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The Physiologist

Volume 42, Number 2

April 1999

Walter F. Boron 72nd President of APS

During the APS Business Meeting at EB '99, the President's gavel will be passed from L. Gabriel Navar to me. In preparing to become the 72nd President of APS, I have been reviewing the vision statements of the previous four APS Presidents. I was struck by the gradual shift in mood from the pessimistic to the more optimistic, largely reflecting the history of NIH funding. When he wrote his statement in 1995, Leonard S. "Jim" Jefferson rightfully lamented the dismal state of NIH funding. Thanks to his efforts, as well as those of the then current APS Council and the reorganized FASEB, funding gradually began to improve. In 1996, James A. Schafer was clearly pleased with the most recent 5.7% increase in NIH funding, but warned that such a "windfall" was unlikely again in the foreseeable future. However, the windfalls did continue, and in 1997, Allen W. Cowley, Jr. was able to focus his attentions on non-NIH matters. By 1998, Gabriel Navar enthusiastically summarized the plans of many on Capitol Hill to increase the FY1999 NIH budget by as much as 15%. Indeed, the FY1999 Federal Budget includes an unprecedented 15.3% increase for the NIH. Moreover, assuming that Congress has its way, the NIH budget may continue to increase substantially for the next few years.

Of course, the NIH budget is only one factor affecting the health of the discipline of physiology, departments of physiology, and APS. Some of these other factors have been quite good to us. Others are more ominous. To quote Allen Cowley's 1997 statement, "everything is not yet coming up roses." Where does the Society stand in 1999? I think that the Society is in good shape and poised for an even brighter future. However, before addressing the state of the Society, I



would like to consider the health of the discipline of physiology and of departments of physiology. Without the "discipline," there would be no Society. Without the departments, it would be difficult for the discipline to flourish.

The Discipline of Physiology

"It was the best of times ..."

It is hard not to be optimistic about the discipline of physiology. The NIH budget for research is increasing at an unprecedented pace, fueling a dynamic and productive research engine of which "physiology" is a key part. Those reductionists among us are armed with increasingly sophisticated tools for studying the cellular and molecular basis of function—that is, physiology.

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ACDP 1998 Survey Results

Association of Chairs of Departments of Physiology 1998 Survey Results

Aubrey E. Taylor and Kelli M. Roberson

Department of Physiology, University of South Alabama, Mobile, Alabama

The Association of Chairs of Departments of Physiology annual survey was mailed to 158 physiology departments throughout the US, Canada, and Puerto Rico. A total of 96 surveys were returned, for a response

rate of 60%. This rate is lower than the 1997 survey (67%). The data provide the reader with general trends of faculty, salary, overall departmental budgets, and space available for research. Faculty salary information (Tables 1-3)

is derived from the total compensation column, which includes any supplementary income but not fringe benefits. In addition to salary information, further data are provided on tenure, gender, ethnicity, and salary by number of

Table 1. Faculty Salaries for Fiscal Year 1998

	Mean	% Change From Previous Survey	Minimum	Maximum	No. of Faculty
Chairmen					
All schools	\$148,802	5.2	\$72,879	\$233,000	93
Medical public	147,009	6.3	76,185	233,000	57
Medical private	160,232	3.9	83,000	226,256	30
Nonmedical	134,647	14.7	104,315	148,762	7
Female	119,960	37.2	83,000	156,350	3
Professors					
All schools	99,754	5.4	34,436	226,000	654
Medical public	97,786	6.6	34,436	192,324	415
Medical private	109,688	4.3	38,000	226,000	183
Nonmedical	87,346	-4.4	40,559	161,564	56
Female	98,415	6.9	40,559	174,645	82
Associate Professors					
All schools	72,259	6.4	27,965	120,000	404
Medical public	71,991	6.8	27,965	115,875	236
Medical private	73,550	4.9	41,500	120,000	138
Nonmedical	71,074	14.1	46,242	86,987	30
Female	72,641	8.2	42,745	105,000	71
Assistant Professors					
All schools	57,511	0.0	21,200	100,786	321
Medical public	56,944	3.3	21,200	85,515	165
Medical private	58,723	7.6	31,000	100,786	134
Nonmedical	57,365	-1.1	24,870	76,328	22
Female	54,679	1.7	21,200	74,527	100
Instructors					
All schools	39,134	0.4	18,203	77,216	47
Medical public	31,550	-1.6	18,203	77,216	36
Medical private	38,465	-5.0	30,385	45,617	9
Nonmedical	28,025	-56.8	25,000	30,449	2
Female	41,070	13.2	18,203	77,216	19

ACDP 1998 Survey Results

years in rank.

The statistics are based on 96 responses (4 from Canada) but salary, tenure, gender, ethnicity, and number of years in rank results are calculated on the number of respondents providing this information. From the return surveys, there was one institution that did not provide any faculty information. The salaries of only 4 faculty members

were not reported among all institutions. Also missing for some faculty were years in rank (51), and ethnicity (36).

Student/trainee information is provided by ethnicity for predoctoral and postdoctoral categories, as well as predoctoral trainee completions, stipends provided, and type of support.

Departmental budget information (Table 4) shows type of support, faculty salaries derived from grants, negotiated indirect costs to the departments. Table 5 ranks responding institutions according to their total dollars, research grant dollars, and departmental space. Space averages are presented as research, administration, teaching, and other. ❖

Table 2. Average Salary by Number of Years in Rank

Chairpersons			Professors			Associate Professors			Assistant Professors			Instructors		
Years	Salary	No. of faculty	Years	Salary	No. of faculty	Years	Salary	No. of faculty	Years	Salary	No. of faculty	Years	Salary	No. of faculty
0-5	\$134,588	28	0-5	\$94,965	185	0-5	\$71,086	223	0-5	\$56,849	262	0-5	38,924	35
6-10	149,585	29	6-10	98,816	166	6-10	72,426	93	6-10	60,635	53	6-10	43,845	7
11-15	159,011	15	11-15	103,381	130	11-15	72,977	33	11-15	49,116	2	11-15	40,331	1
16-20	170,836	12	16-20	104,308	85	16-20	78,703	23	16-20	69,858	2	16-20	0	0
21-25	138,072	9	21-25	105,680	62	21-25	73,318	20	21-25	0	0	21-25	0	0
26+	175,936	2	26+	108,243	30	26+	69,398	14	26+	0	0	26+	30,193	3

Type of Institution (n = 96)

Support		Teaching Interactions			
Public	64	MD/DO	86	Pharmacy	21
Private	32	DDS	25	Other biomedical	48
		DVM	7	Life science	42
		Allied health	48	Bioengineering	26

