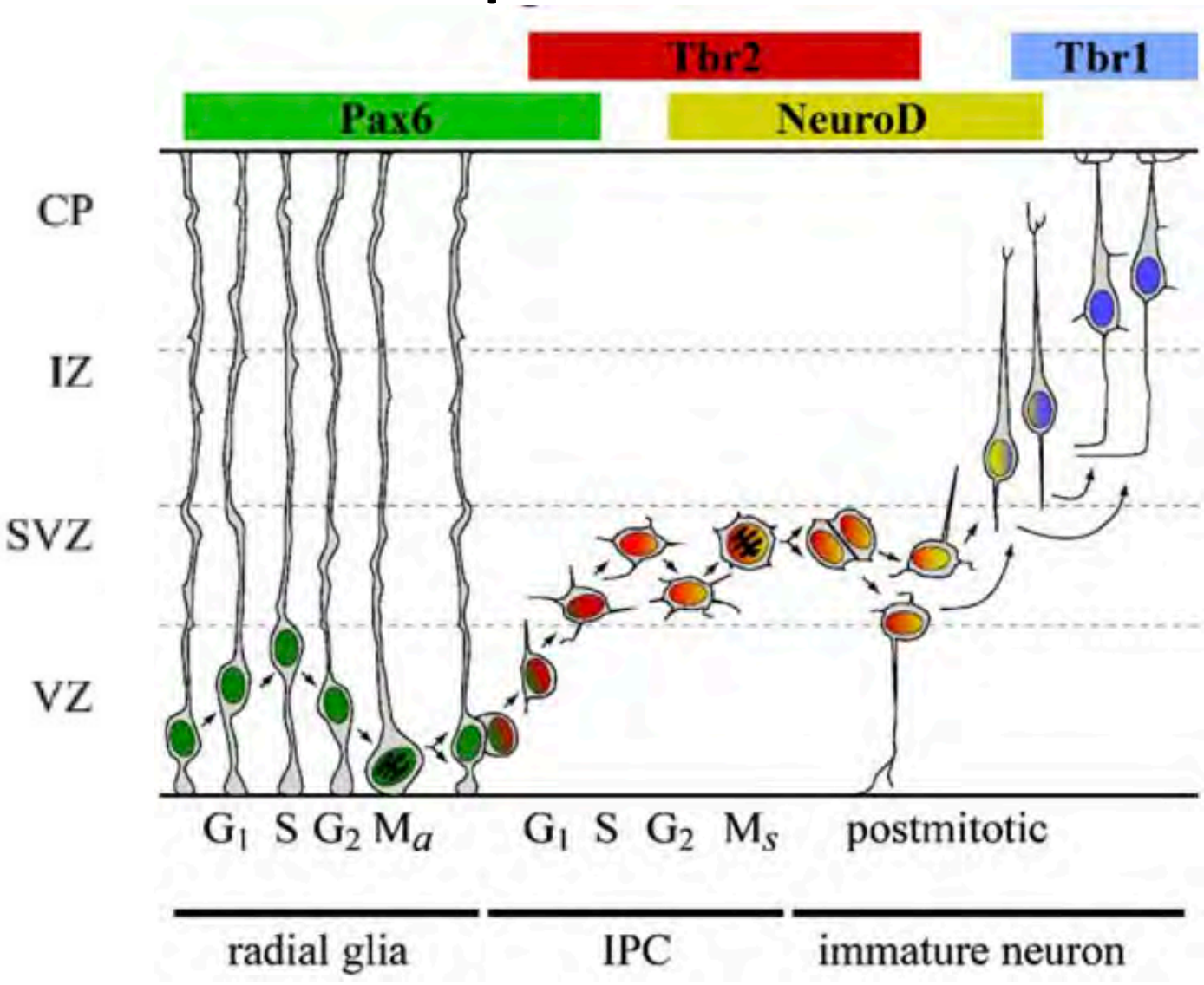


Tbr1 is expressed in the cortical plate where new neurons differentiate



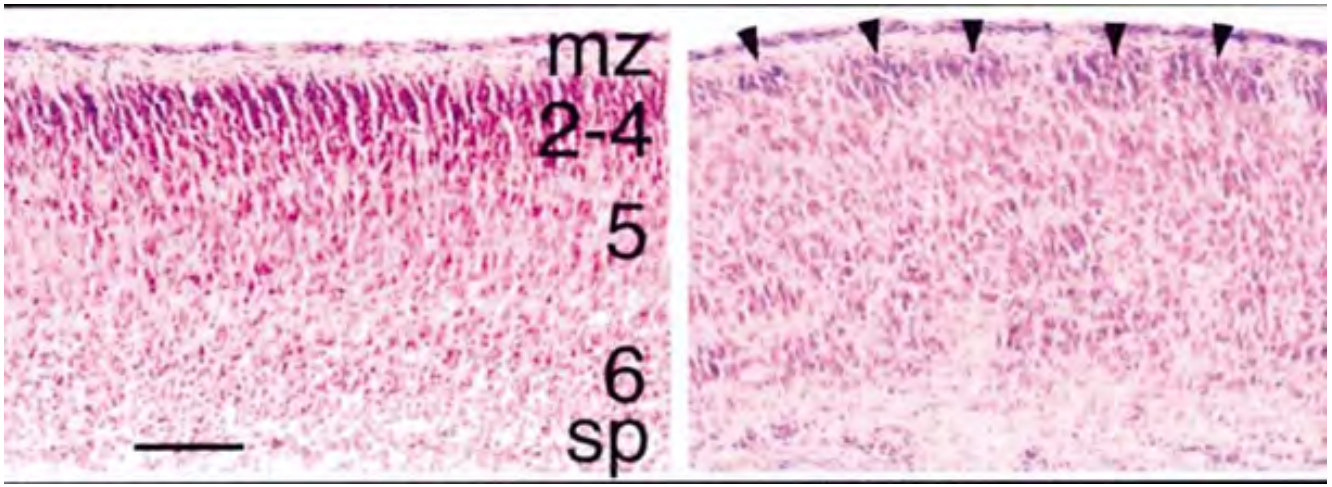


