The Sensation & Perception research labs at the Hebrew University focus on how our brain generates a representation of the world around us, combining incoming perceptual information with memory to enable us to act.

Imagine yourself driving along on a sunny day with open car windows. The birds are singing, you feel the wind in your hair and you hear children playing somewhere ahead. Something red bounces onto the street. Instinctively, you hit the brake, and the child running onto the street after her ball is safe.

Human beings and animals can react to input coming from the environment in split seconds. This amazing ability relies entirely on the brain and the intricate interplay between sensory brain areas responsible for abilities such as hearing, seeing, or feeling.

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Scientists at ELSC are answering questions such as how visual input is integrated with motor planning to enable us to grasp an object, what happens in our brain when we look at others performing actions, and why complex auditory signals may be easier to analyze for our brain.

One avenue of fascinating research at the Hebrew University investigates the brain of visually impaired individuals, showing how brain areas that are normally used for sight are rewired to enable better memory in the blind. This type of brain reorganization, where brain areas take on new functions, shows the great plasticity of the human brain, with important implications for the possibility of neuronal regeneration after brain damage. Additional research has shown that people can learn to recognize shapes by means of especially designed soundscapes, activating shape recognition areas in the brain that are usually only activated when we perceive a shape visually. This research shows that it is essentially possible to see even without sight!
These investigations may make it possible to greatly improve the quality of life of millions of people, and call for a substantial investment in advanced research tools enabling the study of sensory processing at the levels of single neurons, neuronal circuits, whole brain areas, and the complex interactions between different areas of the brain, which ultimately enable us to act within our environment.

Activating the 'mind's eye' - sounds, instead of eyesight can be alternative vision
Common wisdom has it that if the visual cortex in the brain is deprived of visual information in early infancy, it may never develop properly its functional specialization, making sight restoration later in life almost impossible.

Experience-dependent plasticity of mature adult-born neurons
A new research shows plasticity in adult neurogenesis.

It's the thought that counts
A neurobiology expert takes a look at sound and the science of music at next week's Cinema and Brain Week at the cinematheque.

Tapping onto the visual cortex of the congenitally blind by substituting vision with sounds
Scientists at the Hebrew University have tapped onto the visual cortex of the congenitally blind by using sensory substitution, a way to convert visual information to sounds or touch

J. Post: Scientists: Sound can activate 'sight' for blind
Brain scientists tap into visual cortex of people suffering from congenital blindness - making it possible for them to 'see.'

Multisensory Integration of Natural Odors and Sounds in the Auditory Cortex
A new study reveals a connection between odor and auditory sensory information in mothers.
Hebrew U device uses sonar to help the blind navigate
The "virtual cane" incorporates several sensors that estimate the distance between the user and the object it is pointed at.
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Brain doesn't need vision at all in order to "read" material, report Hebrew University, French researchers
The portion of the brain responsible for visual reading doesn't require vision at all, according to a new study by researchers from the Hebrew University of Jerusalem and France.
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A New Book: Auditory Neuroscience
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Two-photon microscopy reveals new insights into the auditory cortex
Scientists at the Hebrew University have succeeded in using an advanced method of functional imaging, called two-photon calcium imaging, to monitor the activity of dozens of neurons in the auditory cortex of living mice simultaneously.
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