Student/Trainee Summary

Total number of pre- and postdoctoral students/trainees			
Predoctoral male	953	Postdoctoral male	661
Predoctoral female	618	Postdoctoral female	342
Total number of foreign pre- and postdoctoral students/trainees			
Predoctoral male	294	Postdoctoral male	405
Predoctoral female	208	Postdoctoral female	170

Faculty Summary (n = 1,490)

	Male	Female
American Indian/Alaskan Native	0	0
Asian/Pacific Islander	100	27
Black, not Hispanic origin	21	9
Hispanic	68	17
White, not of Hispanic origin	989	209
Foreign national	39	11

Ethnicity of each pre- and postdoctoral student/trainee

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
American Indian/Alaskan Native	1	1	1	1
Asian/Pacific Islander	73	35	48	37
Black, not Hispanic origin	30	43	8	10
Hispanic	27	19	14	6
White, not of Hispanic origin	528	312	185	118

Tenure status in each department by degree (n = 1,462)

	Tenured	Not Tenured	Not Eligible	Total
MD	47	13	5	65
PhD	920	285	99	1304
Both	47	19	6	72
Other	11	5	5	21

Number of foreign pre- and postdoctoral students/trainees

	Predoctoral		Postdoctoral	
	Male	Female	Male	Female
African	9	4	7	4
Asian/Pacific Islander	133	92	236	65
Central and South American	14	7	22	6
European, Canadian, Australian	107	87	112	75
Middle Eastern	21	10	20	10
Other	10	8	8	10

ACDP 1998 Survey Results

Number of foreign pre- or postdoctoral trainees whose primary source of support is:

	<i>Predoctoral</i>	<i>Postdoctoral</i>
Institutional	130	84
Research grants	423	231
Private foundations	58	35
Home (foreign) governments	38	10
Other	38	12

Foreign National predoctoral trainee completions:

	<i>Male</i>	<i>Female</i>
African	1	0
Asian or Pacific Islander	22	16
Central or South American	2	1
European, Canadian, Australian	6	10
Middle Eastern	6	2
Other	2	0

Predoctoral Trainee Completions

Number of trainees who have completed doctoral work during the year ended June 30, 1998 (*n* = 65)

<i>Predoctoral male</i>	142	<i>Predoctoral female</i>	110
-------------------------	-----	---------------------------	-----

Average annual starting stipend (in US dollars) for trainees:

<i>Predoctoral (n = 87)</i>	<i>Postdoctoral (n = 82)</i>
\$14,447.78	\$26,066.41

US citizen/resident alien predoctoral trainee completions:

	<i>Male</i>	<i>Female</i>
American Indian/Alaskan Native	0	0
Asian or Pacific Islander	12	12
Black, not of Hispanic origin	5	14
Hispanic	4	4
White, not of Hispanic origin	82	51

Space Controlled by Department (*n* = 96)

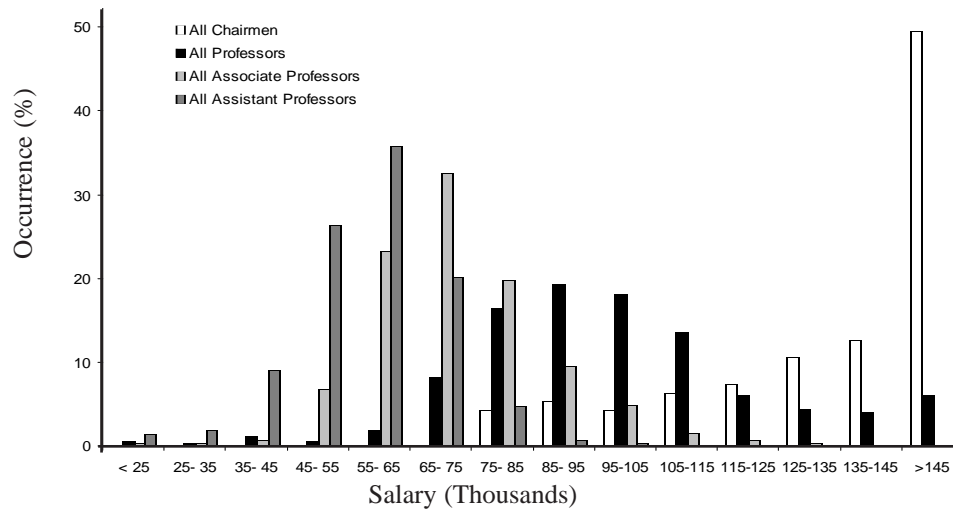
Research	16,298
Administration	2,662
Teaching	1,690
Other	1,509
Total space	22,158