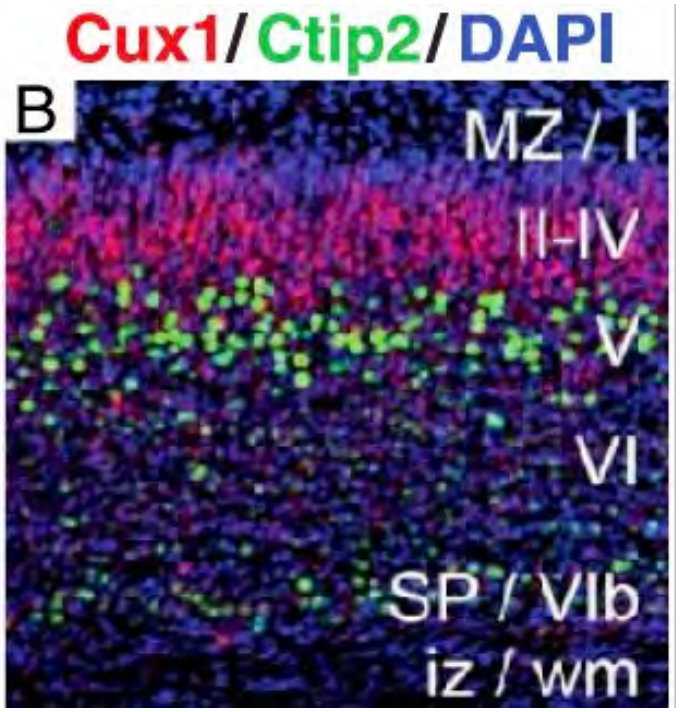
Tbr1 is expressed in cortex neurons

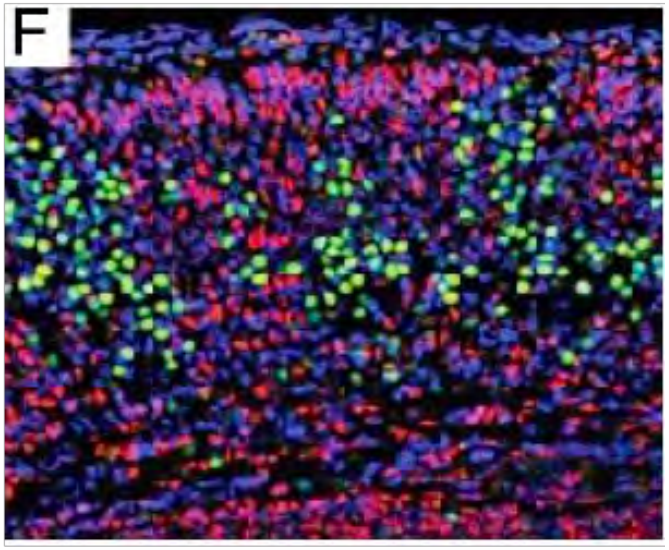


