#CHAIR2020

12TH ANNUAL

CHAIR SUMMIT

Master Class for Neuroscience Professional Development

CME Outfitters

February 27-29, 2020 | The LINQ | Las Vegas, Nevada

Provided by

CME Outfitters

Schizophrenia: Distinguishing the Impact of Biomarkers on Patients and Populations

Steven Siegel, MD, PhD
Professor and Chair
Department of Psychiatry and Behavioral Sciences
Franz Alexander Chair in Psychiatry
Keck School of Medicine
University of Southern California
Los Angeles, CA

Steven Siegel, MD, PhD

Disclosures

- ***Research/Grants:*** Astellas Research Institute of America LLC
- ***Consultant:*** Zynerba Pharmaceuticals, Inc.

Learning Objective 1

Analyze mismatch negativity as a biomarker for reduced functional outcomes in schizophrenia.

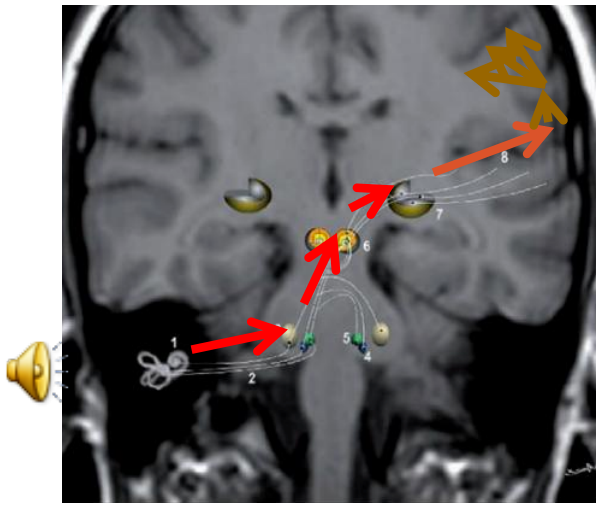
Neurophysiological Deficits in Schizophrenia

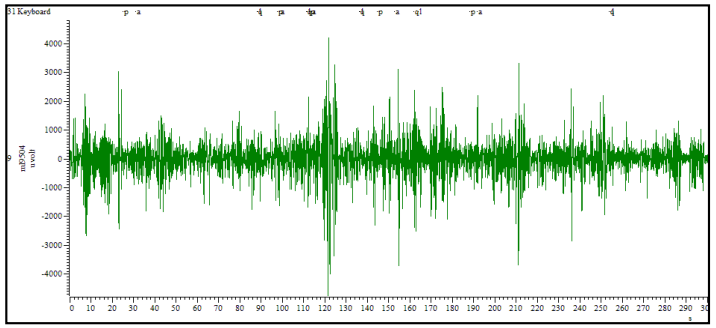
- Patients with schizophrenia exhibit widespread deficits in many domains, including abnormalities in preattentional sensory processing
- Mismatch negativity (MMN) is an event-related potential (ERP) measure that occurs in the absence of directed attention
  - Patients with schizophrenia show a reduction in MMN that is positively associated with impaired cognition and poor functional outcomes

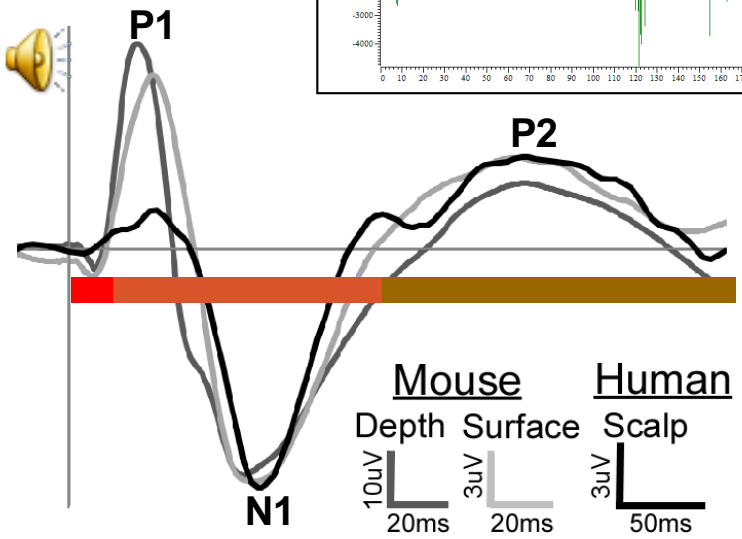
Featherstone RE, et al. *Schizophr Res*. 2018;191;35-42.