Table 3. Salaries by Region

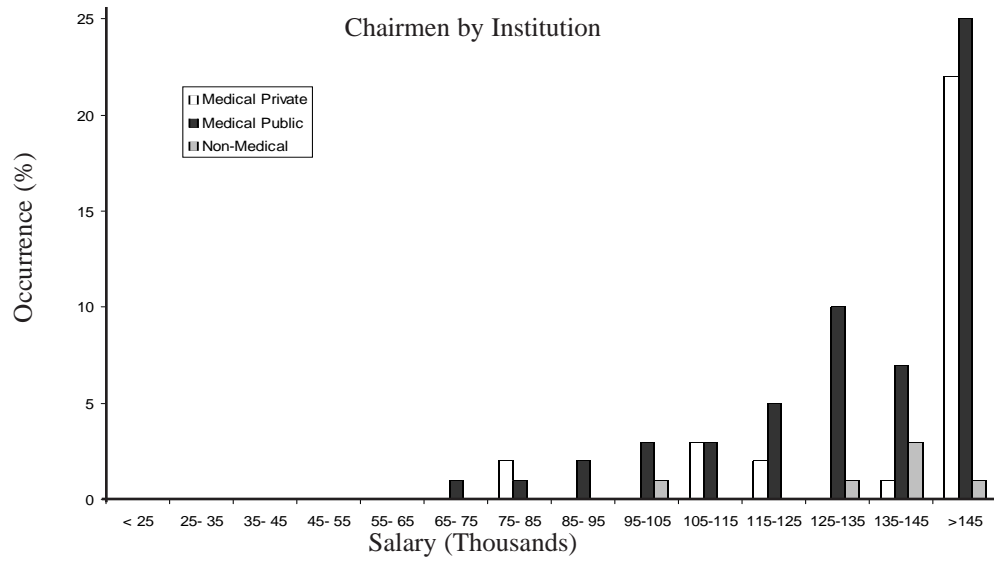
Region	Mean	Minimum	Maximum	Number	
Chairmen					
Northeast	\$155,913	\$89,432	\$211,961	22	Northeast: ME, NH, VT,
Midwest	152,726	76,185	226,256	30	NY, MA, RI,
South	149,798	85,449	233,000	31	CT, NJ, PA,
West	136,854	85,765	175,000	8	MD, DE, DC
Canada/Puerto Rico	96,434	77,879	108,171	4	
Professors					
Northeast	110,517	25,000	200,000	132	Midwest: MI, OH, IN,
Midwest	102,311	38,000	205,000	198	IL, WI, IA,
South	96,434	10,000	226,000	209	MO, KS, NE,
West	92,319	35,436	186,594	78	ND, SD, MN
Canada/Puerto Rico	83,831	20,627	106,353	41	
Associate Professors					
Northeast	77,175	41,500	120,000	102	South: VA, WV, KY,
Midwest	74,263	47,258	125,000	141	TN, NC, SC,
South	68,994	27,965	119,025	104	GA, FL, AL,
West	66,448	46,242	106,987	41	MS, AR, LA,
Canada/Puerto Rico	60,801	5,000	75,161	18	OK, TX
Assistant Professors					
Northeast	60,070	21,200	100,786	70	West: AK, HI, MT,
Midwest	60,265	28,463	84,000	106	WY, CO, NM,
South	55,352	24,787	72,000	101	AZ, ID, NM,
West	52,438	24,870	77,145	30	WA, OR, CA,
Canada/Puerto Rico	49,122	7,810	55,777	12	UT
Instructors					
Northeast	51,342	38,275	77,216	5	
Midwest	35,798	29,000	42,000	10	
South	38,613	18,203	65,000	27	
West	34,478	30,449	38,601	3	
Canada/Puerto Rico	40,000	40,000	40,000	1	

