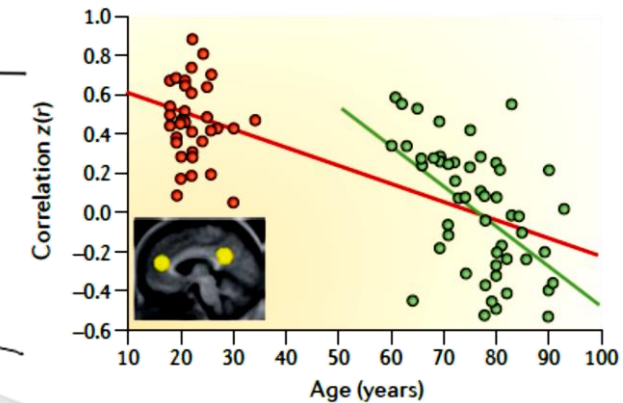
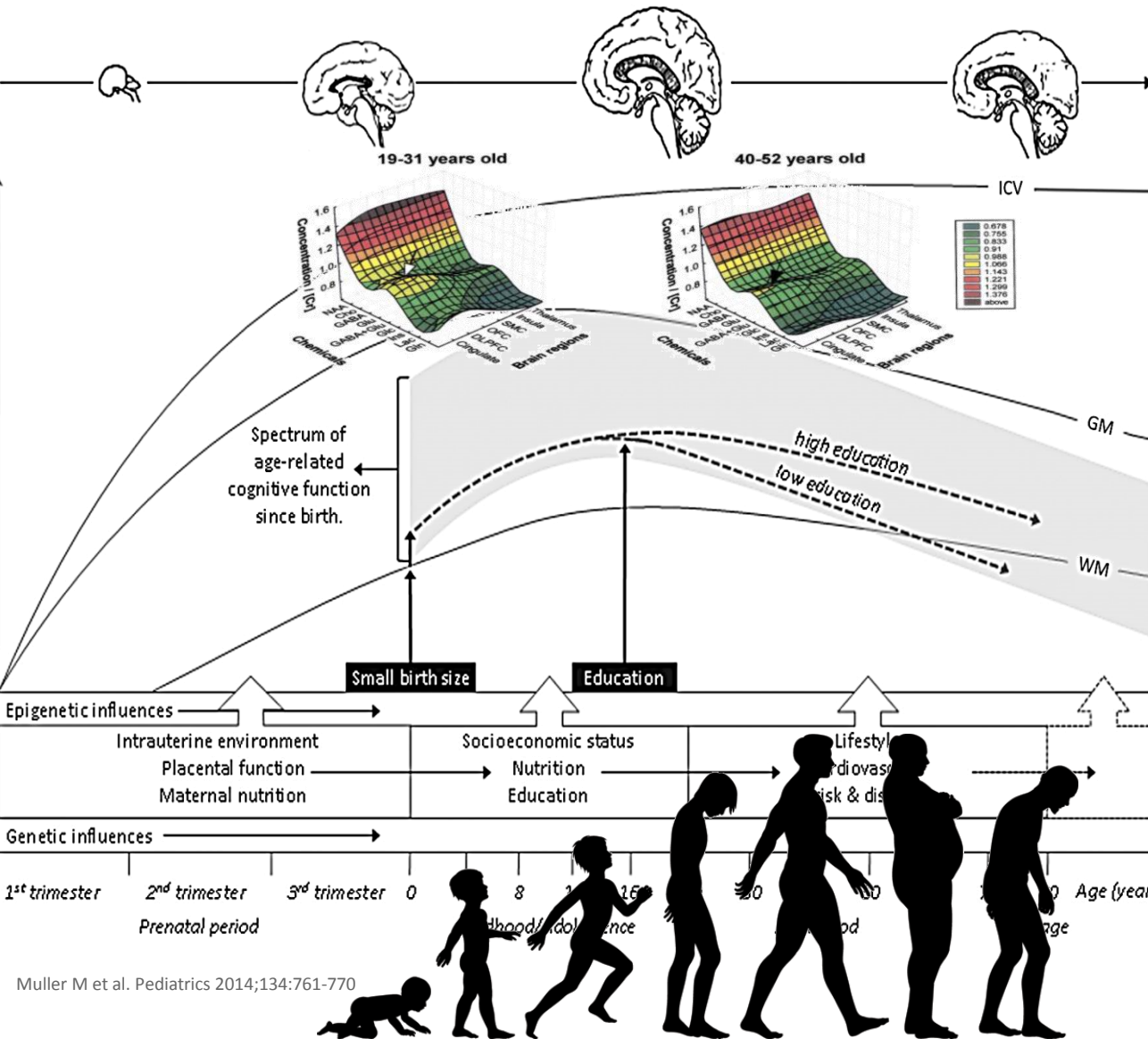
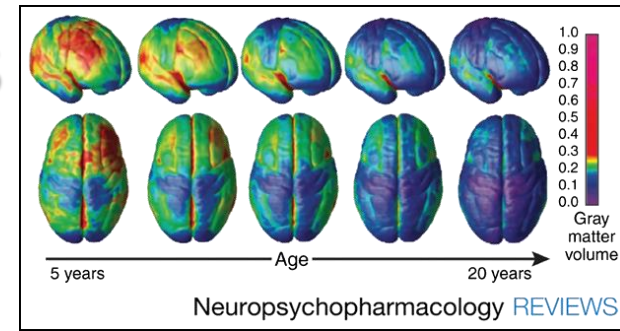




