

Pain in the Brain

Chairperson: Hassan Serhan, PhD
Distinguished Engineering Fellow
Employee of DePuy Spine
a J&J company

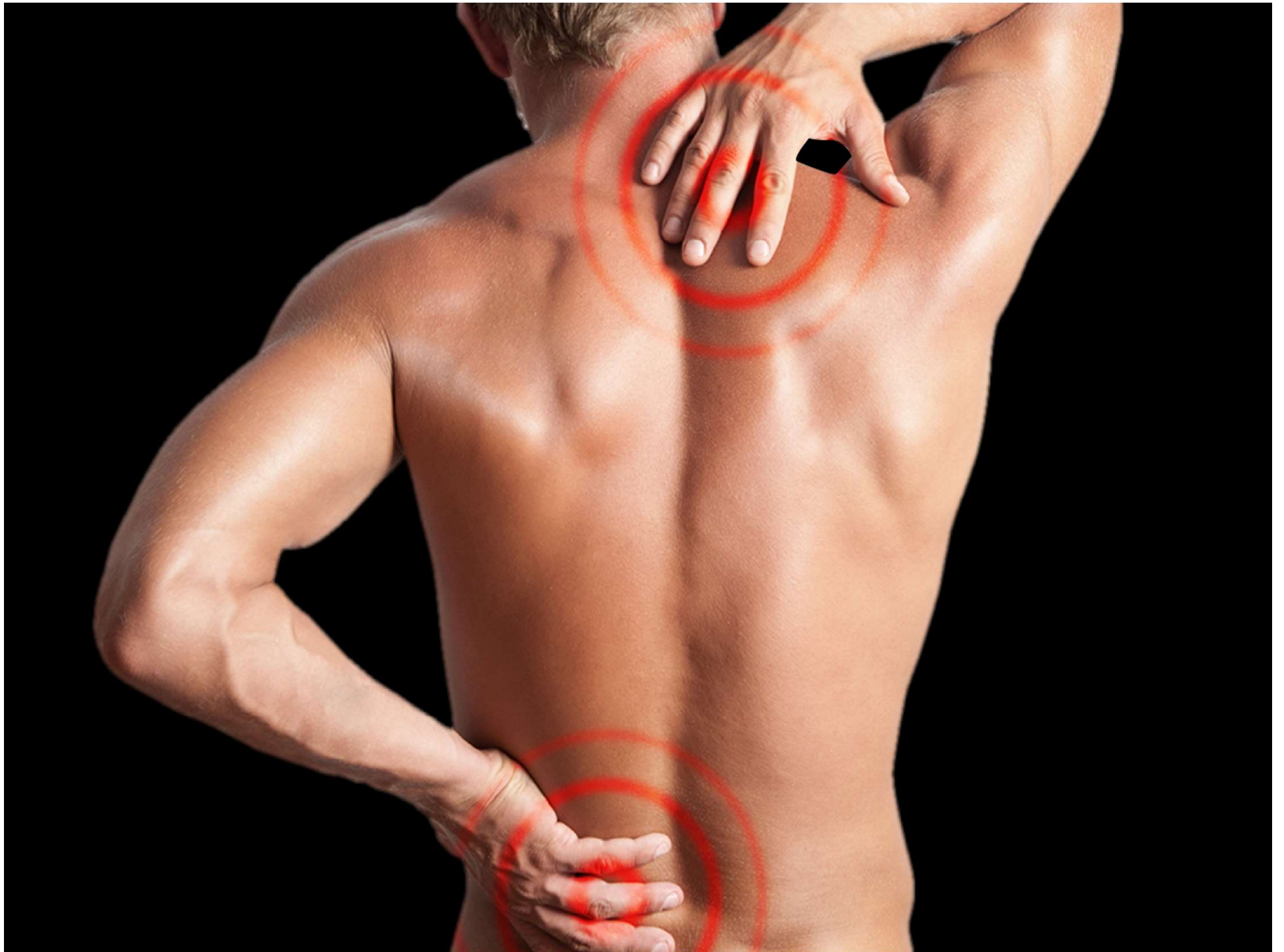
Prestige Adjunct Professor
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Co-Founder & Treasurer
Society for Progress & Innovation for the Near East
www.neareastspine.org

