

The Changing Brain: From Depression to Recovery



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Research Interests: Investigating biological markers
for suicidality

Brain Health Wellness Tip: Creative writing and
photographing things that inspire you



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St. Michael's



Arthur Sommer Rotenberg
Chair in Suicide Studies



Who is at Risk for Depression?



Female Gender
Low Income
Life Stressors
Social Isolation



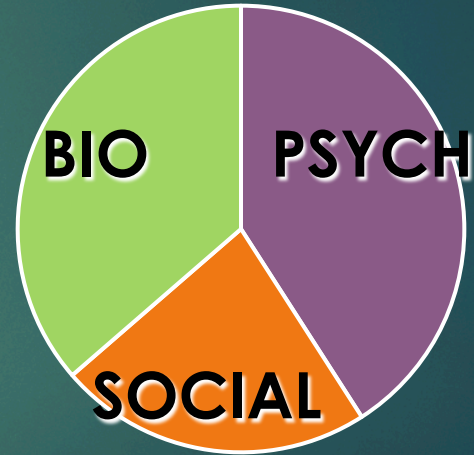
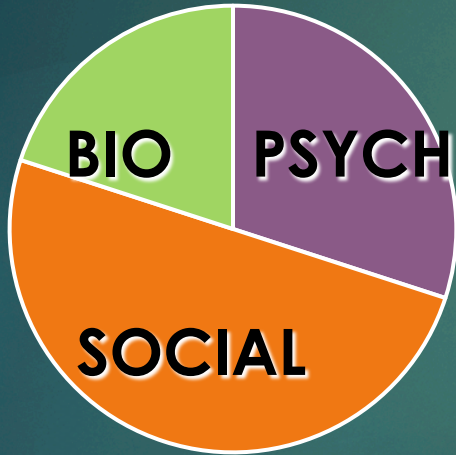
Mood Disorder
Substance Abuse
Trauma History
Impaired
Memory and
Attention
Negative Bias



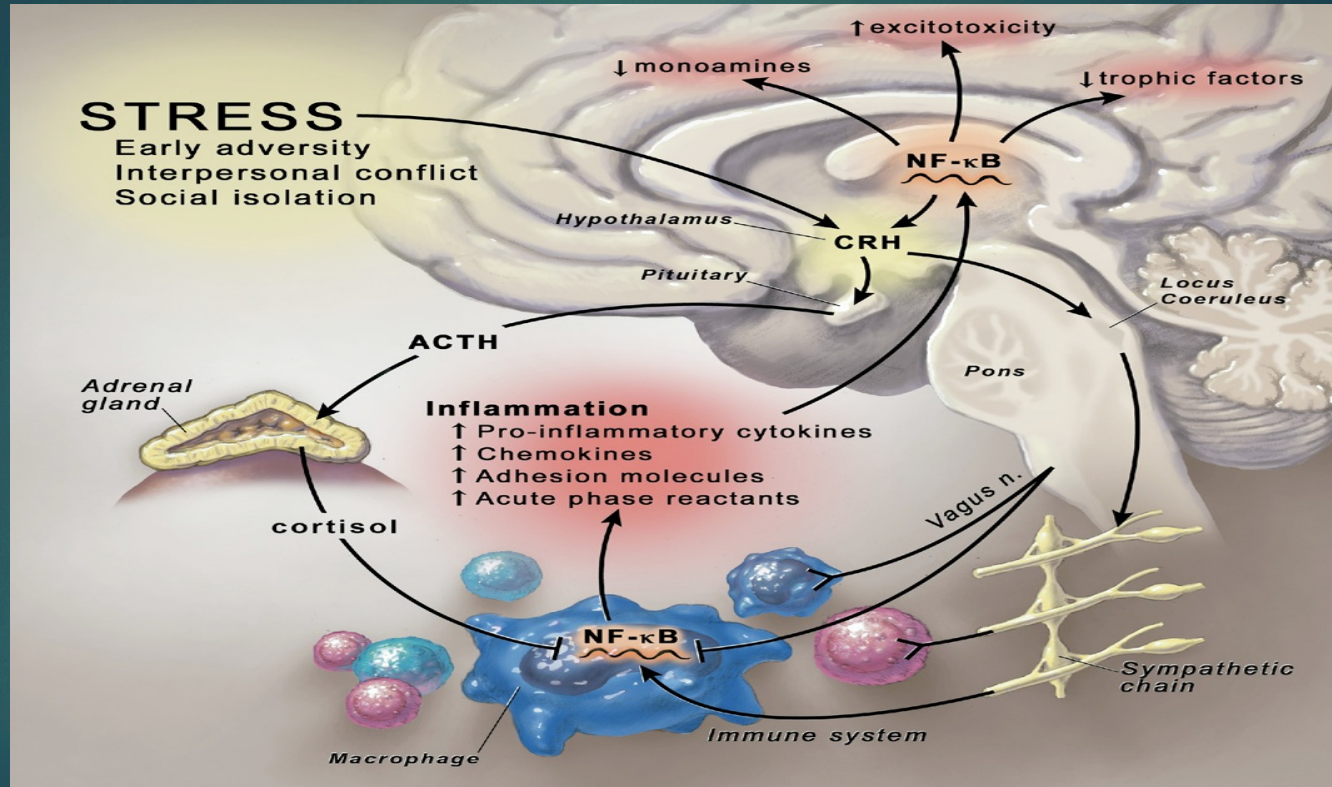
Brain Volume
Brain Activity
Impaired Brain
Chemistry
Inflammation
Genetics