R.F. Hevner et al. / Neuroscience Research 55 (2006) 223–233

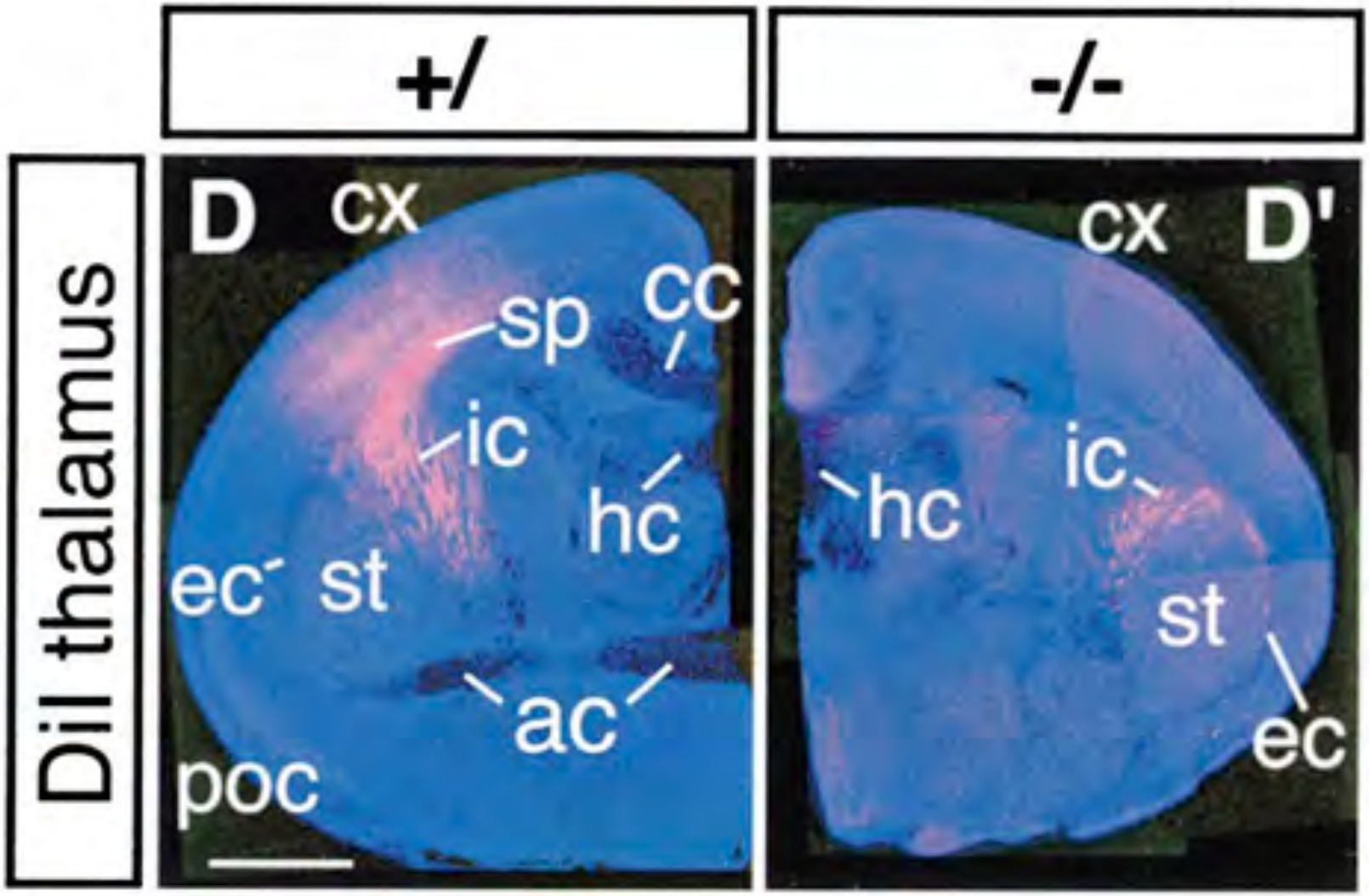
Tbr1 mutant mice have disorganized cortical layers



