The Neuroscience of Mindfulness

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Stress response and wellness

• Amygdala is the fight or flight center

• Activation triggers cascade of neural, neuroendocrine, neuroimmune and behavioral responses

• Chronic activation of this circuitry responsible for effects of stress on health outcomes
MBSR increases left-sided cortical activation

Davidson, et al. Alterations in brain and immune function produced by mindfulness meditation
Psychosomatic Medicine 65(4):564-70, 2003 Jul-Aug
Increased immune response

Davidson, et al. Alterations in brain and immune function produced by mindfulness meditation
Psychosomatic Medicine  65(4):564-70, 2003 Jul-Aug
Immune changes correlate with shift in prefrontal activation

Davidson, et al. Alterations in brain and immune function produced by mindfulness meditation
Psychosomatic Medicine 65(4):564-70, 2003 Jul-Aug
Stress reduction correlates with structural changes in the amygdala

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Emotion regulation

- Amygdala is also the fear center
- Input from prefrontal cortex and anterior cingulate modulate emotional responses
- Disorders of emotional regulation exhibit abnormal activation patterns in these regions
Neural Correlates of Dispositional Mindfulness and Affect Labeling
Creswell et al. (2007) Psychosomatic Medicine

Emotion Detection
Gender Detection
Neural deactivation to sadness provocation

Farb et al., 2010
Mindfulness practice leads to increases in regional brain gray matter density

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References