ACDP 1998 Survey Results

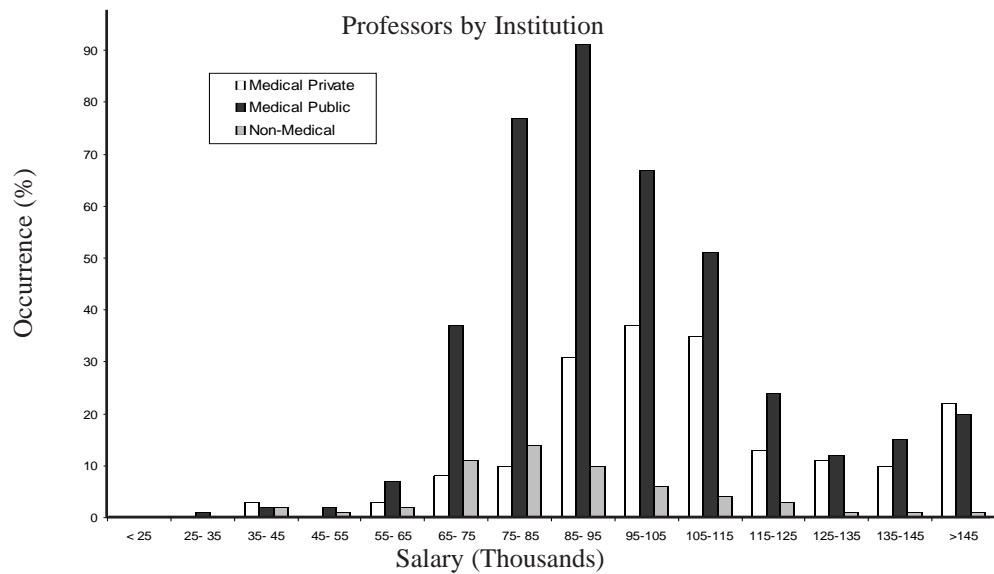
Salary Comparison by Title



Chairmen by Institution



Professors by Institution



ACDP 1998 Survey Results

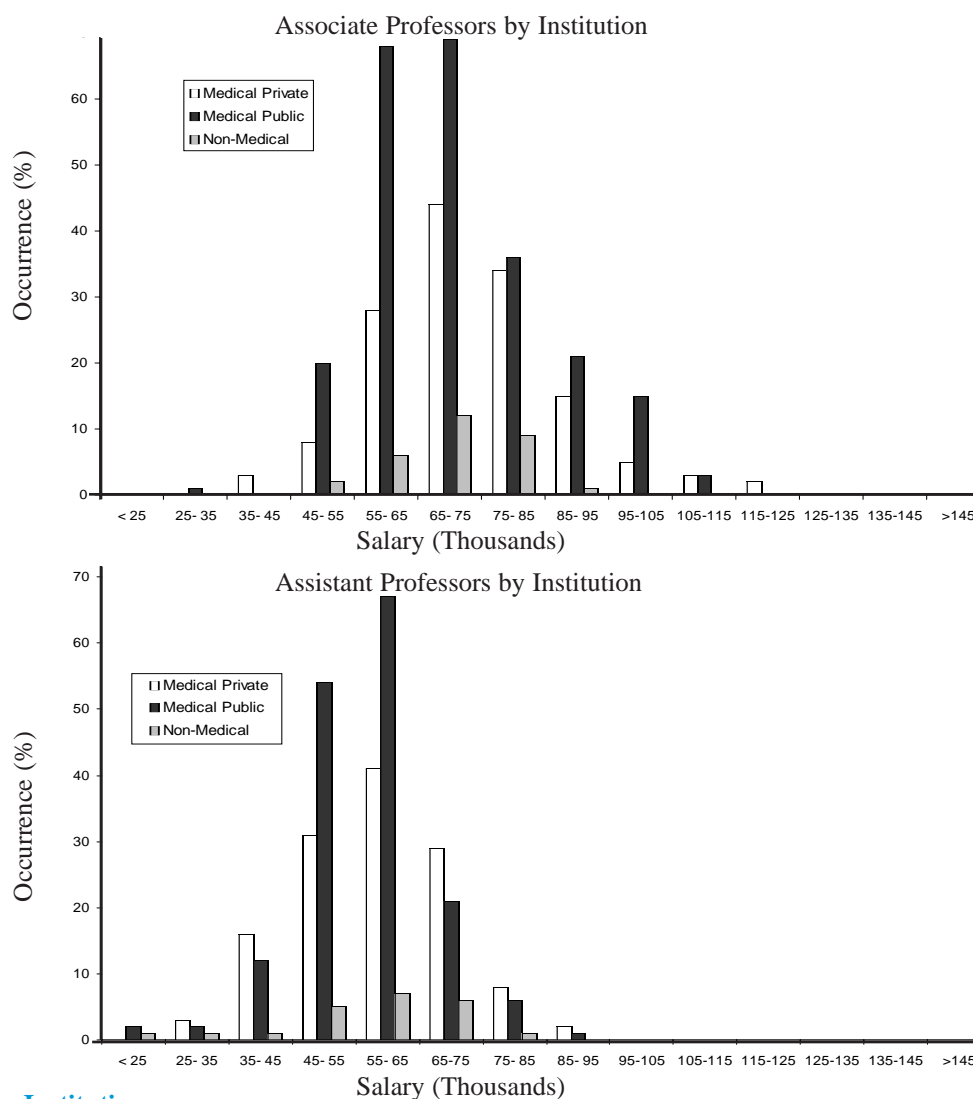


Table 4. Budgets by Institutions

	All Institutions	No.	Public Medical	No.	Private Medical	No.	Nonmedical	No.
Institutional	\$1,479,552	93	\$1,537,552	57	\$1,365,418	30	\$1,724,580	7
Outside research grants (direct costs only)	2,582,062	93	2,247,311	57	3,213,643	30	2,601,115	7
Training grants (direct costs only)	252,647	53	183,786	30	373,455	19	135,865	3
Endowments	154,357	39	172,530	27	115,561	11	154,357	1
Indirect recovery costs (amount to dept.)	101,813	49	85,730	36	202,600	6	98,138	6
Other budget support	291,550	54	286,058	34	310,803	15	271,137	5
Average	4,509,841	93	4,094,977	57	5,260,506	30	4,891,986	7
Standard deviation	2,624,552		2,329,535		3,109,137		2,303,408	

Financial Information

Percentage of total faculty salaries derived from research grants (not including fringe benefit amounts):	30.5%	(n = 79)
Current fringe benefit rate most frequently used for primary faculty:	24.3%	(n = 93)
Percentage of allocated faculty salary dollars raised from grants, etc., directly returned to your department:	73.5%	(n = 51)
Federally negotiated indirect cost rate for FY 96-97 on campus:	51.2%	(n = 90)
off campus:	25.4%	(n = 67)
Percentage of indirect costs returned to your department:	17.9%	(n = 42)

ACDP 1998 Survey Results

Table 5. Complete Ranking According to Total Dollars

Rank Total Dollars	Total Dollars	Rank Research Grant Dollars	Research Grant Dollars	Rank Research Dollars/ Faculty	Research Dollars/ Faculty	Rank Total Research Space	Research Space (sq. ft.)	Rank Research Dollars/ sq. ft.	Research Dollars/ sq. ft.	No. of Faculty
1	\$13,124,393	1	\$10,183,940	1	\$442,780	20	24,660	3	\$413	23
2	10,194,335	2	7,960,957	11	256,805	12	28,137	6	283	31
3	10,006,732	3	6,829,537	3	325,216	13	26,850	11	254	21
4	9,091,923	5	6,271,210	15	232,267	2	37,354	33	168	27
5	9,075,387	6	6,047,897	21	208,548	24	21,638	7	280	29
6	8,448,375	9	5,081,390	33	181,478	26	21,316	16	238	28
7	8,320,600	7	6,000,000	6	285,714	4	35,500	32	169	21
8	8,047,988	17	4,531,471	27	197,020	1	41,608	62	109	23
9	8,035,036	35	2,803,213	46	140,161	9	28,885	66	97	20
10	8,024,970	4	6,455,163	4	322,758	81	7,203	1	896	20
11	7,968,296	21	4,076,345	18	226,464	17	25,691	37	159	18
12	7,831,269	11	4,975,554	36	165,852	29	19,980	12	250	30
13	7,706,856	12	4,899,458	28	195,978	53	14,800	4	331	25
14	7,704,000	10	4,983,000	17	226,500	3	35,577	46	140	22
15	7,459,843	22	3,858,164	24	203,061	14	26,141	42	148	19
16	6,927,614	19	4,216,550	10	263,534	41	17,479	13	241	16
17	6,866,992	18	4,469,489	42	148,983	15	26,129	30	171	30
18	6,860,666	13	4,853,561	5	303,348	25	21,397	17	227	16
19	6,845,320	8	5,397,774	8	269,889	36	18,660	5	289	20
20	6,784,428	25	3,729,984	32	186,499	49	15,688	15	238	20
21	6,686,000	15	4,756,000	7	279,765	5	30,000	38	159	17
22	6,496,540	273	3,562,531	51	127,233	21	24,241	43	147	28
23	6,366,264	16	4,573,501	26	198,848	10	28,461	36	161	23
24	6,205,637	30	3,120,171	44	141,826	45	16,544	27	189	22
25	6,191,498	33	2,951,901	39	155,363	18	25,439	58	116	19
26	6,182,183	20	4,110,437	41	152,238	32	19,520	20	211	27
27	6,147,662	24	3,748,676	14	234,292	40	17,972	21	209	16
28	6,023,962	14	4,823,827	2	401,986	42	17,233	8	280	12
29	5,988,104	23	3,795,394	25	199,768	7	29,512	52	129	19
30	5,842,000	26	3,600,000	13	240,000	11	28,350	53	127	15
31	5,532,948	49	2,306,106	69	100,265	19	25,327	70	91	23
32	5,479,044	44	2,569,245	38	160,578	33	19,480	51	132	16
33	5,386,911	28	3,500,000	35	175,000	39	18,000	26	194	20
34	5,359,918	43	2,570,254	68	102,810	22	22,672	59	113	25
35	5,209,601	45	2,485,644	55	118,364	16	26,025	67	96	21
36	5,150,202	42	2,570,524	70	98,866	94	3,097	2	830	26
37	5,079,819	32	2,997,219	49	136,237	8	29,806	65	103	22
38	5,004,579	39	2,645,320	23	203,486	54	14,634	28	181	13
39	4,965,936	36	2,755,312	57	114,805	23	21,719	54	127	24
40	4,883,850	29	3,458,000	16	230,533	44	16,773	22	206	15
41	4,856,529	41	2,577,373	61	112,060	38	18,298	45	141	23
42	4,822,899	54	1,993,798	67	104,937	68	9,941	24	201	19
43	4,635,920	34	2,816,000	31	187,733	47	16,288	29	173	15
44	4,482,208	47	2,404,000	45	141,412	43	16,921	44	142	17
45	4,471,078	71	1,060,898	81	48,223	28	20,940	83	51	22
46	4,411,984	40	2,645,290	9	264,529	58	12,978	23	204	10
47	4,204,678	38	2,672,295	20	222,691	59	12,667	19	211	12
48	4,200,000	53	2,000,000	52	125,000	27	21,309	69	94	16

ACDP 1998 Survey Results

Table 5 (continued).