Tuesday, March 26th, 2019
Interactive Workshop Session
12:45 – 1:30 pm

***Work Related Injuries Workshop
March 25th & 26th, 2019***

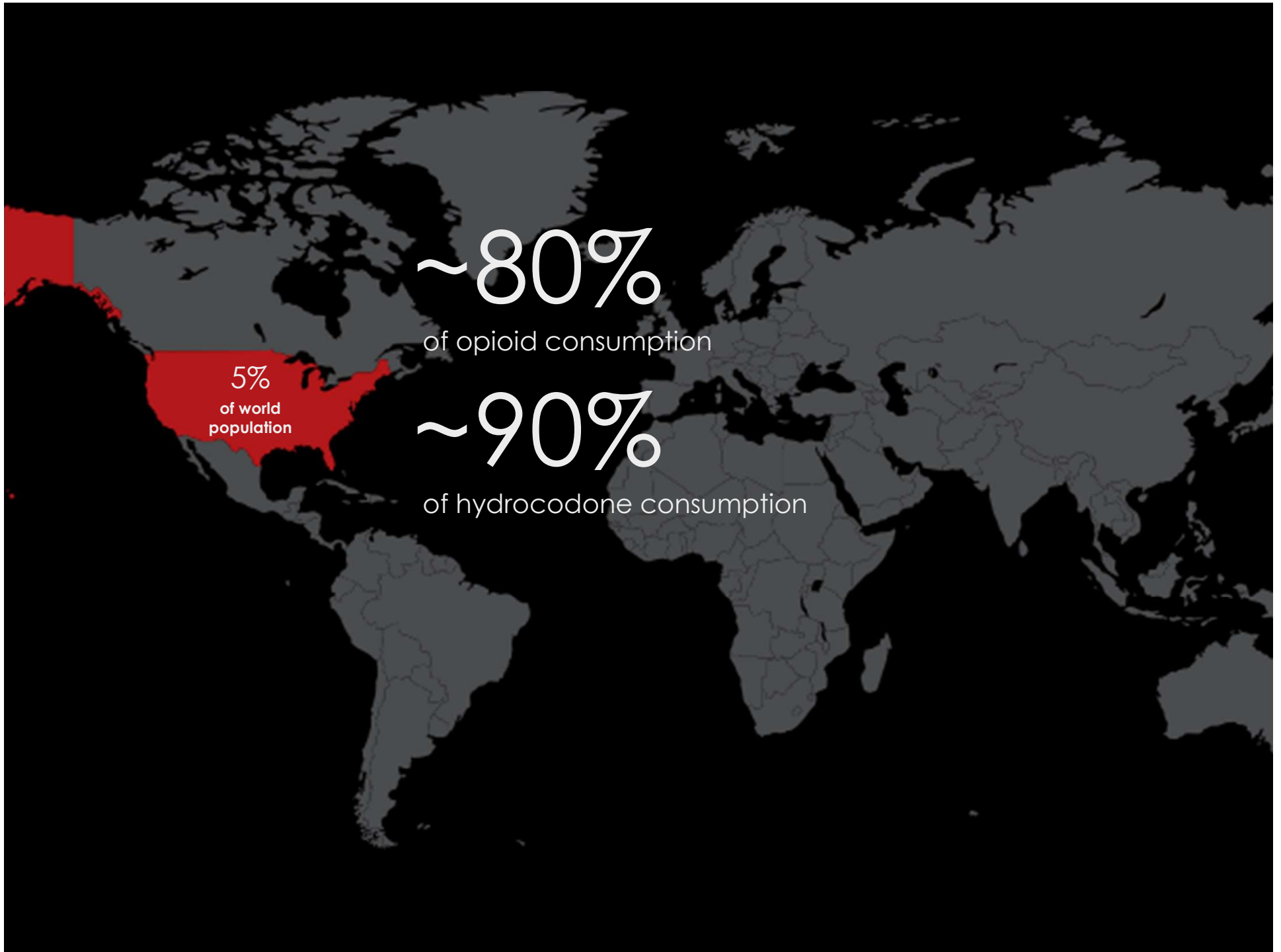
pain



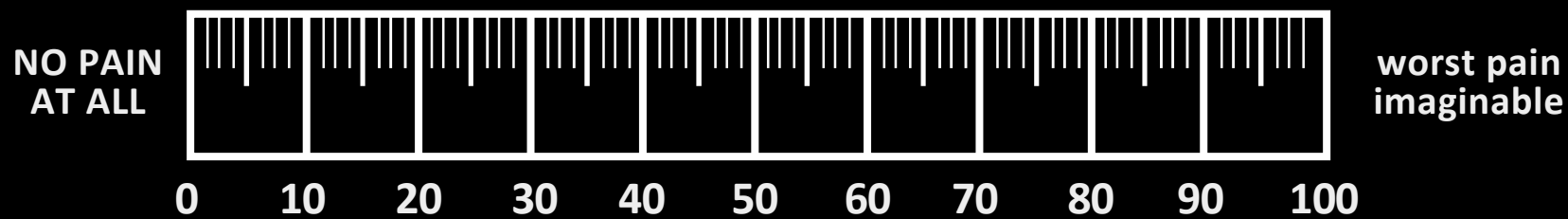
more than

\$200 billion

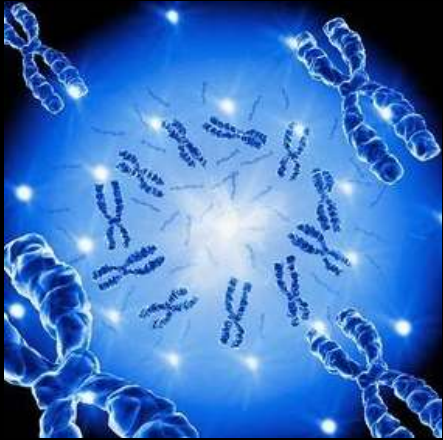
spent on back pain alone



Visual Analog Scale



The experience of pain



genetics




environment



age, race + gender



cognitive factors



“Pain is whatever the experiencing person says it is, existing wherever and whenever he or she says it does.”

