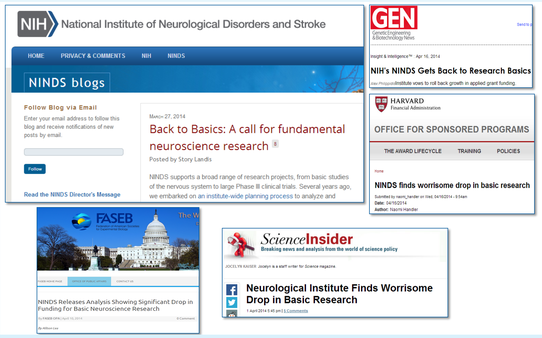
Trends in Support for Basic Science Research at NIMH

Yancy Bodenstein, Kevin Quinn
NIMH, Office of Science, Policy, Planning and Communication

NINDS Back to Basics



Cross Validation of NINDS and NIMH Categorization

- To assess the reliability of categorization decisions across Institutes we conducted a brief cross validation exercise.
- Assignment decisions were made while blind to the parent Institute's assignment.
- Because the largest discrepancy between NINDS and NIMH was in the Applied-Translation category we initially replicated how NIMH staff would sort NINDS grants in this category.
- Then we asked NINDS staff to blindly sort NIMH grants from all 4 categories.
- The results show that there is strong reliability across Institutes in assignments in the basic category but more discrepancies in how we make assignments in the applied category.

NIMH Category	NIMH Categorized NINDS grants		NINDS Categorized NIMH Grants	
	NINDS	NIMH	NINDS	NIMH
B-B		1	1 A-C, 4 B-B	5
B-DR		4	1 B-B, 4 B-DR	5
A-T	20	15	4 B-DR, 1 A-C	5
A-C			1 A-C, 1 B-B, 3 B-DR	5

Analysis of Basic-Basic Science Support by Division

There are 5 Extramural Program Divisions at NIMH:

- **Division of Aids Research (DAR)** - supports research to reduce the incidence of HIV/AIDS worldwide and to decrease the burden of living with HIV/AIDS.
- **Division of Adult Translational Research (DATR)** – supports programs aimed at understanding the pathophysiology of mental illness and hastening the translation of behavioral science and neuroscience advances into innovations in clinical care.
- **Division of Developmental Translational Research (DDTR)** - supports research with the ultimate goal of preventing and curing mental disorders that originate in childhood and adolescence.
- **Division of Services and Intervention Research (DSIR)** – supports intervention research to evaluate the effectiveness of interventions on mental and behavior disorders and also supports mental health services research.
- **Division of Neuroscience and Basic Behavioral Science (DNBBS)** - supports research in the areas of basic neuroscience, genetics, basic behavioral science, and drug discovery.

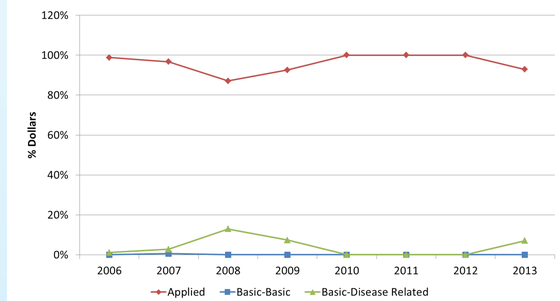
Each of these divisions supports a different mix of basic and clinical research.

DNBBS has a predominant focus on supporting basic research while DSIR has a similar focus but in the area of applied research. The missions of the other divisions reflect a more balanced focus on a combination of basic and applied research.

Looking at how our analysis breaks down the categories of support within the different divisions is an additional way of assessing the validity of our categorization procedures.

DSIR Competing Awards for Parent FOAs Only 2006-13

2006-13Excluding F, T, K, R13, IRP, Contracts, IAAs, ARRA, SBIR



NIMH/NINDS Analysis Comparison

NINDS Approach

- Defined 4 categories (Basic-Basic, Basic-Disease, Applied-Translational, Applied-Clinical
- Used Policy, Review and Program staff to sort grants into the 4 categories
- Primarily relied on abstract and specific aims sections
- Looked at 1997 to 2012 - coded all grants for 2 years and then 8 additional years sampled (coded 50% of grants <500K DC in those 8 years)
- Excluded ARRA, SBIR, Loan Repayment, R03s, R13s, Fs, Ts and Ks
- Assigned % in quartiles to the 4 categories (e.g., a grant could be 25% basic-basic and 75% basic-disease
- Type 1 and Type 2 only