Rank Total Dollars	Total Dollars	Rank Research Grant Dollars	Research Grant Dollars	Rank Research Dollars/ Faculty	Research Dollars/ Faculty	Rank Total Research Space	Research Space (sq. ft.)	Rank Research Dollars/ sq. ft.	Research Dollars/ sq. ft.	No. of Faculty
49	4,162,667	46	2,458,111	30	189,085	61	12,476	25	197	13
50	4,062,233	48	2,341,819	34	180,140	31	19,775	55	118	13
51	4,058,042	50	2,259,317	54	118,911	6	29,872	74	76	19
52	3,929,491	62	1,458,526	76	66,297	65	10,760	47	136	22
53	3,909,957	60	1,531,359	47	139,497	72	9,253	34	165	11
54	3,798,460	51	2,183,948	48	136,497	30	19,813	61	110	16
55	3,612,848	57	1,658,000	22	207,250	63	12,251	49	135	8
56	3,612,551	31	3,079,346	29	192,459	35	18,971	35	162	16
57	3,596,525	56	1,817,452	37	165,223	85	6,565	9	277	11
58	3,565,242	37	2,700,000	12	245,455	67	10,240	10	264	11
59	3,383,910	61	1,501,550	56	115,504	55	14,175	64	106	13
60	3,133,470	52	2,008,515	19	223,168	52	14,881	48	135	9
61	3,114,545	55	1,840,160	65	108,245	46	16,500	60	112	17
62	2,967,230	68	1,167,030	79	55,573	48	15,792	75	74	21
63	2,951,786	70	1,078,198	72	98,018	77	8,038	50	134	11
64	2,921,491	59	1,572,258	53	120,943	66	10,257	40	153	13
65	2,851,443	74	949,545	77	63,303	37	18,602	82	51	15
66	2,798,218	58	1,585,504	60	113,250	80	7,352	18	216	14
67	2,472,577	67	1,193,455	64	108,496	56	13,648	72	87	11
68	2,471,016	64	1,392,477	40	154,720	76	8,179	31	170	9
69	2,169,521	72	1,019,479	75	78,421	70	9,567	63	107	13
70	2,146,277	81	554,693	85	34,668	73	8,526	79	65	16
71	2,086,522	78	891,195	78	59,413	71	9,357	68	95	15
72	2,065,759	73	984,956	71	98,496	84	6,618	41	149	10
73	2,024,000	66	1,200,000	73	85,714	78	7,695	39	156	14
74	2,005,966	84	389,903	87	29,993	75	8,264	85	47	13
75	1,964,348	65	1,222,077	62	111,098	34	19,030	80	64	11
76	1,956,177	63	1,443,464	43	144,346	62	12,470	57	116	10
77	1,926,514	80	560,725	83	43,133	83	7,000	73	80	13
78	1,889,458	83	479,053	82	47,905	51	15,250	89	31	10
79	1,889,021	69	1,136,272	59	113,627	50	15,363	76	74	10
80	1,878,594	77	910,019	58	113,752	79	7,680	56	118	8
81	1,825,875	82	538,360	80	53,836	69	9,882	81	54	10
82	1,810,095	79	616,910	84	41,127	60	12,640	84	49	15
83	1,780,766	76	913,158	50	130,451	57	13,316	78	69	7
84	1,493,678	75	949,300	66	105,478	90	3,950	14	240	9
85	1,356,475	92	87,814	92	6,755	64	11,965	92	7	13
86	1,250,677	88	130,506	90	13,051	86	6,191	90	21	10
87	911,582	85	330,600	63	110,200	91	3,741	71	88	3
88	843,512	87	203,176	86	33,863	88	4,880	87	42	6
89	787,673	93	17,693	93	2,949	74	8,483	94	2	6
90	687,995	89	125,000	88	25,000	95	2,700	86	46	5
91	602,129	90	115,832	89	23,166	93	3,527	88	33	5
92	544,649	86	328,304	74	82,076	89	4,480	77	73	4
93	149,000	91	90,000	91	12,857	87	5,500	91	16	7
94	98,656	94	10,000	94	1,667	92	3,688	93	3	6
95	30,000	96	0	96	0	82	7,000	96	0	6
96	0	95	0	95	0	96	390	95	0	3

(continued from page 65)

Perhaps the most important boost to the discipline of physiology comes from a direction that might have seemed unlikely a decade ago: genetics. The advent of transgenic and knockout mice has put all of us in a position to wonder about the function of various gene products. However, in many cases it is the physiologist who is in the best position to assess this function at the level of the whole animal, the whole organ and the whole cell. The human genome project has only added fuel to the fire. Who will determine the role of “orphan genes”—those with a structure but no known function? We are most fortunate to be living in an era in which the geneticists are handing the molecular physiologist—on a silver platter—all manner of novel genes tantalizingly similar to some with which we are already familiar.

Most interesting of all is who the “molecular physiologist” has become. Not too long ago, many of us tended to think that physiological reductionism was linear, moving from the animal to the organ to the tissue to the cell to the molecule. But the molecular physiologist is no longer just the cell physiologist wishing to become more reductionistic. Today, the “molecular physiologist” is just as likely to be a whole animal or organ system physiologist who is closing the loop, so to speak, and asking how the molecule directly affects macroscopic function.

Perhaps the most important boost to the discipline of physiology comes from a direction that might have seemed unlikely a decade ago: genetics.

I think that, scientifically speaking, these are most exciting times. Closing the loop from the micro- to the macroscopic forces all physiologists to speak the same languages. It forces us all to be thinking at the level of the molecule, the cell, the tissue, the organ, and the whole animal. For the first time, the discipline of physiology has really become “integrative.”

Before leaving the topic of the discipline of physiology, I would like to leave you with one other thought. It goes without saying that the Human Genome Project is one of the most important and exciting developments in human biology in our lifetime. But what will become of the discipline of “human genomics” a decade from now when the human genome has been sequenced? It will no doubt be important to study genetic polymorphisms and correlate these with diseases. I also think that it will be important to sequence the genomes of other species, especially those threatened with extinction. However, I think that the truly exciting activity a decade from now will be to begin the incredibly complicated process of putting it (i.e., the human genome) all together and to understand not only how the individual molecules function, but

also how they interact to produce the functioning whole animal. It is rather sobering to consider that—at least in principle—each new transgenic or knockout mouse ought to be approached as if it were a new species.