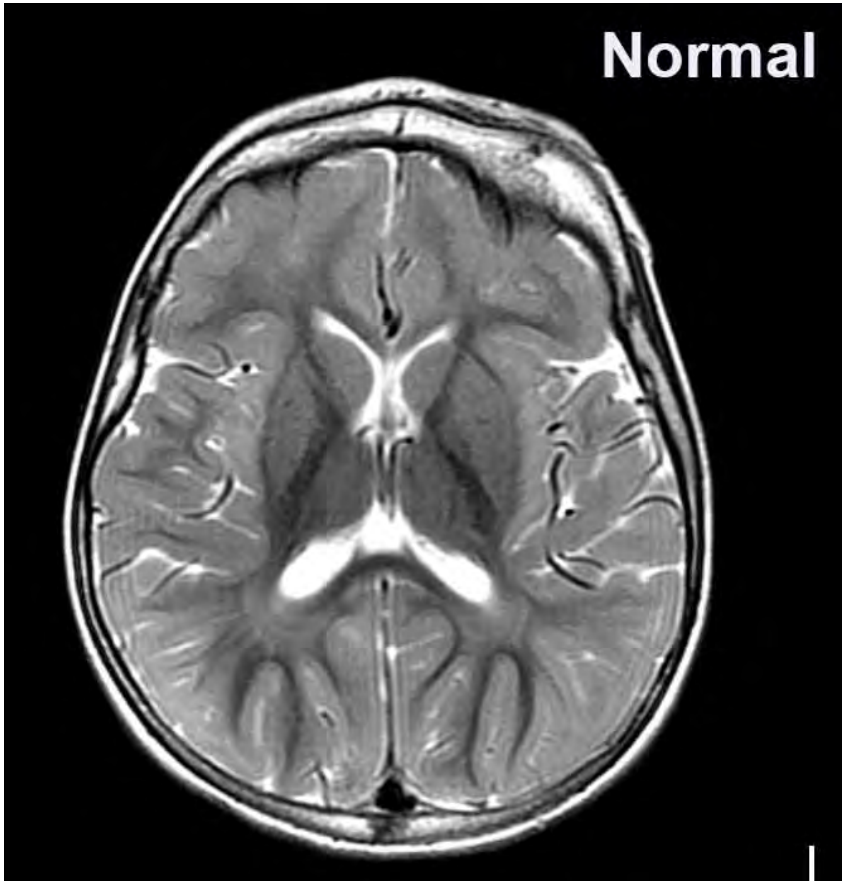


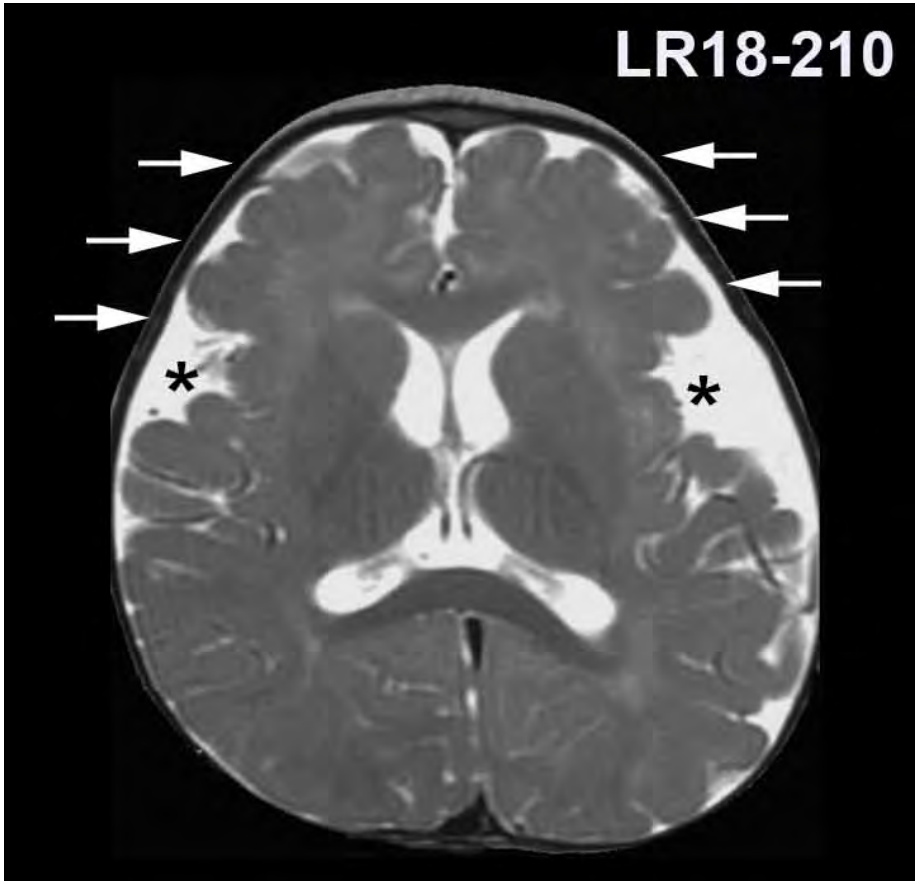


Tbr1 mutant mice have abnormal neural connections between the thalamus and cerebral cortex



