



**NAMHC Workgroup:
“Setting Priorities for the
Basic Sciences of Mental
Health”**

Final Report to NAMHC – May 14, 2004



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH



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The Context

- The years of exceptional budget growth are over
 - Expecting very small increases over the coming years
- Commitment base is quite high
 - Reduces success rates
 - Limits opportunities for new initiatives

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Fundamental task:

- Help NIMH set priorities for the basic behavioral and neurosciences

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Domains of Basic Science in Mental Health

- Molecular, Cellular, and Genomic Neuroscience
- Behavioral Neuroscience
- Basic Behavioral Science

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Organizations Contacted

● American College of Neuropsychopharmacology (ACNP)	● Consortium of Social Science Associations
● American Neuroendocrinology Society	● Federation of Behavioral, Psychological, and Cognitive Sciences
● American Psychological Association	● Genetics Society of America
● American Psychological Society	● International Behavioral Neuroscience Society
● American Society for Pharmacology and Experimental Therapeutics (ASPET)	● International Brain Research Organization
● Cognitive Development Society	● International Neural Network Society
● Cognitive Neuroscience Society	● International Society for Developmental Neuroscience
● Cognitive Science Society	● International Society for Developmental Psychobiology
● Comparative Cognition Society	● International Society for Infant Studies

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Organizations Contacted

● International Society for Research in Emotion	● Society for Neuroscience
● International Society of Developmental Psychobiology	● Society for Personality and Social Psychology
● International Society for Psychoneuroendocrinology (ISPNE)	● Society for Psychophysiological Research
● Linguistic Society of America	● Society for Research in Child Development
● Psychonomic Society	● Society for Research on Biological Rhythms
● Sleep Research Society	
● Society for Behavioral Neuroendocrinology	
● Society for Developmental Biology	
● Society for Experimental Social Psychology	

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Members of the Workgroup

- Thomas Carew (Irvine)
- Jeffrey Conn (Vanderbilt)
- Richard Davidson (Wisconsin)
- Michael Davis (Emory)
- Geoffrey Duyk (Exelixis, Inc.)
- Megan Gunnar (Minn.)**
- Myron Hofer (Columbia)
- Richard Haganir (Johns Hopkins)
- James Jackson (Mich.)
- Alan Leshner (AAAS)
- Steven Maier (Colorado)
- Athina Markou (Scripps)
- Helen Mayberg (Emory)
- Margaret McCarthy (Maryland)
- Susan McConnell (Stanford)
- James McNulty (NAMI)**
- Eric Nestler (Univ. Tex. SW Med. School)**
- Hal Pashler (UCSD)
- Donald Pfaff (Rockefeller)
- Peter Salovey (Yale)**
- Paul Sawchenko (Salk)
- Larry Squire (UCSD)**
- Helen Tager-Flusberg (Boston Univ.)

7 ** Council members

The Task

- Review the existing NIMH basic science portfolio
 - Highlight greatest opportunities
 - Identify redundancies
 - Identify areas better served by other institutes
- Scan the broader basic behavioral and neurosciences
 - Identify greatest opportunities
 - Suggest approaches to filling the gaps

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Criteria:

- Relevance – NIMH mission
- Traction – current opportunities
- Innovation – what is new

Relevance + Traction + Innovation = IMPACT

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Process

- Full group meeting – January 13
 - Charge
 - Formed two subgroups
 - Molecular and cellular – Eric Nestler, Chair
 - Behavioral and behavioral neuroscience – Richard Davidson, Chair
- Subgroups reviewed portfolios, submitted suggestions, met – February 3, March 3
- Full group meeting – March 31
 - Formalized recommendations, discussed report
- Email review
- Present final recommendations to NAMHC May 14

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The report

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Organization of the report

- Over-arching principles
- Cross-cutting themes
- Areas for increased emphasis
- New and improved research tools
- Areas ready for refocus
- Areas better served by other institutes

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Core conclusions:

- Basic behavioral science and neuroscience are critical to achieving NIMH mission
 - Mission should drive portfolio
 - Mustn't overplan – need a wide ranging portfolio
- Current portfolio is quite strong and serves the mission well
 - All things can be improved!

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Some over-arching principles

- Basic research that integrates or translates across levels of analysis should be given high priority
- Research and training that are interdisciplinary in nature should be more heavily emphasized
- More work needs to be done on the effects of environments on behavior that includes studying both the molecular and integrative (biological) systems levels

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Areas for increased emphasis

- Emotion
 - Neurobiology of emotion, mood and motivation
 - Interaction of emotion and cognition

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Areas for increased emphasis

- Development
 - Periods of rapid neurobiological development in humans
 - How neural activity and gene-environment interactions regulate late prenatal development
 - Intersection of social and cognitive functioning with neurobiological development

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Areas for increased emphasis

- Social interactions
 - "Mental illness relevant" social behaviors and processes
 - Integration of social processes/behaviors with brain functioning

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Areas for increased emphasis

- Neural circuitry
 - Take advantage of cellular imaging tools
 - Psychotropic drug action and complex behaviors
 - Synaptic mechanisms
 - Neuronal replacement

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Areas for increased emphasis

- Sex and gender differences and mechanisms

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Areas for increased emphasis

- Intracellular signal integration
 - How multiple signal transduction pathways interact to produce integrated cellular responses
 - Use of non-mammalian models to delineate intracellular pathways relevant to mammals

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New and improved research tools

- More appropriate animal models
 - Mouse behavior
 - Genetic tools for the rat
 - Non-human primate research
 - Non-mammalian model organisms

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New and improved research tools

- Ligand development
- Computational models
- Standardization of behavioral tools
- Neuroimaging
 - Emphasis on "what is being measured" and its relevance

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Areas ready for refocus

- Aspects of learning and memory
 - Integrate across levels of analysis
 - Integrate across domains within cognitive area

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Areas ready for refocus

- Sleep
 - Reduce efforts at simply phenotyping sleep problems in psychiatric disorders
 - Emphasize mechanistic studies of sleep and relationship to waking behaviors
 - Emphasize molecular neurobiology and circuitry of sleep, arousal, attentional states, and sleep's influence on cognitive and affective processes

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Areas ready for refocus

- Circadian phenomena
 - Shift emphasis from studies focusing *only* on molecular, behavioral or sensory circadian phenomena to those that relate to higher brain function and behaviors relevant to NIMH mission

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Areas ready for refocus

- Stress
 - Shift from acute to chronic stress
 - Compare mechanisms and consequences of different types of stress
 - Resilience

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Areas ready for refocus

- Neurotransmitter-signaling systems
 - Shift from extensively studied to less well understood systems

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Areas ready for refocus

- Prejudice and stereotyping
 - Move to studies with more transparent relevance to mental health issues
 - Prejudice and discrimination as chronic stressors
 - Interventions for targets of discrimination

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Areas better served by other institutes

- Visual and other primary sensory perception and motor processes
- Metabolic thermoregulation
- Characterization of the processes of normal development or aging without a compelling argument for the relevance to mental illness of behavioral disorders

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Concluding comments

- NIMH program staff should continuously scrutinize the portfolio to identify areas that may become overly subscribed or saturated
- Work with CSR to re-examine the focus and composition of study sections to better serve NIMH interests
- NIMH should create ways to foster and support translational research and training
- Training programs for basic scientists could include education on the clinical phenomena of mental illness (and the reverse)

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The bottom line

- The NIMH basic behavioral and neuroscience research portfolio is already in superb shape and serves the mission extremely well
 - *Caveat:* All things can be improved
- In the context of current budgetary realities, the portfolio can benefit from some shifts in emphasis and priority