Departments of Physiology

“...it was the worst of times ...”

Whereas my forecast for the discipline of physiology has little downside, my forecast for Departments of Physiology—at least those on medical campuses—is not so sanguine. Of course, no research department can survive if it cannot remain competitive for NIH grants. Fortunately, grant support should not be a major problem over the next few years. The problem may come from the administrations of our own schools. As we all know, in an effort to push forward the frontiers of science—and sometimes to avoid the appearance of being left behind—scientists often try to shift their own work in the direction of the latest trendy research. Administrators likewise tend to follow the latest trends in education and departmental administration. The trends are toward the problem-based learning (PBL) approach for teaching medical students and toward the merging of various basic science departments.

Teaching. I must confess that I am not a believer in PBL. At Yale, we supplement traditional lectures with weekly 90-minute sessions in which we discuss clinical cases (i.e., “problems”) from a physiological perspective. This approach is very popular among the students. Even more important, it is sound. I worry that a curriculum 100% dependent on PBL will let important concepts fall through the cracks. I also am concerned that administrators sometimes put greater emphasis on whether the students “feel good” than on whether they are learning well. In the end, what makes students feel most “good” is good teaching. The conventional wisdom among educators who are actually doing the teaching is that almost any change in the curriculum will initially produce good results, mainly because change, per se, increases faculty enthusiasm. Conventional wisdom also says that as the novelty wears off, so will faculty enthusiasm. The challenge is not to change the curriculum for the sake of change or trendiness but to institute policies that make it easier and more desirable for the faculty to teach well.

Regarding interdisciplinary approaches to education, I think that these are healthy. However, it is impossible to be interdisciplinary if there are no longer any disciplines, which brings us to my next point.

Merging departments. The main reason I hear for merging basic science departments is that, as far as the administration can tell, these departments all basically do the same thing. We all use words like “cells” or “molecular biology,” or “signal transduction,” and we all use instruments like balances, pH meters, and PCR machines. There you have it; we are all the same! I believe that the onus is on all basic scien-

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tists, not just physiologists, to educate administrators, who are often not basic scientists, and who often have little recent involvement with teaching or research. We need to tell the administration that disciplines like physiology and cell biology and biochemistry—even when they happen to be attacking the same problem—approach the problem from different perspectives, with different philosophies, and often using different tools. Moreover, these pluralistic approaches will yield a complementary series of results that, together, will tell a complete story. Personally, I think it is just as tragic to see a pharmacology department merge with a biochemistry department as it is to see a physiology department suffer the same fate. In the end the results are the same: we all lose the richness of diverse disciplines, and we, as basic scientists, have less representation with the administration (i.e., the ratio of basic-science chairs to basic scientists decreases). When a physiology department disappears, it is also a tragedy for physiologists in clinical departments, because these scientists lose what should be the organizational center of their discipline on campus.

What else can we do besides educate the administrators? First and foremost, departments of physiology in medical schools should make themselves indispensable for teaching. In the final analysis, teaching is the *raison d'être* of a physiology department. For medical school physiology departments that are part of a university with an undergraduate campus, I make a more aggressive suggestion: consider establishing physiology as an undergraduate major. Just as there are trends on medical campuses, there are trends on undergraduate campuses. One of these seems to be that biology departments are increasingly focusing—or even splitting themselves into—the extremes of traditional biology: molecular and cell biology at the one extreme, and evolutionary biology and ecology at the other. When such a splitting takes place, it abandons the middle ground. It cedes the function of cells and organs to physiology, if physiology is there to pick up the ball. The “market” for the middle ground is potentially substantial and includes not only a certain fraction of traditional biology majors, but also pre-medical students. By establishing itself strongly on the undergraduate campus, a physiology department is less likely to suffer from the whims of the medical school administration.

In closing, I would like APS to continue to give its enthusiastic support to departments of physiology, both on medical and other campuses. I am encouraged by the strong ties between the APS and the Association of Chairs of Departments of Physiology.

The American Physiological Society

“... it was the spring of hope ...”

In many ways, the Society is in an enviable position. For example, our journals are structurally solid. We have entered

the age of electronic publishing at an aggressive but responsible pace. Members already have on-line access to all Society journals for the nominal annual fee of \$49.50, and, as of July 1, 1999, will be able to publish color figures for free. Moreover, we are launching a new journal, *Physiological Genomics*, which has the potential of capturing an exciting new area of physiology.

The annual spring meeting is steadily improving, driven mainly by the sections and a host of innovations, including the Distinguished Lecturer Series. Society membership, a key project of current President Gabriel Navar, has increased 17% over the past five years. APS is in excellent organizational shape, thanks to the efforts of Marty Frank and a dedicated group of professionals in Bethesda. Moreover, with an endowment in excess of \$30 million, we have the financial strength to make bold new initiatives.

First and foremost, departments of physiology in medical schools should make themselves indispensable for teaching. In the final analysis, teaching is the *raison d'être* of a physiology department.

Ten years ago, the Society's affiliation with FASEB was suspect. Today, as a founding member of FASEB, we can be proud that this interdisciplinary organization has become a major force in successfully bringing to Congress the case for biomedical research. Moreover, our leadership in FASEB has helped draw other societies to FASEB.

In spite of all these positives, we face some very real challenges. Our two major tasks as a society are journals and meetings. In addition, we play a major role, via FASEB, in influencing the NIH agenda. APS not only must serve its members, it also supports numerous outreach programs. Finally, the Society must plan how to invest its financial assets most wisely. I will now address each of these items in turn.

Journals. Brenda Rauner, her APS staff, as well as former Publications Committee Chair Leonard R. “Rusty” Johnson and current chair Dale Benos and the Publications Committee, have been doing outstanding jobs managing the Society's journals. As I see it, our major challenge for the future is not administration of the journals, but the real and perceived quality of the publications. One can always argue that impact factors are not the ultimate test of a journal's quality. Moreover, some of the sections of *American Journal of Physiology* are doing quite well, as judged by ad hoc assessments of impact factors. However, I am disappointed that,

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overall, the impact factors of our research journals are not closer to those of the *Journal of General Physiology* and *Journal of Physiology*. Because impact factor is one of the variables that an author assesses in choosing the journal, it is unlikely that we can turn around our impact factors over

As I see it, our major challenge for the future is not administration of the journals but the real and perceived quality of the publications.

night. Nevertheless, we must begin thinking of creative ways to enhance the quality of our journals. Our long-term goal should be to elevate the impact factors of all of our journals so that, for example, the consolidated *American Journal of Physiology* is at the level of *Journal of General Physiology*.