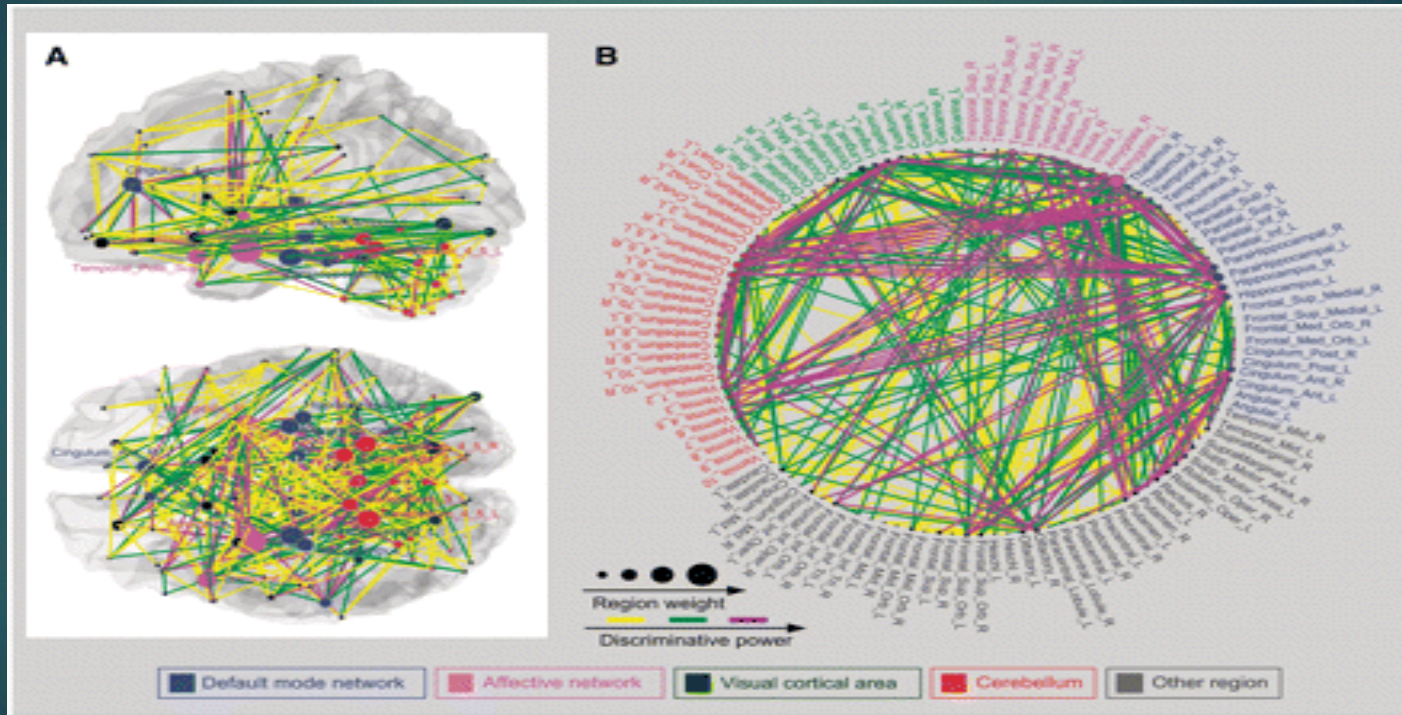
Pathways to Depression



