

LIFE SCIENCES FORUM

A Profile of the Members of FASEB Societies: NIH Awards, Degrees, and Institutional Affiliations, 1999

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ABSTRACT Data from the *FASEB Directory of Members* and NIH were used to develop a statistical profile of the members of FASEB Societies. For the U.S.-based scientists (exclusive of retired and student members), the most frequently reported degree was a research doctorate (69.6%). A substantial fraction, however, reported medical degrees (19.2%) or both research and medical degrees (8.0%). The majority of members of FASEB Societies listed academic affiliations in the directory. Industrial affiliations were reported, however, in 9.7% of the entries with smaller fractions listing associations with hospitals, independent research institutes, and government agencies. Just over one-fourth of the members of FASEB Societies were principal investigators on NIH research grants. These investigators received one-half of all NIH grants and nearly 60% of the RO1 grants—Garrison, H. H., Lahiri, S., Stephens, D. A profile of the members of FASEB societies: NIH awards, degrees, and institutional affiliations, 1999. *FASEB J.* 14, 2–5 (2000)

THE FEDERATION OF American Societies for Experimental Biology (FASEB) was established in 1912 by representatives of The American Physiological Society, the American Society for Biological Chemists, and the American Society for Pharmacology and Experimental Therapeutics. The following year, the Society for Experimental Pathology joined, and in the 1940s the American Institute of Nutrition and The American Association of Immunologists became members of the Federation (1). The American Society for Cell Biology became an associate member in 1983. In the 1990s, FASEB grew rapidly following a major reorganization sparked by a 1989 retreat held in Williamsburg, Va. By 1992 there were seven societies, totaling 33,000 unduplicated members. At the present time there are 19 societies (14 full members and five associate members). Together, these societies have a grand total of more than 66,000 unduplicated members, twice the number of members reported in 1992.

In light of this expansive growth, a profile of the members of FASEB Societies was created to update an earlier study (2). The results of an analysis of degrees, institutional affiliations, and grants from the National Institutes of Health (NIH) are presented below.

CHARACTERISTICS OF FASEB SOCIETY MEMBERS

Each society in the Federation is an independent organization and collects unique sets of information about the characteristics and activities of its members. Societies do not use a common format for collecting or reporting demographic data. Thus, a set of strictly comparable data from all FASEB Member Societies is not available. Useful information may be obtained, however, from character string searches and manual classification of information compiled in the *FASEB Directory of Members*. Because the analysis focused on research funding from NIH, it was restricted to active (not retired) scientists who are U.S. residents. Student members were also excluded from the study, leaving a population of 44,043 individuals.

Information on the doctoral degrees of FASEB Society members was obtained from a manual review of a random sample of 1000 listings from the study database. The most frequently reported degree was the Ph.D., with 69.6% of the directory entries listing only this degree (**Table 1**). An M.D., O.D., or equivalent degree is listed by 19.2% of the sample. An additional 8.0% report a Ph.D. along with another professional doctorate degree (M.D., O.D., D.V.M., or D.D.S.); only 0.3% indicate a dental or veterinary medical degree. When dual degree holders (M.D.-Ph.D., D.D.S.-Ph.D., or D.V.M.-Ph.D.) are included, the total number of individuals indicating medical, dental, or veterinary training increases to 27.5%. Only a small fraction of the FASEB Society members

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TABLE 1. *Doctoral degrees reported by FASEB Society members*

Degree	Number	Percentage	95% Confidence interval ^a
Ph.D. and equivalent only	504	69.6%	3.4%
M.D. and equivalent ^b only	139	19.2%	2.9%
D.V.M., D.D.S. and equivalent only	2	0.3%	0.4%
Other degrees	21	2.9%	1.2%
Ph.D. and M.D., D.V.M., D.D.S., or equivalent	58	8.0%	2.0%
Total reporting degree	724	100.0%	
Degree data not reported ^c	276		
Total in sample	1,000		

^a The 95% confidence intervals are calculated by the following formula: $\pm 1.96\sqrt{(pa/(n-1))}$, where p = the proportion, $q = 1 - p$, and n = the sample size.

^b Includes M.D., D.O., M.B.B.S., M.B.B.C.H., M.R.C.S.

^c Three FASEB Societies do not collect this information.

(2.9%) report another degree (M.P.H., R.N., or M.S., or other) without listing a doctoral degree.

To obtain a perspective on the institutional affiliations of the members of FASEB Societies, data reported in the address listings from the *FASEB Directory of Members* were reviewed and classified according to type of institution. Again, a random sample of 1000 directory entries was used. The most frequently listed institutional affiliations are academic (52.6%), with smaller fractions of the membership listing academic health centers or teaching hospitals (6.3%), veterans hospitals (1.5%), other hospitals (5.5%), independent research institutes (5.0%), private industry (9.7%), and government agencies (5.7%). Since some individual listings do

TABLE 2. *Institutional affiliation of FASEB Society members*

Institutional address	Number	Percentage	95% Confidence interval ^a
University, college, or medical school	526	52.6%	3.1%
Independent research institute	50	5.0%	1.4%
Teaching hospital or academic health center	63	6.3%	1.5%
Veterans hospital	15	1.5%	0.8%
Hospital (other)	55	5.5%	1.4%
Government (excluding VA)	57	5.7%	1.4%
Industry	97	9.7%	1.8%
Other (including unspecified and unclassified)	137	13.7%	2.1%
Total	1000	100.0%	

^a The 95% confidence intervals are calculated by the following formula: $\pm 1.96\sqrt{(pa/(n-1))}$, where p = the proportion, $q = 1 - p$, and n = the sample size.