Another major challenge, certainly the most exciting one, is the launching of our new journal, *Physiological Genomics*, the brainchild of Past President Allen Cowley. Launching this journal will require a tremendous effort from a purely management point of view (i.e., ensuring an adequate number of quality submissions). It is also a major financial risk for the Society. However, the risk is well worth taking, given the visionary nature of this project. To maximize the success of *Physiological Genomics*, we will all have to do our parts by doing word-of-mouth advertising, by convincing our colleagues to publish there, and by publishing there ourselves.

A challenge facing all biological journals is financial survival in a world of electronic publishing. The Publications Committee, the APS Council, and the professional APS staff have done an excellent job in positioning the Society so that we are likely to do well. Nevertheless, we will have to be constantly vigilant as this new electronic world unfolds. The Society must continue to ensure that the pricing structure of the journals is compatible with their continued financial survival.

As noted above, APS members already may have unlimited access to the electronic versions of our journals for \$49.50. In the future, I would hope that we could include this service in our membership fee. I believe that no APS journal should be too expensive for any member. I would like to go on record to say that I am one of those old-fashioned types who would hate to see the print versions of the journal ever disappear. Some people still prefer to hold the written words in their hands. Moreover, I think that it is important that archival copies exist.

I have one last wish in the area of publications. I would like the APS to gradually extend our on-line coverage of journals backwards in time, so that we can electronically access older papers. One of my major reasons for taking this stance is that I think that younger scientists sometimes believe that science started with the on-line coverage of science. History is impor-

tant. Research done many years ago may very well be “current” in the best sense of the word. It would be a shame if scientists of the future were unaware of work done in the pre-electronic age and made the mistake of either unknowingly repeating the research or designing experiments that violate principles established by this older work.

Before leaving publications, I would like to acknowledge the outstanding work of Brenda Rauner, the APS Publications Manager, who will be retiring at the close of the spring meeting. In my capacity as Editor of *Physiological Reviews*, I have been privileged to work closely with Brenda. I regard her as a very dear friend, as well as a most worthy opponent on the tennis court. As I noted above, we owe much of the success of our journals to Brenda’s expert and tireless efforts. We will miss her.

Annual meeting. The annual Spring meeting, held in conjunction with other FASEB societies, ought to be the highlight of the APS year. However, there is little doubt that the annual meeting is not quite the centerpiece of members’ activities that it was in previous generations. One reason is the explosion of specialty societies, and their meetings, which directly compete with the program generated by the APS sections. Another reason, perhaps, is that the APS and FASEB had not kept pace with innovations in meeting style that helped make the specialty-society meetings successful.

In 1997, Allen Cowley convened a Blue-Ribbon Panel to discuss APS meetings and to make specific recommendations. The APS Council has already implemented many of their suggestions. In particular, there has been a major reorganization of the Program Committee and the way it does business. In the old system, the APS sections—acting as an advisory committee—proposed a program that was then submitted for approval to the Program Committee. In the new system, the sectional representatives now sit on the Program Committee, directly controlling the programming. Moreover, each section receives a predetermined number of slots, and the section—not the Program Committee—decides how best to use them. Council has ensured that sections, as necessary, reorganize their leadership structure so that there are adequate numbers of outstanding scientists involved in sectional programming and so that there is adequate continuity over the years. Under the leadership of Judith Neubauer, the Program Committee now includes—besides the Sectional representatives—individuals selected by the APS Presidents, individuals whose scientific expertise reflects how we would like our meeting to become.

The Program Committee now meets face-to-face in January to program abstracts for the upcoming April EB meeting. The Committee meets again during the EB meeting to sketch out plans for the following year. Previously, the plans for the following year were set in stone 12 months in advance. Finally, the Program Committee meets in June to finalize plans for next year’s EB meeting, giving the Society an unprecedented

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degree of flexibility. It is now possible to submit "late-breaking" abstracts in late February, less than two months before the EB meeting. This year the APS will program 95 late-breaking abstracts. Moreover, Council and the APS staff are making many structural changes to the meetings to ensure that the atmosphere is fresh and vigorous and that the scheduling of posters, platform presentations, and symposia are well organized. One change, for example, is that all abstracts will be presented as posters, and from these will be selected a group that will be also be presented in oral sessions.

Although the EB meeting is in every sense the Society's own meeting, the participation of other societies enhances the attractiveness of the EB meetings for three reasons. First, these other societies often sponsor symposia or oral/poster sessions that are of interest to APS members. Second, APS members have the opportunity to interact scientifically and socially with members of these other societies. Third, the presence of multiple societies makes it possible to attract exhibitors to the meeting and, thus, make the EB meeting an occasion for doing scientific "window shopping." It is my

Introducing . . . Walter F. Boron

Walter F. Boron will be installed as the 72nd President of The American Physiological Society at the Society's spring meeting this month in Washington, DC.

Boron is Professor of the Department of Cellular and Molecular Physiology at the Yale University School of Medicine in New Haven, CT, where he has served since his appointment in 1980. He was born in 1949 in Elyria, OH, where he received his education through high school. He attended Saint Louis University, where he earned an *AB summa cum laude* in chemistry in 1971. Boron then entered the Medical Scientist Training Program at Washington University in St. Louis, where he did his graduate work under the tutelage of Albert Roos in the Department of Physiology and Biophysics. He received his MD and PhD degrees in 1977. After remaining with Roos for one year as a postdoctoral fellow, Boron moved to Yale in 1978 to work as a postdoctoral fellow with Emile Boulpaep in the Department of Physiology. In 1980, Boron joined the faculty of that department. He was promoted to Associate Professor in 1984 and Professor in 1987. Between 1989 and 1998, he served three 3-year terms as Chairman of the Department.