NIMH Approach

- Used same 4 categories
- Used PARIS Coding System to make the categories as comparable as possible to NINDS
- Already have all the data: each year RAB analysts code all funded grants
- Range is 2002 to 2013 (time frame for PARIS)
- Analyzed all years within time frame
- Excluded ARRA, SBIR, Loan Repayment, Ts, R13s, Fs and Ks (we included R03s)
- Coding is all or none (no partial assignment to multiple categories)
- Type 1 and Type 2 only

Bottom Line: Criteria are reasonably comparable to NINDS

Examples of NIMH Research

Basic-Basic

- 1R01MH101268-01 Genetic targeting of cortical pyramidal neuron subtypes
- 2R01MH066179-11 Neuronal Polarity and Membrane Trafficking

Basic-Disease Related

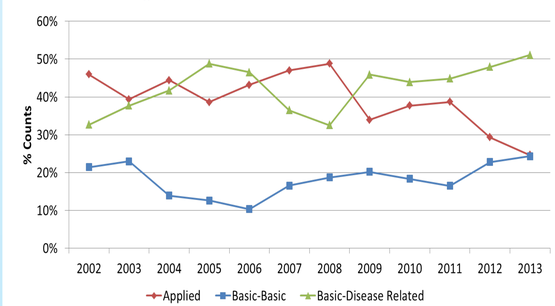
- 1R01MH101111-01 Quantitative Behavioral and Imaging Phenotypes of Amotivation in Schizophrenia
- 1R01MH099384-01A1 Role of NG2+-cells in brain homeostasis and depression

Applied

- 1R01MH099666-01A1 Precursors of first-episode psychosis in a population-based sample
- 5R01MH036197-27 Children at High and at Low Risk for Depression

Competing Awards for Parent FOAs Only 2002-2013

Excluding F, T, K, R13, IRP, Contracts, IAAs, ARRA, SBIR



Parent FOA Awards 2006-13 by Division

Excluding F, T, K, R13, IRP, Contracts, IAAs, ARRA, SBIR

	Applied	Basic-Basic	Basic-Disease Related
DAR	74.3%	0.3%	25.4%
DATR	60.7%	0.3%	39.0%
DDTR	63.4%	1.6%	35.1%
DSIR	96.4%	0.1%	3.6%
DNBBS	3.9%	38.9%	57.3%

Our categorization procedures appear to align well with the assigned missions of the different Divisions.

As an example, the mission of DNBBS to support basic science research is reflected in the categorization analysis which reflects an overwhelming focus in DNBSS on the basic-basic and basic-disease related categories.

This analysis supports the assertion that our categorization procedure is reasonable.

NIMH Criteria for assigning to the 4 categories

Basic: Basic – Research to understand normal neurological, behavioral, or cognitive processes, including all model systems (in vitro, in animals or in humans) and secondary data analyses.

Basic: Disease Related – Research into a specific diseased or disordered state that impacts normal behavior, such as understanding disease mechanisms or underlying genetic causes of disease, including all model systems (in vitro, in animals or in humans) and secondary data analyses.

Applied:

Research to develop or test diagnostics, therapeutics, psychosocial interventions, preventive interventions, or service delivery systems whether in animals, humans, or in vitro, as well as epidemiological and population based studies. All stages of development from proof of concept in disease models to human clinical trials are included. Studies that fit into both Basic and Applied categories (such as multi-project grants) should be given preference towards an Applied designation.

Applied: Translational – Includes all APPLIED studies up to, but not including, first in human studies and can include human tissue, DNA or human bodily fluids and secondary data analyses that fit the Applied definition above.

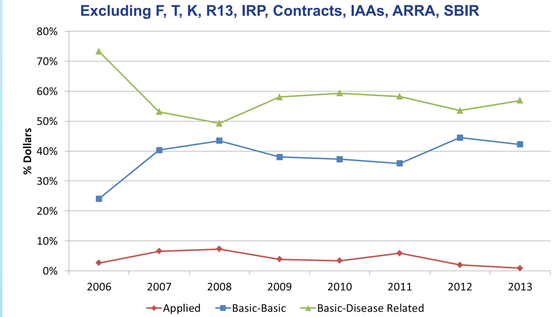
Applied: Clinical – This category includes all applied research in live humans that fit the Applied definition above; including first in human studies through phase III trials as well as secondary data analyses of clinical data collected from live humans. Applied studies that fit into both Translational and Clinical should be given preference towards a Clinical designation.

Percent of Budget by Science Category Comparing NINDS and NIMH

	1997	2002	2012	2013
NINDS				
Basic	87		71	
Applied	13		29	
Basic-Basic	52		27	
NIMH				
Basic		51		67
Applied		49		33
Basic-Basic		17		17

DNBBS Competing Awards for Parent FOAs Only 2006-13

Excluding F, T, K, R13, IRP, Contracts, IAAs, ARRA, SBIR



National Institute of Mental Health