—Margo McCaffery



Endogenous Opioids

Enkephalin

Endorphin

Dynorphin

Cortisol

Serotonin

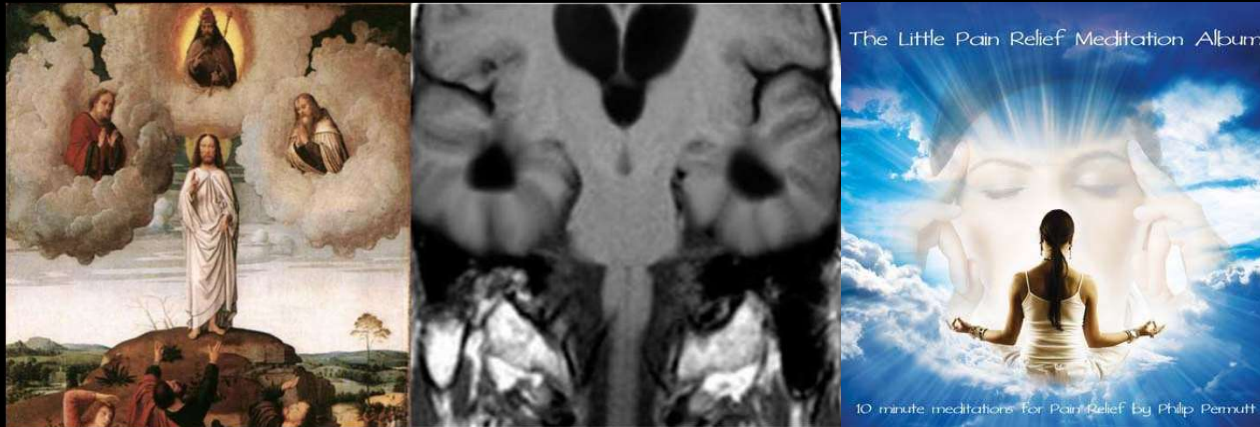
Dopamine

Corticotrophin

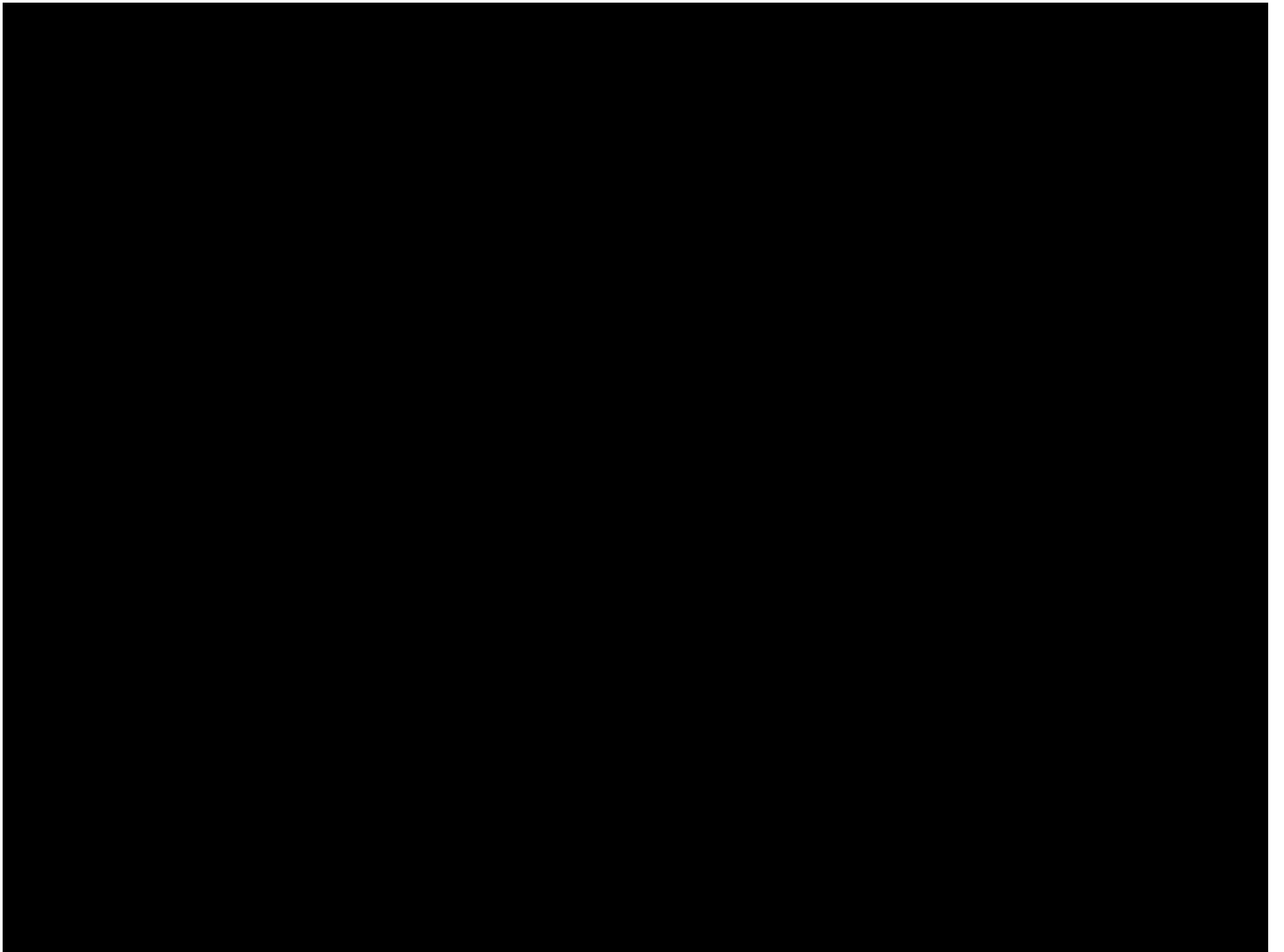




Meditation and Chronic Pain



Analgesia Enhanced by Religion as a Belief System Pain. 2008 Oct 15;139(2):467-76



NEUROINFLAMMATION

ROBERTO FELIZ, M.D

Boston Pain Center

Hyde Park, MA

*Work Related Injuries Workshop
March 25th & 26th, 2019*



NEUROINFLAMMATION