Auditory ERPs

- Neural response to external stimuli
- Integrity of sensory processing
  - Amplitude (coherence)
  - Latency (efficiency)







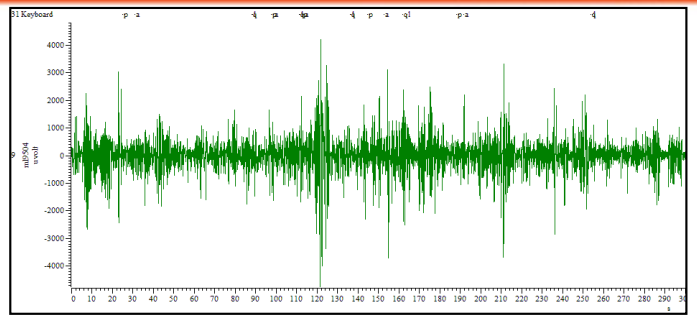
Auditory brainstem responses (ABRs) – subcortical

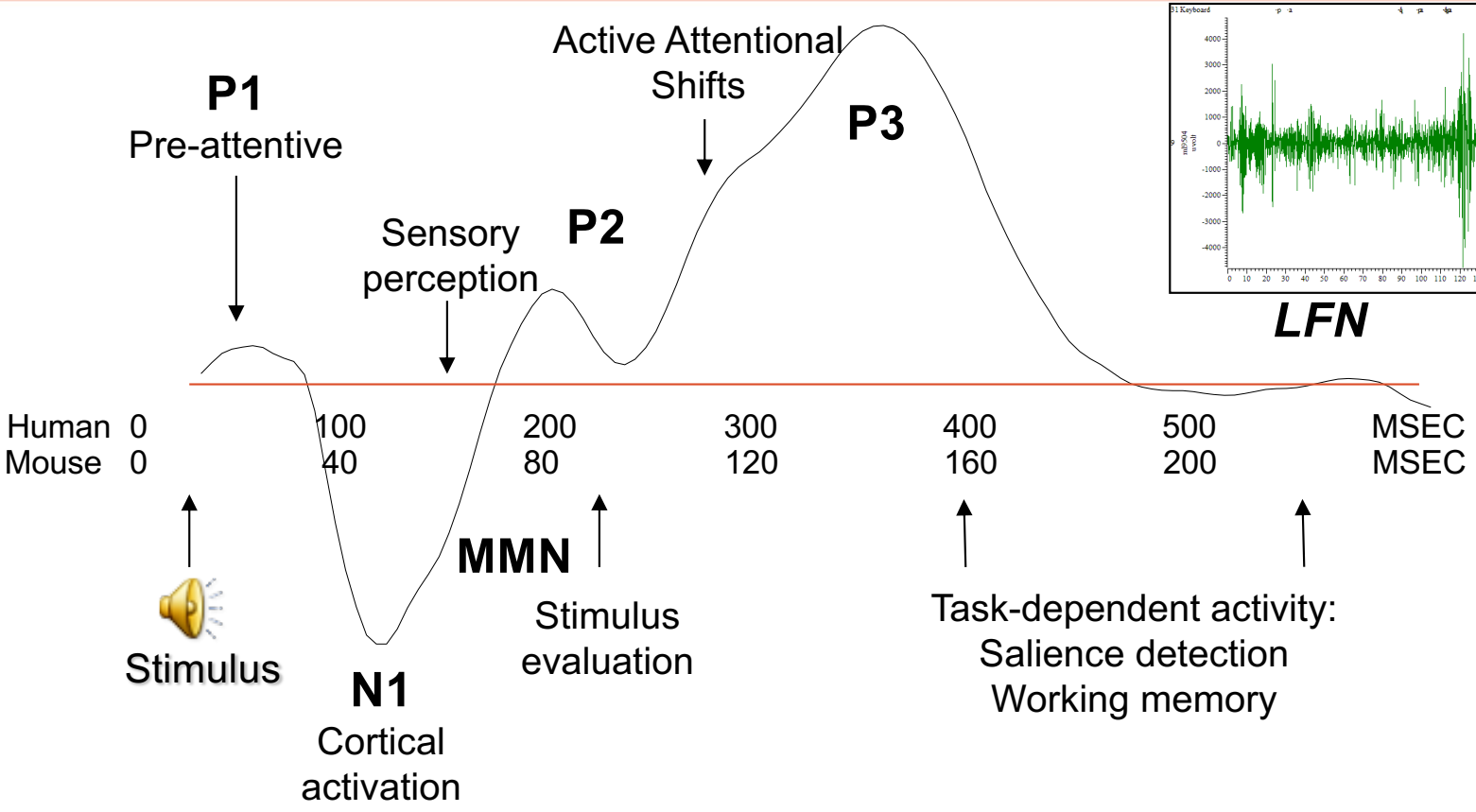
Midlatency (P1/N1) – 1° auditory cortex

Long latency (P2/P3) – association cortices

