

THE
Flexner
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MICHAEL M. MERZENICH, PH.D.

LIVING WITH A PLASTIC BRAIN

SEPTEMBER 26, 2013
4:00 P.M.
208 LIGHT HALL

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Flexner
DISCOVERY
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Upcoming Discovery Lecture:

CARL W. ZIMMER
Yale University

October 3, 2013
208 Light Hall / 4:00 P.M.

VANDERBILT  UNIVERSITY
MEDICAL CENTER

LIVING WITH A PLASTIC BRAIN

Over the past several decades, neuroscientists have redefined the rules that govern the acquisition and refinement of behavioral ability in neurological terms. Importantly, they have revealed the fundamental contribution of plasticity processes to both the advance and the regression of human abilities across our human lifespans, through the operation of neurological processes that are, by their nature, broadly reversible. This science has also led to the development of a new class of therapeutics that directly target both behavioral and neurological re-normalization achieved via computer-controlled training, now being applied in a growing number of struggling child and adult populations. After a brief review of the premises underlying this new interpretation of the nature of our humanity as a product of our adaptive neurology, we shall consider the contributions of plasticity to the expressions of developmental and acquired neurological illness—then briefly discuss how we are harnessing these same natural processes to systematically drive brains in patient populations in improving/corrective directions.



MICHAEL M. MERZENICH, PH.D.

**PROFESSOR OF OTOLARYNGOLOGY AT UCSF
SCHOOL OF MEDICINE**

MEMBER, NATIONAL ACADEMY OF SCIENCES

MEMBER, INSTITUTE OF MEDICINE

A native of Lebanon, Oregon, Merzenich received his undergraduate education at the University of Portland and was trained as a neuroscientist at the Johns Hopkins University and the University of Wisconsin before joining the UCSF faculty. At UCSF, as the Francis A. Sooy Professor, he was the long-time Director of the Coleman Laboratory. Research interests have included the functional organization of the somatosensory and auditory nervous systems; the neurological bases of—and rules governing—learning-induced cortical plasticity; and the neurological origins of and remediation of developmental and acquired impairments in language, reading, memory, attention, cognitive control, and movement. His research team has extensively modeled changes induced in the brain a) following brain injury and stroke; b) resulting from distorted experiential history leading to acquired impairments, psychotic illness and addiction; and c) contributing to pathological neurological regression in aging. All were studied as platforms for developing brain plasticity-based medical therapeutics to treat those conditions in human populations. Dr. Merzenich led a research team that created a widely commercially applied cochlear implant (Advanced Bionics' Symbion). In 1996, he co-founded Scientific Learning, a company dedicated to delivering remedial therapies to address language, reading, attention, and cognitive impairments in school age children. In 2002, he co-founded Posit Science, which produces and delivers computer-delivered therapies applied to help aging, psychiatrically-impaired, and brain-injured populations. In 2009, he founded the Brain Plasticity Institute, a research company focused on developing new treatment strategies for children and adults with severe neurological impairments. Current targets include schizophrenia prevention/treatment, major depressive disorder, bipolar disorder, resilience training to delay Alzheimers and Parkinsons onset, "chemobrain", "pumpbrain", brain infections (HIV/AIDS, Lyme, malaria), autistic spectrum disorders, ADHD, conduct disorders, substance abuse disorders, hemispatial neglect syndrome, aphasias, and acquired movement disorders.