- CRISPER Cas 9 & Chronic Pain & Opioid Receptors
- CRISPER Cas 9 & Neuroinflammation
- GENE EDITING: The next APPLE, next AMAZON.



NEUROINFLAMMATION

- CHRONIC PAIN
 - IS
- NEUROINFLAMMATION



NEUROINFLAMMATION

- AS SUCH:
- CHRONIC PAIN
 - IS
- A CHRONICALLY INFLAMMED BRAIN!!!!!!



NEUROINFLAMMATION

- CHRONIC PAIN

- IS NOT

- THE SUMMATION OF ACUTE PAIN!!!!

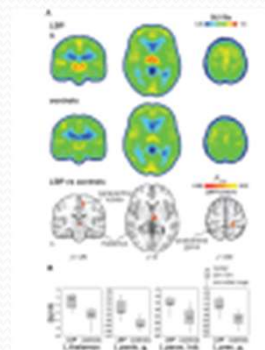
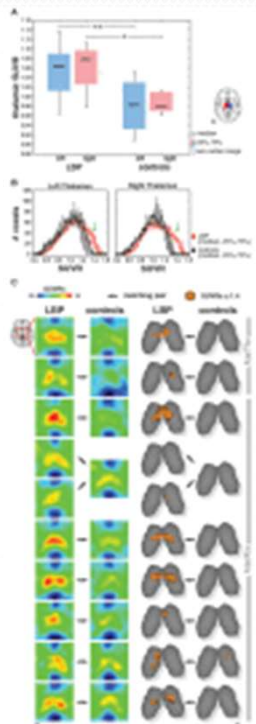
CHRONIC PAIN CAUSES (mal)ADAPTIVE CHANGES
IN THE BRAIN.