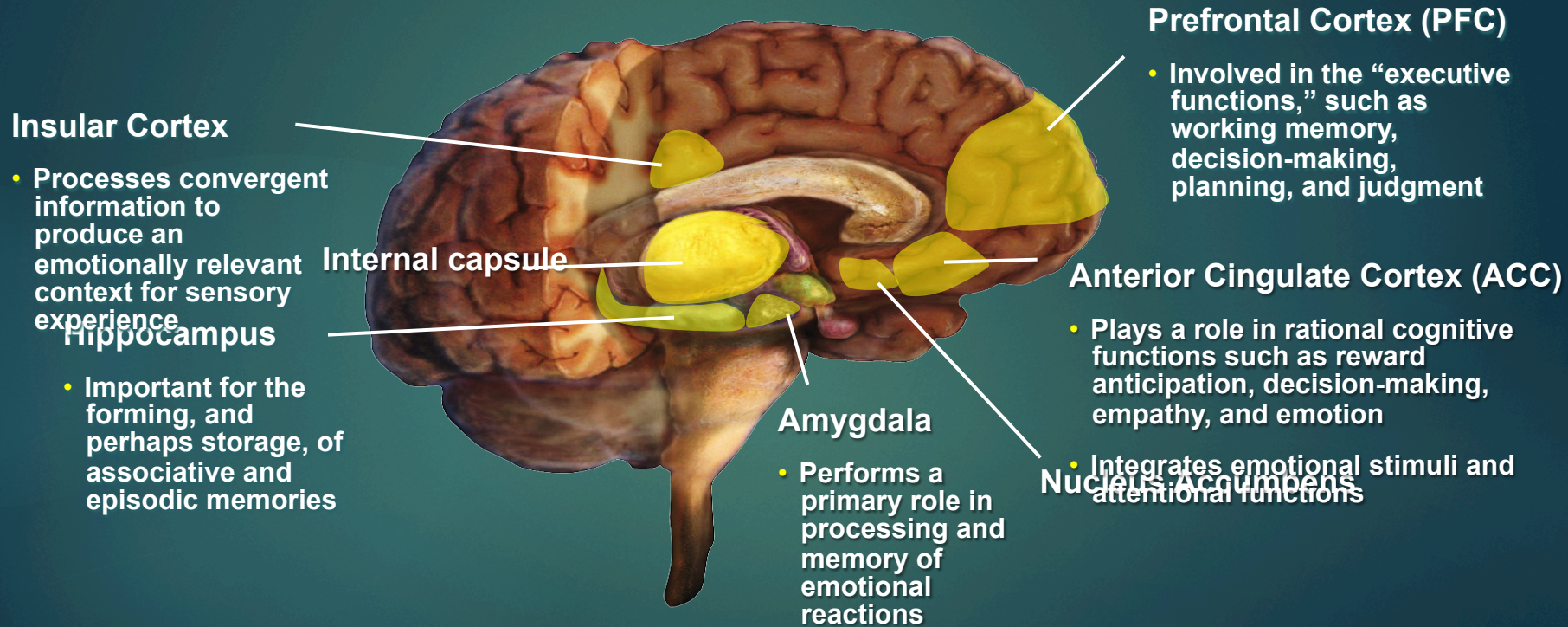
Heterogeneity of Depression Biology