Grady C et al. Nat Rev Neurosci. 2012; 13(7):491-505.

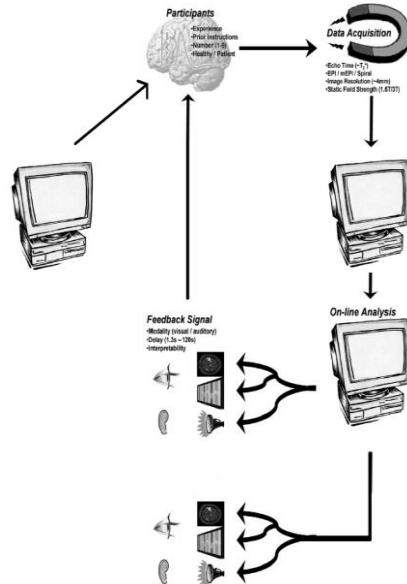
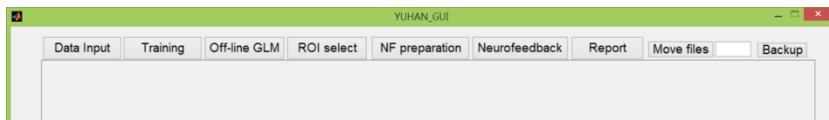
- technology research and development (R & D)
- ✓ real-time fMRI
- ✓ MRS techniques
- Research topic focus on aging & life span.

R & D(real time fMRI)

Objective 1 : real-time fMRI system

- **MRI scanner – Data acquisition**
Real-time data transmission
- **MRI console – Image reconstruction**
Ex., BrainWavERT brain mapping software – Data Quality [GE]
- **Data analysis**
Real-time data analysis
✓ **Real time preprocessing**
Ex., Linear motion correction - AFNI (Cox 1996)
Spatial smoothing and drift correction [Magland et al., 2011]
✓ **Real time statistical analysis**
Ex., partial correlation coefficient - AFNI (Cox 1996)
GLM - Incremental approach
GLM - sliding window approach

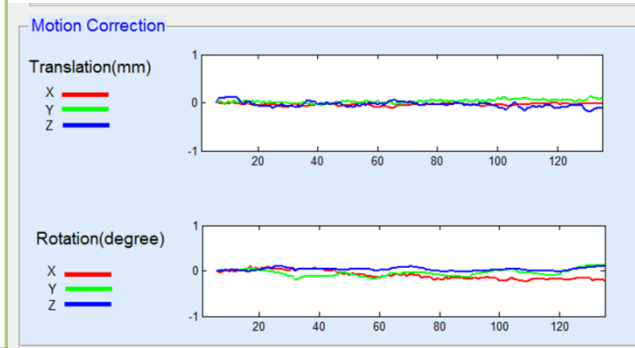
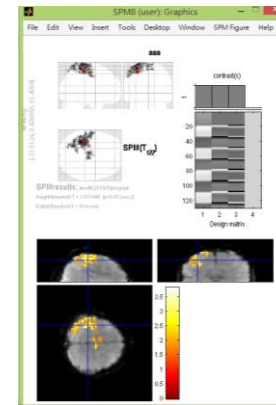
1.Interface



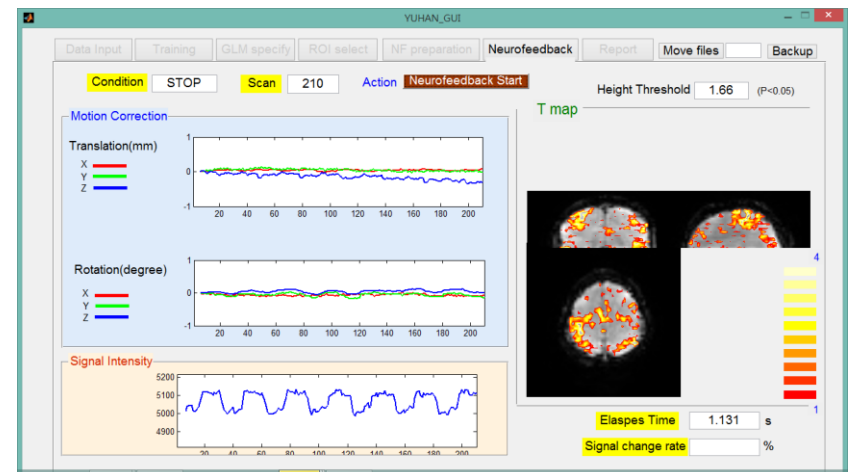
Member :