Bulakbasi N, et al. *Diagn Interv Radiol.* 2007;13(3):109-120; Gandal MJ. *Neuroscience*. 2008;157(1):95-104.

ERPs Assess Integrity of the Sensory Nervous System

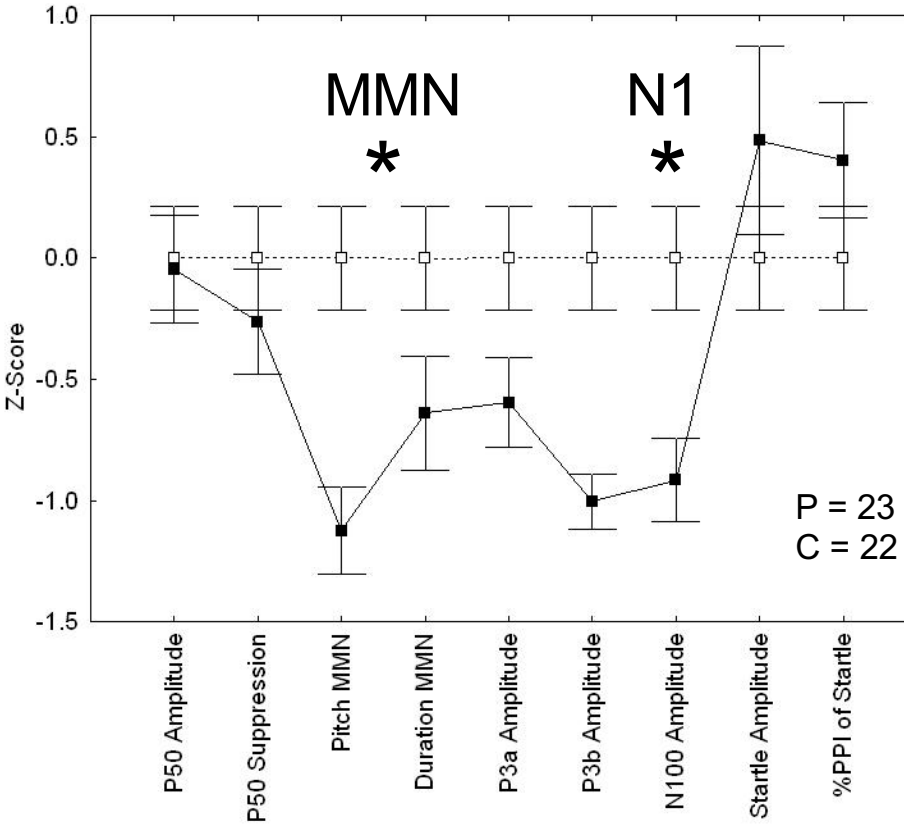




MMN = mismatch negativity; LFN = late frontal negativity; N1 = negative peak in the ERP; P1 = positive peak; P2 = second positive peak; P3 = third positive peak