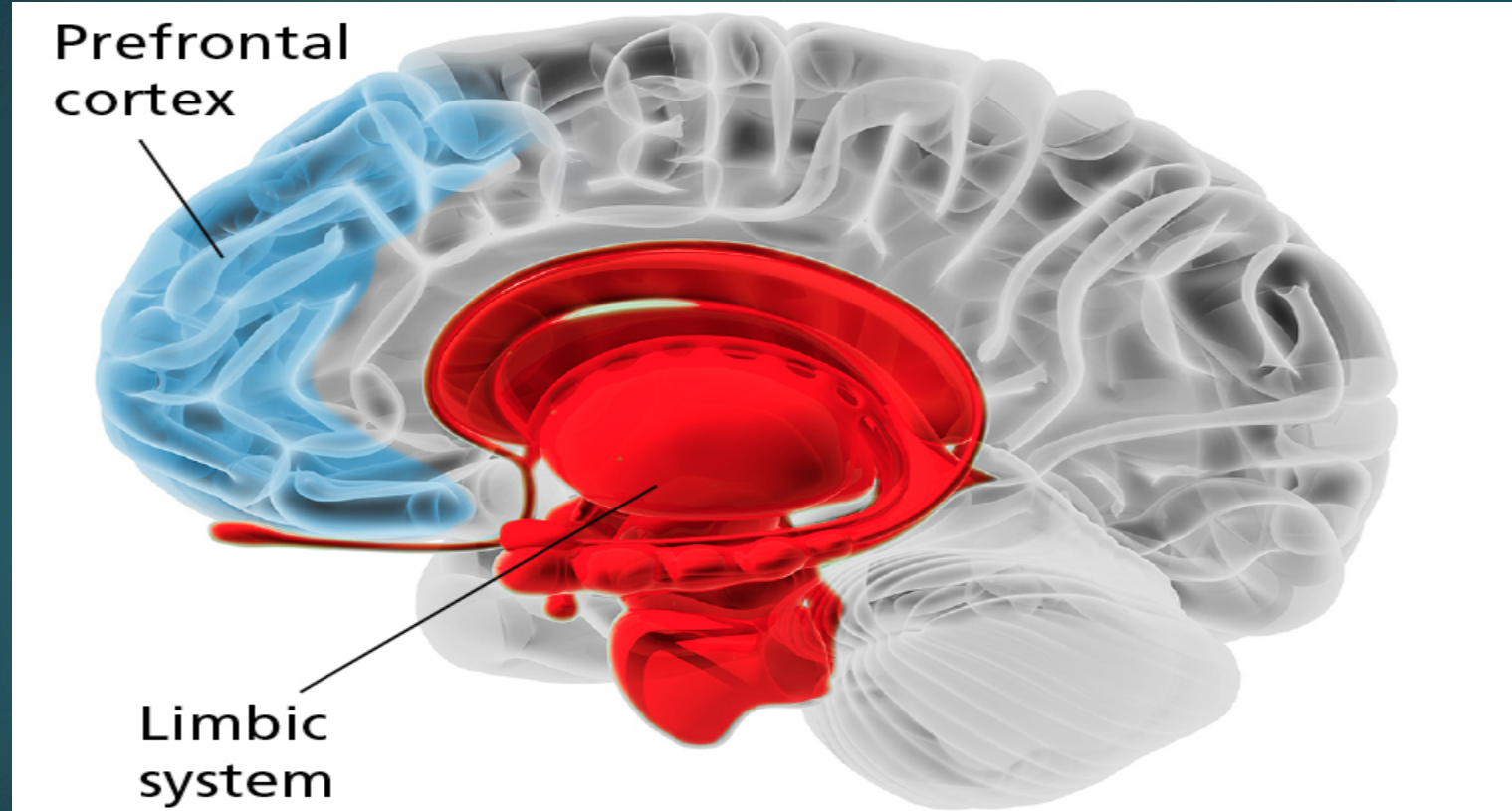
Identifying MDD using Whole-Brain Functional Connectivity