TABLE 3. *Number of FASEB Society members who are 1998 NIH Principal Investigators*

FASEB Society status	Number	Percentage
Grantees	11,260	25.6%
Non-grantees	32,783	74.4%
Total membership of FASEB Societies	44,043	100.0%

not include the name of an institution (or a name that can be classified), 13.7% of the sample could not be assigned to one of these categories (Table 2).

The vast majority of FASEB Society members list academic, hospital, or independent research institutions as part of their address. While this analysis provides a useful overview of the scientists in the FASEB Societies, interpretations of these data are subject to one important caveat. Those individuals with more than one institutional affiliation can list only one address in the *FASEB Directory*, and Society Members are forced to choose when reporting affiliations. Data are therefore incomplete for individuals with multiple institutional affiliations.

NIH RESEARCH GRANTS

In 1998, NIH awarded 34,662 research grants totaling \$9,801,789,027. These grants went to 25,470 researchers, with many researchers receiving more than one award. The populations of NIH grantees and FASEB Society members were linked by last name, first initial, and first two digits of the zip code. The resulting matches were then manually reviewed for errors. This process revealed a total of 11,260 grantees among the 44,043 FASEB Society members in the analytic sample (Table 3). Just over one-fourth of FASEB Society members (25.6%) are principal investigators on NIH grants. This does not include project directors on Program Project Grants (PO1), who are not listed individually in the NIH data file. Although useful, this process offers a narrow view of researchers funded by NIH since it also excludes co-investigators, collaborators, and other employees on NIH-funded projects. It should be noted that the population of FASEB Society members also includes scientists in government (5.7% of total) and industry (9.7% of total) whose research is not typically supported by extramural grants from NIH. The fraction of FASEB Society members funded by NIH would be larger if the calculation was restricted to those indi-

TABLE 4. *Number of 1998 NIH research grant recipients with membership in FASEB Societies*

Grantee organization	Number	Percentage
FASEB Society	11,260	44.2%
Other grantees	14,210	55.8%
Total NIH awards	25,470	100.0%

TABLE 5. Number and percentage of NIH research grants to FASEB Society members in 1998

Grantee organization	Number	Percentage
FASEB Society	17,565	50.7%
Other	17,097	49.3%
Total	34,662	100.0%

viduals employed in academia, hospitals, or independent research facilities.

While one-quarter of the members of FASEB Societies are principal investigators on NIH research grants, these 11,260 individuals comprise 44.2% of the 25,470 NIH grantees (Table 4). Again, since this count lists only principal investigators, it does not fully represent the total volume of participation by FASEB Society members in NIH-sponsored research.

The number of grants awarded to members of FASEB Societies (rather than the number of grantees) provides another perspective on the level of participation by FASEB Society members in the NIH extramural research program. Of the 34,662 research grants awarded in by NIH in 1998, just over half (17,565 or 50.7%) are awarded to people listed in the 1999 FASEB Directory (Table 5). The fraction of awards to FASEB Society members is greater than the fraction of grantees, indicating that the FASEB Society grantees are more likely than other grantees to have multiple awards from NIH.

In addition to looking at the number of awards to members of FASEB Societies, it is also informative to look at the total amount awarded. In 1998, NIH granted extramural research awards totaling more than \$9.8 billion. Of this amount, nearly \$5.7 billion (57.8%) went to members of FASEB Societies (Table 6). The percentage of extramural funds awarded to members of FASEB Societies (57.8%) is greater than the percentage of awards made to FASEB Society members (50.7%), indicating that the typical award to members of FASEB Societies is larger than that of other awardees.

Perhaps the clearest perspective on the role of FASEB Society members in the NIH extramural program is seen in the analysis of Research Project (RO1) Awards. These investigator-initiated, merit-reviewed grants are the core mechanism of the NIH extramural research system. Members of FASEB Societies received 12,492 (59.1%) of the 21,145 RO1 awards made in 1998 (Table 7).

TABLE 6. Total amount of NIH research grants to FASEB Society members in 1998

Grantee organization	Number	Percentage
FASEB Society	\$5,661,897,980	57.8%
Other	\$4,139,891,047	42.2%
Total	\$9,801,789,027	100.0%

TABLE 7. Number and percentage of RO1 grants to FASEB Society members in 1998

Grantee organization	Number	Percentage
FASEB Society	12,492	59.1%
Others	8,653	40.9%
Total	21,145	100.0%

Examination of the level of funding received by members of FASEB Societies adds a perspective on the size of the research effort being undertaken. RO1 awards to members of FASEB Societies total nearly \$3.4 billion (62.3%) of the \$5.4 billion in RO1 grants made by NIH (Table 8).