Prof. M. L. Wu ; Prof. T. C. Chao; Prof. E. R. Liu ; Prof. K. C. Wen;
Prof. T. C. Chuang ; Prof. S. L. Hsieh; Prof. F. Z. Shaw ; Prof. D. Y. Chen
Prof. C. C. Kung ; Prof. C. Y. Lin

2. Motion correction



3. Neurofeedback



R & D(MRS)

Objective 2 : Developing and coding program on MRS Proton MR Spectroscopy Pulse Sequence.

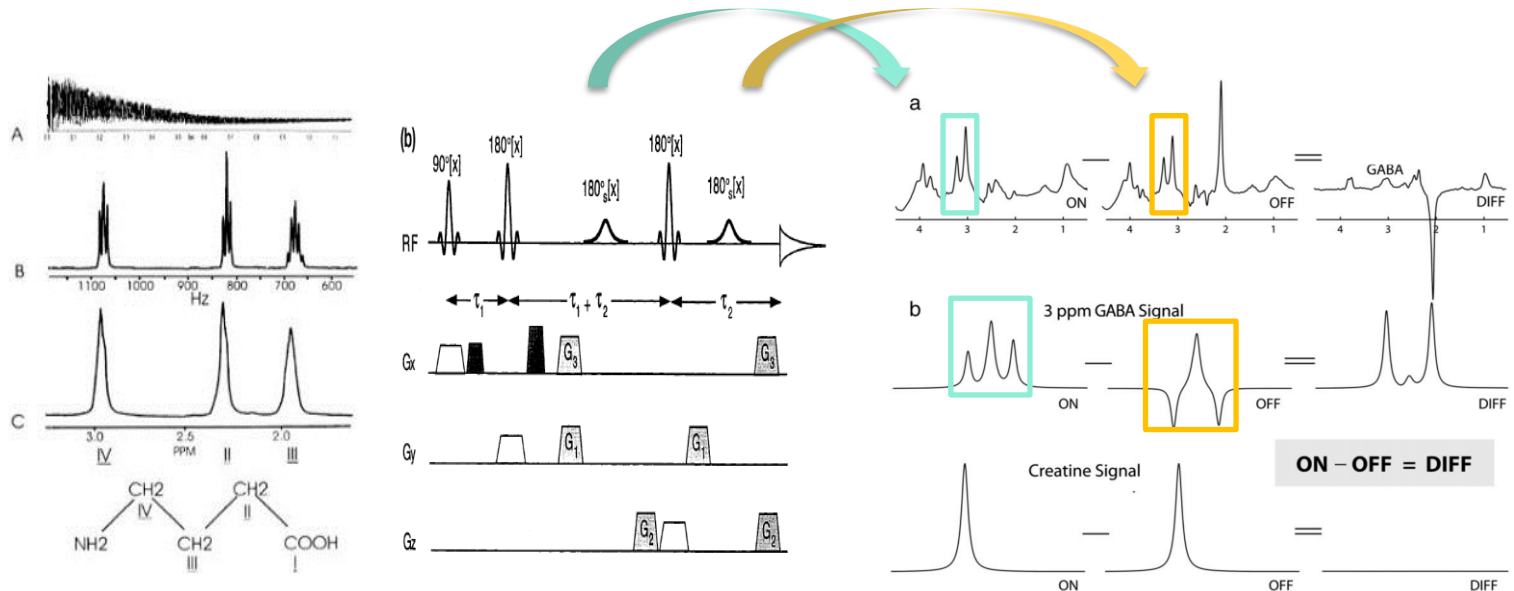
Ex. Using MEGA-PRESS measured γ -Aminobutyric acid.

GABA(γ -Aminobutyric acid), an inhibitory neurotransmitter, plays an important role in cognition, such as memory, emotion, conscientiousness and attention.

FID

J coupling

Triplet GABA



- ✓ **More GABA, less distraction.** (Sumner et al, 2010)
- ✓ **Decrease GABAergic mediated synaptic inhibition in the hippocampus, enhance memory.** (Collinson et al, 2002)
- ✓ **GABA Enhancement in MPTA induced loss of consciousness.** (Sukhotinsky et al, 2007)
- ✓ **Higher level of GABA reduces mood disorders.** (Brambilla et al., 2003)
 - mesopontine tegmental anesthesia area (MPTA)