Sensory EEG Profile in Schizophrenia

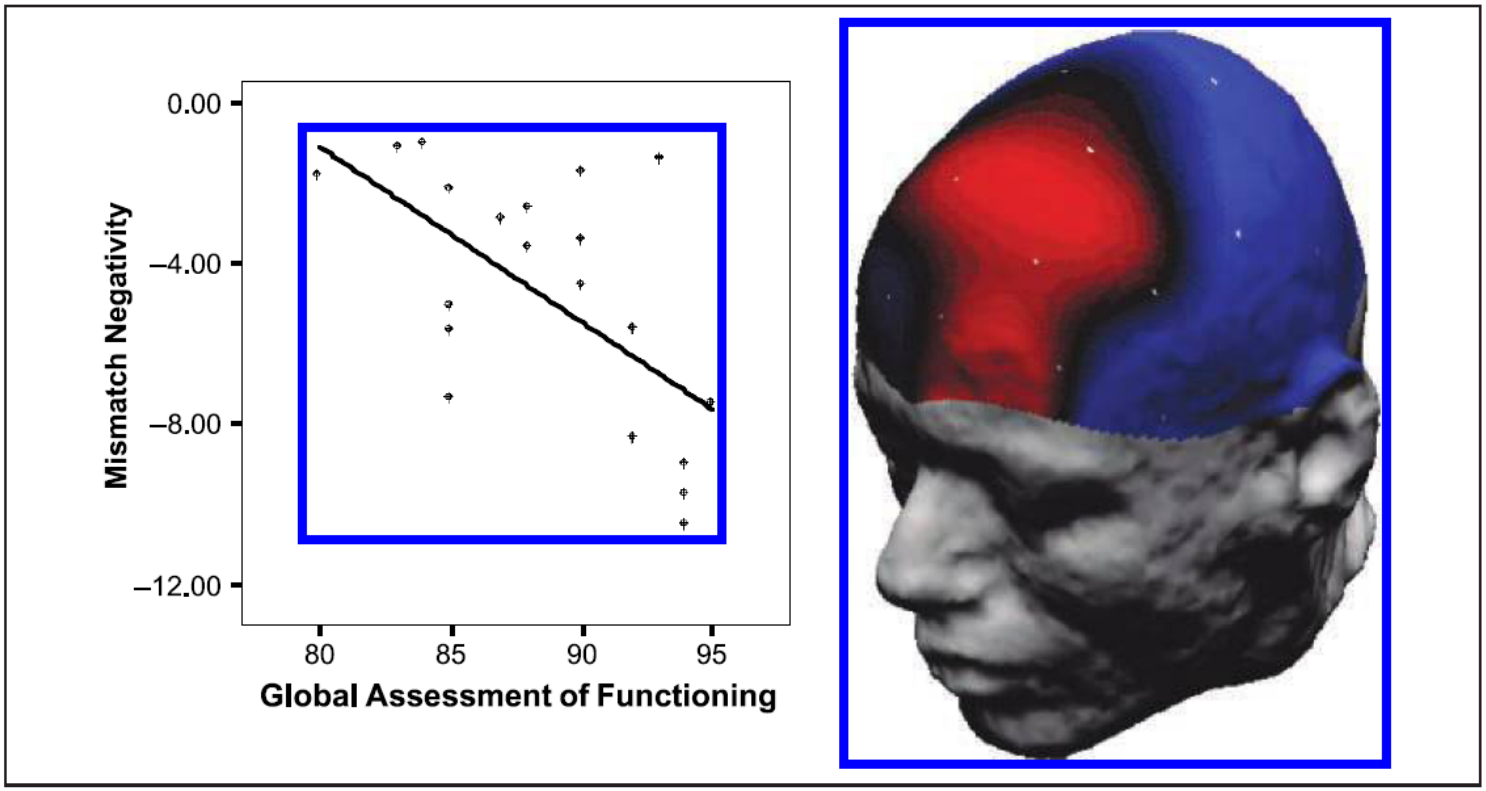
- **N1 and MMN** Deficits associated with negative symptoms and thought disorder
- UCSD findings – MMN associated with global assessment of function in patients and controls



EEG = electroencephalogram; SCZ = schizophrenia; UCSD = University of California San Diego.