The percentage of research grants awarded to members of FASEB Societies varies across the 21 NIH institutes and centers granting extramural awards (Table 9). Examining the distribution of all NIH grants—for which the total fraction going to members of FASEB Societies is 50.7%—the percentage of grants awarded to FASEB Society members is greatest for the awards made by the National Institute of Diabetes and Digestive and Kidney Diseases (84.6%), National Institute of Arthritis and Musculoskeletal and Skin Diseases (79.1%), Fogarty International Center (70.9%), National Heart, Lung, and Blood Institute (68.0%), and National Institute of General Medical Sciences (61.0%). FASEB Society members are less frequent recipients of grants from the National Institute of Nursing Research (5.9%), National Institute of Mental Health (16.4%), National Library of Medicine (20.3%), and National

TABLE 8. Total amount of RO1 awards to FASEB Society members in 1998

Grantee organization	Number	Percentage
FASEB Society	\$3,360,739,103	62.3%
Other	\$2,034,889,215	37.7%
Total	\$5,395,628,318	100.0%

Distribution of NIH Research Grants to FASEB Society Members 1998, by Institute

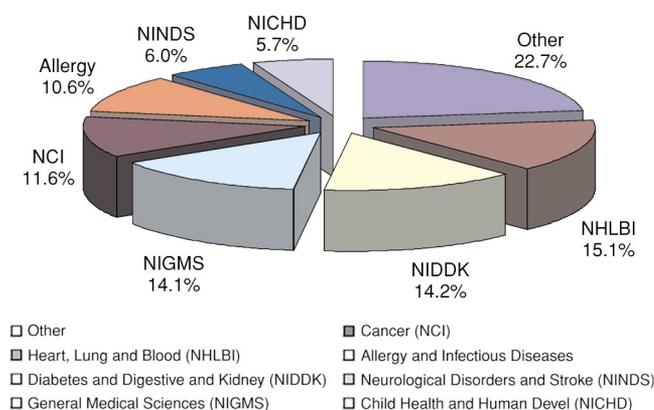


TABLE 9. NIH research grants to FASEB Society members in 1998, by NIH institute

NIH Institute	FASEB awards	Total awards	Percentage FASEB
Alcohol Abuse and Alcoholism (NIAAA)	236	692	34.1%
Aging (NIA)	598	1405	42.6%
Allergy and Infectious Diseases (NIAID)	1856	3426	54.2%
Arthritis and Musculoskeletal (NIAMS)	766	969	79.1%
Cancer (NCI)	2038	4915	41.5%
Drug Abuse (NIDA)	361	1394	25.9%
Deafness and Communication (NIDCD)	145	708	20.5%
Dental and Craniofacial (NIDR)	251	623	40.3%
Diabetes and Digestive and Kidney (NIDDK)	2493	2947	84.6%
Environmental Health (NIEHS)	281	640	43.9%
Eye (NEI)	487	1288	37.8%
General Medical Sciences (NIGMS)	2480	4064	61.0%
Child Health and Human Devel (NICHD)	1003	1763	56.9%
Human Genome (NHGRI)	114	227	50.2%
Heart, Lung and Blood (NHLBI)	2649	3897	68.0%
Library of Medicine (NLM)	16	79	20.3%
Mental Health (NIMH)	339	2064	16.4%
Nursing Research (NINR)	14	239	5.9%
Neurological Disorders and Stroke (NINDS)	1050	2480	42.3%
Research Resources (NCRR)	283	694	40.8%
Fogarty International Center (FIC)	105	148	70.9%
Total	17565	34662	50.7%

Institute of Deafness and Communicative Disorders (20.5%).

Although members of FASEB Societies received research grants from all of the NIH institutes and centers making awards, the grants to members of FASEB Societies come primarily from seven institutes (Fig. 1). The institutes with the most grants to FASEB society members are the National Heart, Lung, and Blood Institute (2649), the National Institute of Diabetes and Digestion and Kidney Diseases (2493), the National Institute of General Medical Sciences (2480), the National Cancer Institute (2038), the National Institute of Allergy and Infectious Diseases (1856), the National Institute of Neurological Disorders and Stroke (1050), and National Institute of Child Health and Human Development (1003).

CONCLUSION

Data from the *FASEB Directory of Members* and NIH were used to provide a perspective on the character-

istics and activities of the U.S.-based members of FASEB Societies. While the majority are Ph.D. scientists working in academic settings, there are also a substantial number of physician-scientists (over 27%) and a small, but sizeable fraction that can be identified with industry (9.7%). Members of FASEB Societies participate extensively in the NIH extramural research program, comprising 44.2% of the grantees. They receive 50.7% of the grants, 57.8% of the total funds awarded, 59.1% of the RO1 grants, and 62.3% of the RO1 dollars. FJ

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