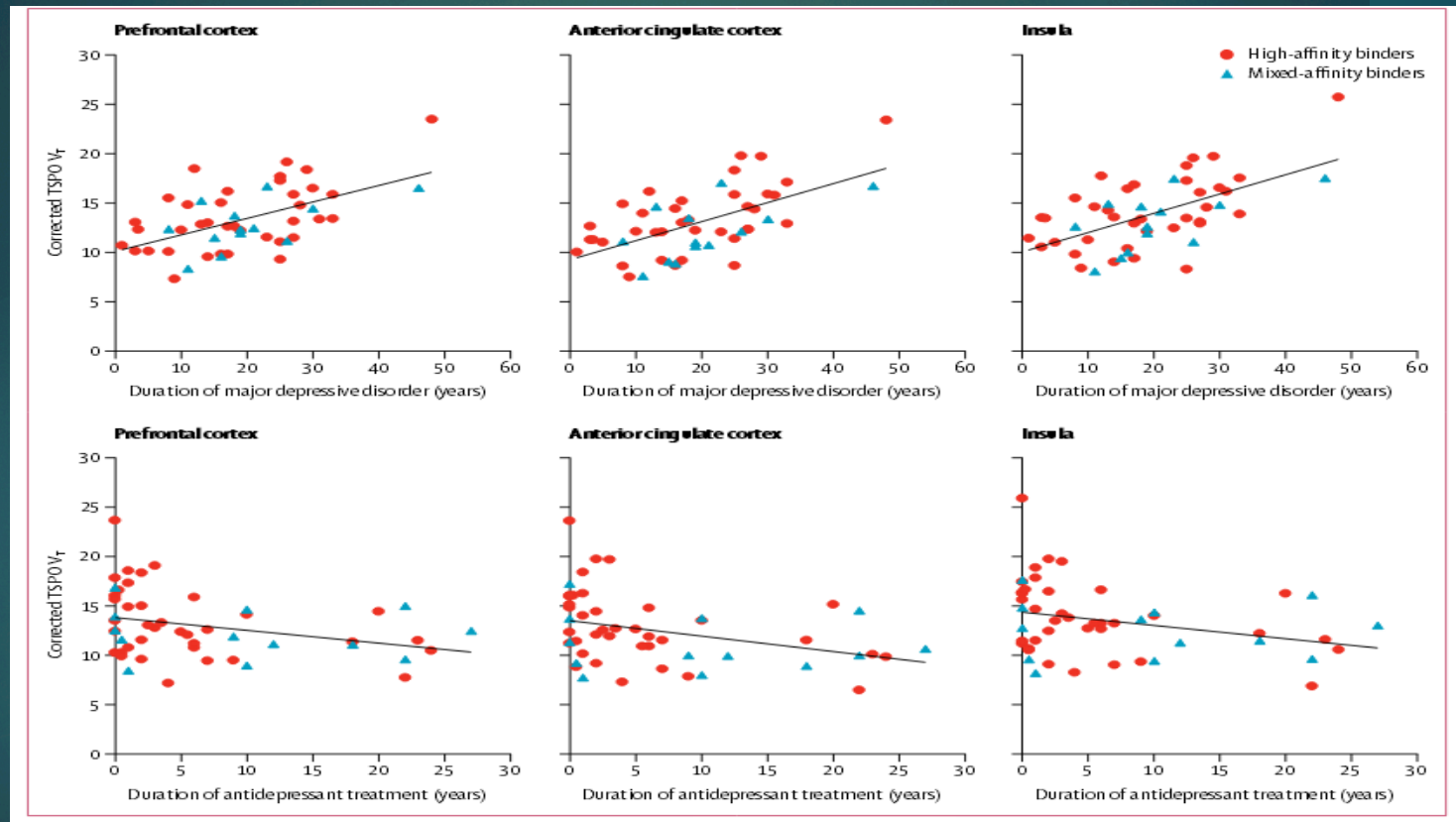
Areas of the brain implicated in MDD



Brain Areas Involved in Suicide Risk

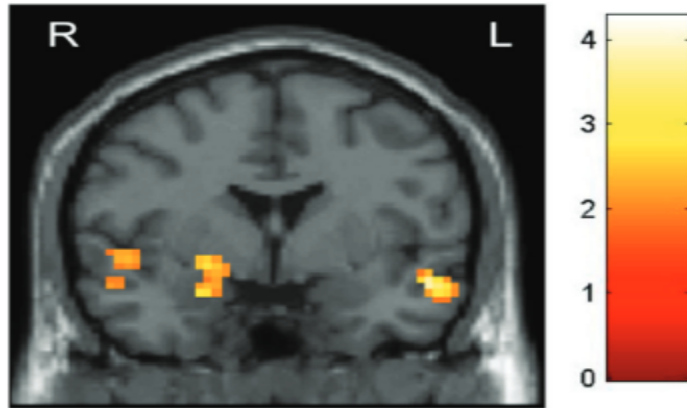


Neuroinflammation in the Brain

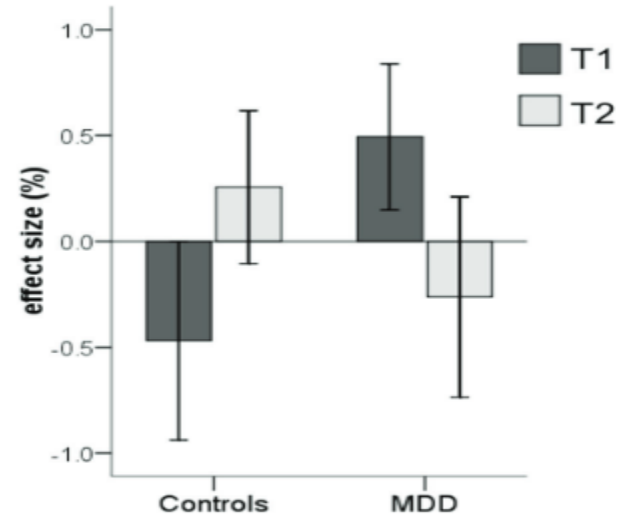


Impact of Successful Escitalopram Treatment in MDD

A: T1 MDD > CON
- anticipation period

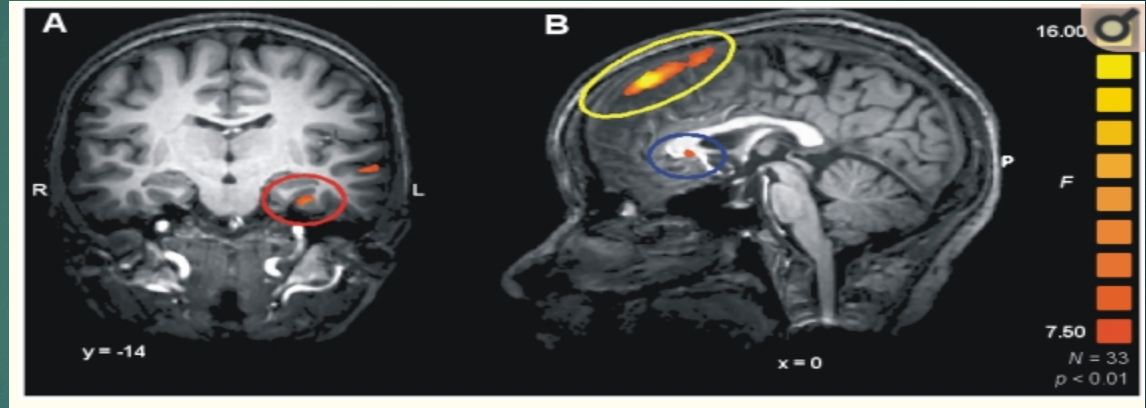


B: anticipation - before and after treatment



Impact of Long-Term Psychotherapy for MDD on Brain Activity

- ▶ 17 individuals with MDD received 15 months of psychodynamic therapy
- ▶ Brain scans during attachment scenes conducted before and after treatment