Humans with pathologic *TBR1* variants have cortical dysplasia (abnormal growth & development)





Thus ID and ASD in *TBR1* syndrome are due to abnormal cortical organization & Connections

How We Intensively Use Computers and Data

1. Microscopy: modern microscopes are run with computers
   - Digital images & confocal slices (RGB) - MB sizes
   - Confocal stacks − 10's of MBs
2. Time-lapse video microscopy: multiple computers involved
   - 100's of MBs
3. Data Storage and Connectivity
   - Local storage rapidly fills on imaging computers
   - Servers & connectivity (internet) are essential

Time-lapse video of dividing cortical progenitors

UNIVERSITY of CALIFORNIA, SAN DIEGO

SCHOOL OF MEDICINE

Sanford Consortium for Regenerative Medicine

UCSD Jacobs Medical Center

Thank you!

UC San Diego

"Surely there's an easier way of moving files?"

UC San Diego

Goal

Transfer the Hevner lab's ~8 TB worth of research data from Seattle to UCSD safely and securely.

Hevner Data

Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION

Sanford Consortium
FOR REGENERATIVE MEDICINE

SCRI Network:

*Fort Knox like security because of Personal Health Information (PHI).

*Hospital servers

*No administrator rights on lab's workstations

*Guardian Edge encryption on everything!

Transfer Options

1. SECURE FTP

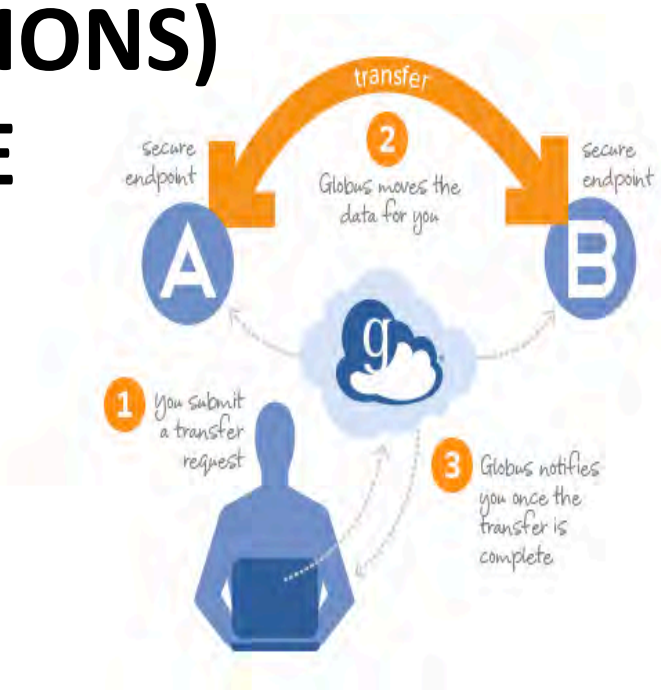
-UCSD FIONA

2. SECURE CLOUD SERVICE

-GLOBUS (BOTH INSTITUTIONS)

3. EXTERNAL HARD DRIVE

-NOT RECOMMENDED

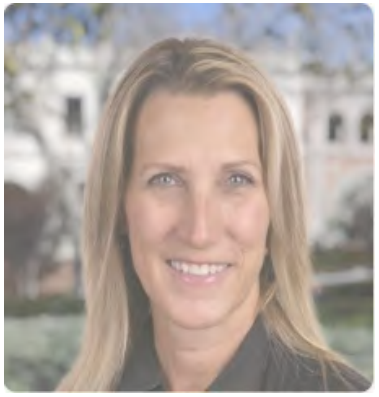


UCSD Research IT team:

*Cyd Burrows-Schilling

*Claire Mizumoto,

Director Res IT Svcs



Globus-Paul Hodor

SCRI IT-Russell Ison

Ongoing Projects!
Network imaging computers for both Hevner lab and Sanford Consortium with help from Research IT

THANK YOU for your attention!