

Distribution of Nonhuman Animal Versus Nonanimal Research Funding at Four U.S. Institutions in Fiscal Year 2000

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Much controversy exists concerning the use of nonhuman animals in biomedical research. Textbooks, articles, and journals are dedicated to studying animal models, studying alternatives, and debating various aspects of the issue. Surprisingly however, very little information exists on how many animals actually are used in the United States, the distribution of federally funded grants to researchers using animals versus those not using animals, and what criteria must be met when animals are to be used in biomedical research. In a recent pioneering study, Plous and Herzog (2001) examined the acceptance rates of animal model protocols by institutional animal care and use committees in different institutions in the United States.

If a baseline has not been established, we do not think it is possible to track changes in asset allocation vis-à-vis animal versus nonanimal research funding. We undertook this study to shed light on the issue of how much federally funded money is allocated to animal models in biomedical research.

METHOD

We surveyed National Institutes of Health (NIH) databases for all grants during Fiscal Year (FY) 2000 to Johns Hopkins University (1), Northeastern University

(311), East Carolina University (317), and University of Wyoming (324). The numbers in parentheses refer to the institutions' ranking in relation to all 2,570 NIH award recipients in FY2000 ("NIH Support to All Institutions," 2001).

We chose Johns Hopkins because it received the most grant money in 2000 ("NIH Support to All Institutions," 2001). We chose the other institutions because they were universities that, in contrast to Johns Hopkins, were smaller and received relatively little grant money. They each received at least 10 grants, however.

We chose the year for study at the NIH office: awards (NIH Office of Extramural Awards, 2004b) Web site and looked at the university data on their home state page, NIH office: home state page (NIH Office of Extramural Awards, 2003). The information we gathered from these pages included grant numbers, grant titles, names of principal investigators, and award amounts. The information on these pages comes from the NIH IMPAC II (Information for Management, Planning, Analysis, and Coordination) System. IMPAC II is the successor to NIH's original IMPAC information management system according to the NIH (Americans for Medical Advancement [AFMA], Europeans for Medical Advancement [EFMA], & Japanese for Medical Advancement [JFMA], 2004).

We identified the university and copied the data onto an Excel sheet. We cross-referenced the grant number and principal investigator (PI) as listed in the IMPAC II data with an entry in the Computer Retrieval of Information on Scientific Projects (CRISP, <http://crisp.cit.nih.gov/>) database for that grant.

The Office of Extramural Research at the NIH maintains this searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other research institutions. It includes projects funded by NIH, Substance Abuse and Mental Health Services, Health Resources and Services Administration, Food and Drug Administration, Centers for Disease Control and Prevention, Agency for Health Care Research and Quality, and Office of Assistant Secretary of Health. All data sheets can be viewed at AFMA, EFMA, and JFMA (2004).

The entries in CRISP usually include an abstract of the research project. The abstract usually provides adequate information for determining research modalities employed by the PI. We defined a research project as positive for animal-based research if it involved whole, intact animals or if the study was largely based on tissues taken from animals.

RESULTS

For FY2000, we found that Johns Hopkins received 1,222 grants totaling \$433,930,100. The distribution broke down as follows (see Table 1): 57.16% of

TABLE 1
Animal and Nonanimal Funding

	<i>Total Awards Amount</i>	<i>Amount of Money Funded to Studies Not Involving Animals</i>		<i>Amount of Money Funded to Studies Involving Animals</i>		<i>Unable to Determine</i>		<i>Total No. of Grants</i>	<i>Studies Not Involving Animals</i>		<i>Studies Involving Animals</i>		<i>Unable to Determine</i>	
		\$	%	\$	%	\$	%		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Johns Hopkins University	433,930,100	248,034,916	57.16	142,182,046	32.77	43,713,138	10.07	1,222	670	54.83	454	37.15	98	8.02
East Carolina University	4,397,272	2,218,234	50.4	1,824,581	41.5	354,457	8.1	20	6	30.0	12	60.0	2	10.0
University of Wyoming	3,986,956	464,388	11.6	3,522,568	88.4	0	0.0	11	4	36.4	7	63.6	0	0.0
Northeastern University	4,239,401	1,948,910	46.0	1,456,675	34.3	578,011	13.7	24	10	41.7	11	45.8	3	12.5

Note. Given in U.S. dollars.

all grant money was for research that, to the best of our ability to determine, did not involve animals, and these constituted 54.83% of all grants; 32.77% of grant money was for research we determined fulfilled our criteria for animal-base research and constituted 37.15% of all projects. We were unable to determine the use of 10.07% of the money, constituting 8.02% of all projects, either because no abstract was included on CRISP or because the abstract was too brief to make an accurate determination.

Northeastern University received \$4,239,401 of which \$1,948,910 (46%) went to studies involving animals whereas \$1,456,675 (34.3%) did not. We were unable to determine the destination of \$578,011 (13.7%). Of the 24 studies, 10 (41.7%) were studies involving animals; 11 (45.8%) were not. We were unable to determine 3 (12.5%).

East Carolina was awarded \$4,397,272 of which 2,218,234 (50.4%) went to studies that did not involve animals and 1,824,581 (41.5%) that did. We were unable to identify \$354,457 (8.1%). Of the 20 total grants, 6 (30%) did not involve animals and 12 (60%) did. We were unable to determine 2 (10%).

The University of Wyoming received \$3,986,956 of which \$464,388 (11.6%) went to studies not involving animals and \$3,522,568 (88.4%) that did. Of the 11 grants, 4 (36.4%) were nonanimal, and 7 (63.6%) involved animals.

DISCUSSION

Studies involving intact animals or animal tissues comprised a substantial percentage of grants and grant money. We do not think any other general conclusions can be drawn from a study this small but do think it is a start in examining this important issue. We would like to see a larger study conducted involving 100 research institutions evenly distributed between the top third, middle third, and bottom third of NIH funding as one might find differences in distribution of funding—animal versus nonanimal—depending on the size of the institution and the total amount funded.

It is our conjecture, supported by this small study, that smaller, less well-funded institutions are more likely to have a higher representation of animal studies than are larger, more well-funded institutions, such as Johns Hopkins, because the larger institutions might be NIH Centers of Clinical Excellence or might be more likely to be involved in large clinical studies, thus receiving a relatively larger amount in dedicated federal funds for clinical—hence nonanimal—purposes.

More studies need to be done in order to establish a baseline for the percentage of asset allocation to animal versus nonanimal funding. Once these studies are completed, analysis could be undertaken to determine the relative value of the projects in terms of contributing to the advancement of knowledge or treating disease.

CONCLUSIONS

As far as we are aware, our limited look at the four universities named here is the only such examination of the industry aimed at determining just how resources are allocated with regard to research modality.

Little empirical data exist with regard to animal usage in research, the success of the criteria used to determine the most likely productive research modality, the success of the criteria used to determine whether an animal model will be likely to be productive, the number of animals actually used, the success of the criteria used to determine the results of using specific species or strains, or much else regarding animal models generally or specifically.

It is our opinion that the decisions made in this regard are not science based. It appears to us that vested interests drive and control the process of resource allocation rather than a dispassionate evaluation of empirical data. It is our hope that our cursory efforts will encourage others to begin collecting and evaluating verifiable data that can be used to aid us in making informed decisions regarding the use of animals in biomedical research.

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