- A. Amygdala red
- B. Subgenual ACC blue
- C. amPFC yellow

Resilience...?

- ▶ NOT a mythical state of being
- ▶ NOT just born with
- ▶ NOT about personal strength
- ▶ NOT a cure-all for negative emotions
- ▶ NOT avoidance

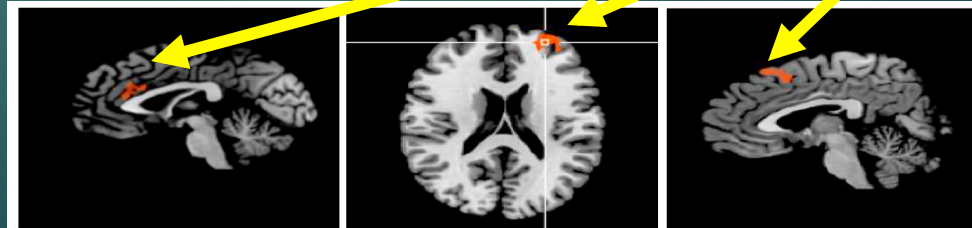
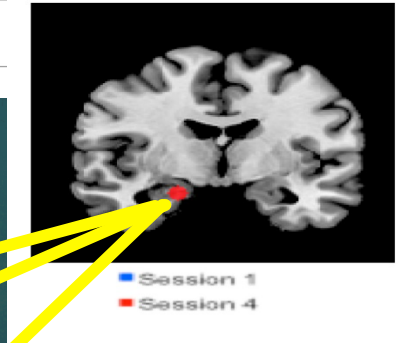
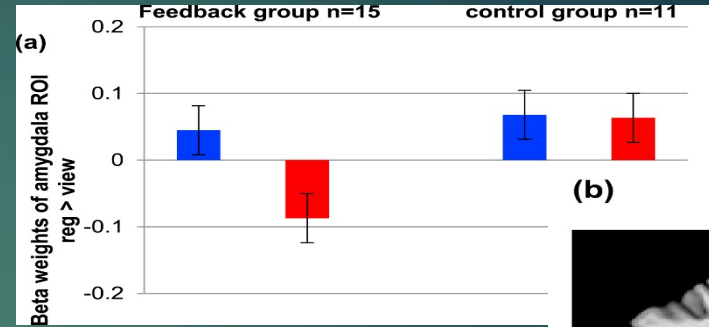
- ▶ IS dynamic
- ▶ IS situation dependent
- ▶ IS multi-dimensional
- ▶ IS creating a toolbox
- ▶ IS unique
- ▶ IS WORK.....hard WORK
- ▶ IS protective

The Brain and Resilience

- ▶ Different coping styles are related to different brain connectivity (avoidant-oriented, problem solving-oriented, social support oriented,
- ▶ Increases ability for brain to respond to rewarding stimuli
- ▶ Enhancing cognitive control networks is protective against relapse of depression

The Brain and Resilience: Neurofeedback

- ▶ 15 participants completed emotion regulation task during real-time neurofeedback of amygdala activity
- ▶ After 4 sessions decreased amygdala activity
- ▶ Increased connections to frontal brain (ACC, dlPFC, dmPFC)



Summary



- ▶ Depression and suicidality affect brain structure and function
- ▶ Successful treatment can ameliorate brain changes
- ▶ Resilience can result in protective brain changes