Dr. Elana Zion Golumbic

Dr. Zion Golumbic studies how top-down processes, such as attention, shape and change the neural representation of sensory input. Her research focuses on the well-known 'Cocktail Party Problem', which encapsulate the challenge of paying attention to one speaker in a noisy environment. Specifically, she is interested in three aspects of this question:

(a) Understanding how attention modulates the neural representation of attended and unattended speech;

(b) Investigating the variability in attentional control in different populations and studying parameters enhancing and reducing the capacity for selective attention across individuals;

(c) Developing training regimes for improving the capacity for selective attention using neuro-feedback techniques.

In her research, Dr. Zion Golumbic utilizes a range of techniques for recording electric and magnetic signals from the human brain. These methods provide excellent means for investigating the complex neural dynamics involved in encoding and processing speech and other naturalistic stimuli. Gaining insight into these neural mechanisms will significantly improve our understanding of the neural basis of selective attention, which poses a constant challenge in everyday environments. Furthermore, it provides a prime example for the flexibility and dynamic nature of the brain, which actively shapes its own responses according to task requirements and environmental demands.

Positions

Current:	Senior Lecturer in the Gonda Brain Research Center, Bar Ilan University, Israel
2009-2013:	Postdoctroal Fellow, Columbia University, New York

Selected Grants and Awards

2010	National Research in Science Award, NIH
2009	The Berger award for an Excellent PhD dissertation, The Hebrew Univerisity

Selected Publications

1. **Zion Golumbic, E.**, Ding, N., Bickel, S., Lakatos, P., Schevon, C.E., McKahn, G., Mehta, A. Poeppel, D. Schroeder, S. (2013) Mechanisms underlying Selective Neuronal Tracking of Attended Speech at a Cocktail Party. *Neuron*; *77*(5): 980-91
2. **Zion Golumbic, E.**, Cogan, G.B., Schroeder, C.E., Poeppel, D. (2013) Visual Input Enhances Selective Speech Envelope Tracking in Auditory Cortex at a 'Cocktail Party'. *Journal of Neuroscience*, 33(4): 1417-1426.
3. **Zion Golumbic, E.**, Poeppel, D., Schroeder, C.E. (2012) Temporal context in speech processing and attentional stream selection: A behavioral and neural perspective. *Brain and Language* ***Special issue***, 122(3):151-61
4. **Zion-Golumbic, E**., Kutas, M., Bentin, S. (2010) Neural dynamics associated with semantic and episodic memory for faces: evidence from multiple frequency bands. *Journal of Cognitive Neuroscience*, 22(2):263-77.
5. **Zion-Golumbic, E.**, & Bentin S. (2007) Dissociated neural mechanisms for face detection and configural encoding: Evidence from N170 and induced gamma-band oscillation effects, *Cerebral Cortex*, 17(8):1741-9.