NEUROINFLAMMATION

- TO BEGIN TO EFFECTIVELY TREAT CHRONIC PAIN
 - WE NEED BY NECESSITY
 - TO REDUCE MEDIATORS OF NEUROINFLAMMATION
 - OR WE WILL CONTINUE TO FAIL MANAGING CP.

NEUROINFLAMMATION





NEUROINFLAMMATION

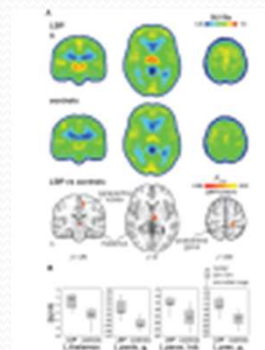
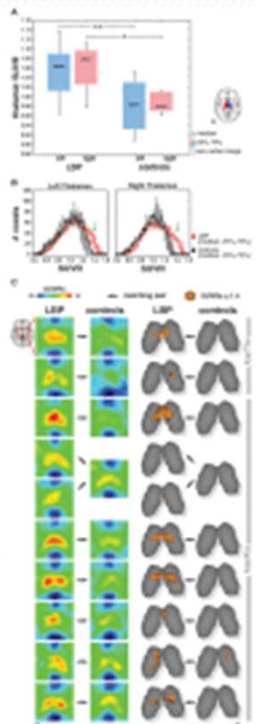
- TO TREAT CHRONIC PAIN:
- MICROGLIA/ASTROGLIA CELLS (Interleukins, TNF)
 - and
- NMDA RECEPTOR!!!!



NEUROINFLAMMATION

- PATIENT: Nick M. Drilled L5 nerve root, CRPS.
- 12/17/2017:
- “I just wanted you to know: The Amantadine suggestion is already helping reduce the L5 CRPS pain, 75%-80% most days (unless I shovel snow—ouch. Thank YOU!!!! I see a light at the end of this tunnel now. Thank you, so much.”
- Nick M.

NEUROINFLAMMATION





NEUROINFLAMMATION

- CHRONIC PAIN “REWIRES YOUR BRAIN”
- CHRONIC PAIN IS A NEURODEGENERATIVE PROCESS SIMILAR TO : TBI, MS, PARKINSON’S, ALZHEIMER’S, ALS.



NEUROINFLAMMATION

- CONTINUED PAIN LEADS TO NMDA RECEPTOR ACTIVATION =
- NEURONAL “WIND-UP,
NEUROPLASTICITY/LEARNED ADAPTATION OF
CNS, CENTRAL SENSITIZATION = CHRONIC PAIN
- KEY: TREAT ACUTE PAIN EARLY BEFORE NMDA
BECOMES OVERSTIMULATED AND WIND-UP.



NEUROINFLAMMATION

- NEUROINFLAMMATION= CHRONIC PAIN
- PAIN & OPIATE INDUCED ACTIVATION OF MICROGLIA & ASTROGLIA CELLS IN THE BRAIN LEADS TO CHRONIC INFLAMMATION IN THE CNS AND MAINTAINING & PERPETUATING THE CHRONIC PAIN.



NEUROINFLAMMATION

- MICROGLIA & ASTROGLIA CELLS ONCE ACTIVATED BY PROLONG PAIN SECRETE PROINFLAMMATORY CYTOKINES/INTERLEUKINS
- PROINFLAMMATORY CYTOKINES THEN RECRUIT WBC/LYMPHOCYTES TO ENTER THE CNS AND MAINTAIN THE CHRONIC INFLAMMATION=NEUROINFLAMMATION=CHRONIC PAIN.



NEUROINFLAMMATION

- MAGIC PILL FOR CP = NOT YET!!!
- AVAILABLE THERAPY FOR NEUROINFLAMMATION:
- MEMANTINE, AMANTADINE, MINOCYCLINE, DEXTROMETHORPHAN, METFORMIN, KETAMINE, LOW DOSE NALTREXONE....TANEZUMAB, AIMOVIG...
- OUR EXPERIENCE AT BOSTON PAIN CENTER. PILOT STUDY.