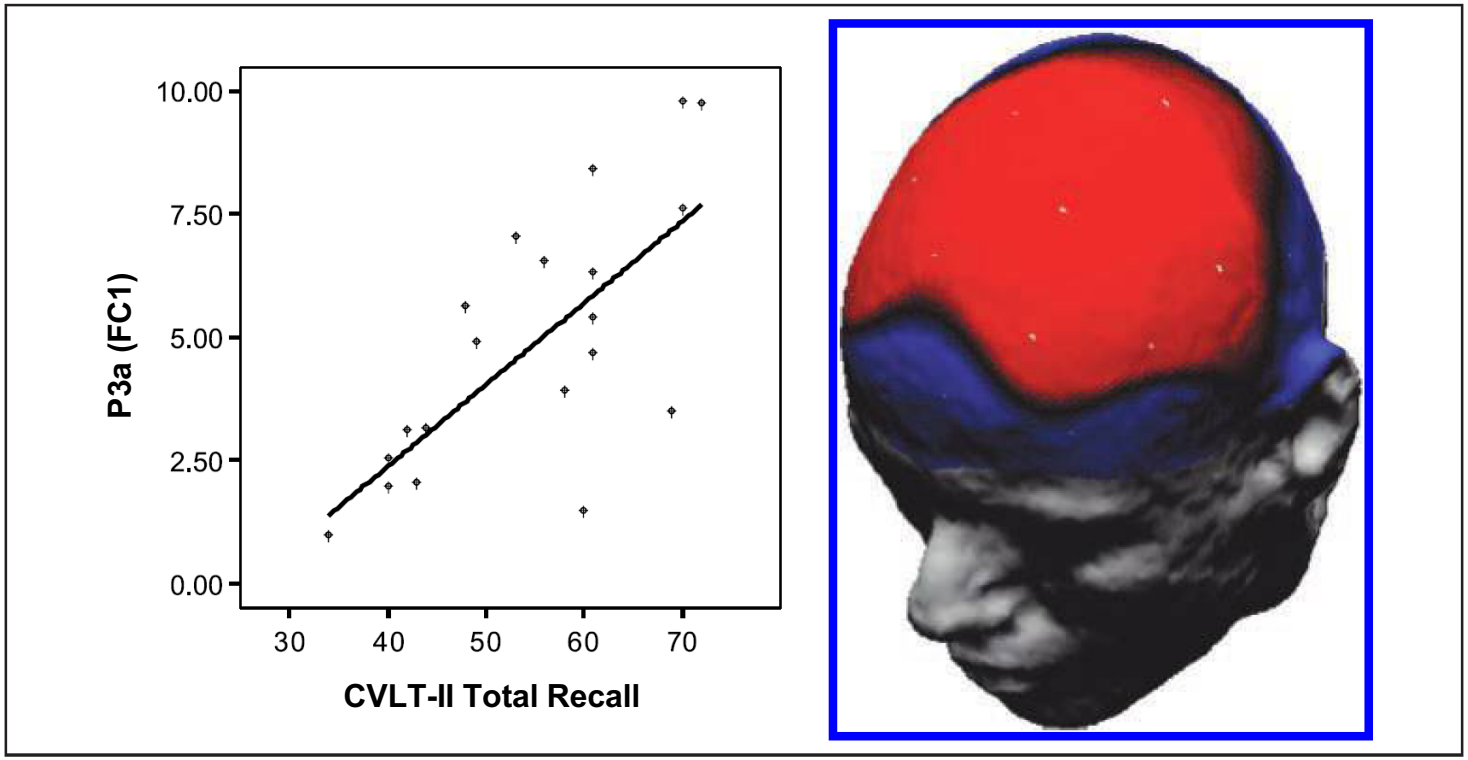
Turetsky BI, et al. *Psychiatry Res.* 2009;165(1-2):27-37; Light GA, et al. *Arch Gen Psychiatry*. 2005;62(2):127-136; Light GA, et al. *J Cogn Neurosci*. 2007;19(10):1624-1632.

MMN Associated with Function



Light GA, et al. *J Cogn Neurosci*. 2007;19(10):1624-1632.

P3a Associated with Cognitive Function



Light GA, et al. *J Cogn Neurosci*. 2007;19(10):1624-1632.

Conclusions

- Neurophysiological measures probe the earliest stages of cognition, such as basic sensory registration, discrimination, and inhibition
- Deficits in these sensory processes may underlie clinical symptoms and downstream deficits in more complex cognitive operations and real-life functioning
- Research indicates that MMN deficits are highly associated with reduced functional status in patients with schizophrenia

SMART Goals

Specific, Measurable, Attainable, Relevant, Timely

- Consider the role of neurophysiological measures such as MMN as potential biomarkers for functional outcomes in patients with schizophrenia.

Questions & Answers

Don’t forget to fill out your evaluations to collect your credit.