As a graduate student, using microelectrodes to measure intracellular pH (pH_i) in squid axons and barnacle muscle fibers, Boron was one of the first to monitor transient changes in pH_i . With Paul De Weer, Boron observed and elucidated the pH_i changes caused by applying and withdrawing $\text{NH}_3/\text{NH}_4^+$ and $\text{CO}_2/\text{HCO}_3^-$. They thereby introduced the NH_4^+ prepulse technique that is still widely used to acid load cells and also produced the first direct evidence of active pH_i regulation. Their work, and the work that Boron did with John Russell, was pivotal in the initial description of the Na^+ -driven $\text{Cl}^-/\text{HCO}_3^-$ exchanger. As a postdoctoral fellow, Boron, together with Boulpaep, discovered the electrogenic Na/HCO_3^- cotransporter, which plays a central role in HCO_3^- reabsorption in the renal proximal tubule. Boron's group at Yale has continued to elucidate mechanisms of pH_i regulation and acid-base transport. They were among the pioneers in using pH-sensitive dyes for monitoring pH_i and also developed a rapid-mixing technique for making out-of-equilibrium

$\text{CO}_2/\text{HCO}_3^-$ solutions with virtually any combination of $[\text{CO}_2]$, $[\text{HCO}_3^-]$, and pH. They developed techniques for determining how growth factors affect the pH_i dependence of acid-base transporters. By doing experiments in the presence of HCO_3^- , they disproved the theory that growth factors act by raising pH_i . The Boron group also discovered the K/HCO_3^- cotransporter and cloned the electrogenic Na/HCO_3^- cotransporter and, more recently, the electroneutral Na/HCO_3^- cotransporter. Their work on isolated-perfused gastric glands and colonic crypts led to the discovery of gas-impermeable membranes. Most recently, Boron's group has shown that water channels, such as AQP1, have a high permeability for CO_2 gas.

Boron has been an active member of APS since 1981, serving as Councillor for the Society for three years. He has been a member of the Long-Range Planning Committee. He served as program representative and later as Chair of the Renal Section. He served for six years as Associate Editor of *Physiological Reviews* and is currently in his sixth year as Editor of that journal. He was treasurer of the Society of General Physiologists and has served on the editorial boards of the *American Journal of Physiology: Renal, Fluid and Electrolyte Physiology*, and *The Journal of Physiology*.

Boron was a Searle Scholar from 1981-1984. He won the Young Investigator Award of the American Society of Nephrology and the American Heart Association in 1986. For excellence in teaching at Yale, Boron received the Charles W. Bohmfalk Teaching Award in 1993. That same year, he received the Robert F. Pitts Lectureship Award from the Renal Commission of the International Union of Physiological Sciences. In 1998, he received the C. W. Gottschalk Distinguished Lectureship Award from the Renal Section of the American Physiological Society. He was also elected a Fellow of the American Association for the Advancement of Science in 1998. Boron's research is funded by the National Institutes of Health. He and Emile Boulpaep are completing the editing of a new textbook of physiology for first-year medical students.

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hope that additional societies will be attracted to the EB meeting. Already, numerous guest societies have begun to meet under the umbrella of the EB meeting. Of special interest to the APS, these include Microcirculatory Society, North American Vascular Biology Organization, Biomedical Engineering Society, Society for Experimental Biology and Medicine, American Federation for Medical Research, and North American Society for Biorheology.

NIH Funding. APS, acting with FASEB, must continue its efforts with Congress and the American public for continued increases in the NIH budget. In the wake of our recent successes, we are beginning to hear questions, both from scientists and Congress, about whether NIH can wisely spend its new funds. My reply is a resounding “yes”! At least we should be able to spend the monies wisely.

I very much appreciate the enthusiastic support of Congress and other advocates for the NIH. Is the public behind us? I think so.

My *second-biggest* fear is that special interests inside and outside of the NIH will use its perceived largess to create a range of new, interesting and costly, but not vital, programs. My *biggest* fear is that the next time there is a Federal budget crisis, these new NIH programs will be maintained, to whatever degree, at the expense of the key NIH mission: investigator-initiated grants and training grants. The only new programs that the NIH should be seriously considering at the present time are those that deal with the renewal of the scientific infrastructure, both buildings and equipment. Aside from such infrastructure renewal, I strongly believe that the NIH should not establish any major new programs before it can accomplish the following.

- The funding of grants for five years should become the norm, as it was several years ago.
- The NIH should eliminate across-the-board cuts and, instead, fund grants at the amounts recommended by the Study Sections. This was the policy when I received my first NIH grant as an assistant professor back in the early 1980s. My understanding is that, despite the massive increases in their budgets, most NIH Institutes continue to “downward negotiate” newly funded grants by as much as 15%. Assuming that NIH receives another double-digit funding increase, we should all be outraged if this “downward negotiation” policy continues into the next fiscal year.
- The NIH should fund grants, in rank order of their normalized percentile scores, to the 35th percentile. This was also the policy in the early 1980s.

The NIH points out that the “success rate” this year ought to be 34–38%. It is important to remember that the success rate is the sum of grants funded “in order” up to the cut-off,

which is often about the 25th percentile or less, plus grants funded out of order due to the decisions of NIH professionals and the NIH Councils. It is clear from the above figures that a very large proportion—I think an unreasonably high proportion—of NIH funding decisions (i.e., about 1/3) are not being made by the Study Sections. Personally, I would prefer to see the cut-off set at about the 40th percentile, with very little out-of-order funding.

Some in the NIH have indicated that science above the 30th percentile is not good enough to be funded. I beg to differ. Even in the early 1980s, applications that scored between the 30th and 40th percentiles were solid. It is important to remember that the dismal NIH funding situation during the past several years has seen the disappearance of many talented investigators from the cohort that would normally be applying for grants today. Those investigators who are still around today to apply for grants are a far more select group than 15 years ago! Thus, funding to the 40th percentile would still be funding excellent science. Moreover, it is impossible to predict from where the breakthroughs will come. Sometimes it may be from the grant whose score suffered somewhat because it was regarded as being too avant garde.

Is the public behind us? I think so. One of my pet projects is the Boronian survey of American attitudes towards medical research. When on a trip, I routinely ask taxi drivers, waitresses, hotel clerks—every one I meet—how much the Federal Government ought to be spending on disease-related research. As a fraction of the monies we spend on patient care, every single respondent replied “at least 5%,” citing that this is what industry often spends for research and development. Most were in the 10–20% range. Some generous souls, including my mother, were in the 100–200% range. All were appalled to learn that the real number is closer to 1%. I very much appreciate the enthusiastic support of Congress and other advocates for the NIH. Is the public behind us? I think so.

One last word on Federal funding for science. In our efforts to ensure that NIH is optimally funded, let us not abandon our scientific brethren in other disciplines. I am strongly in favor of major increases in funding for the NSF. Moreover, I very much want to see the US maintain its strength in space exploration. I think that the APS should be pro-science.

Endowment. One of the Society’s greatest assets, literally, is its endowment of \$30 million. The APS accumulated these funds over the years as the result of gifts, profits on its journals, and wise investments. In fact, one of the reasons that the endowment is so large is that, for many years, the APS spent only a tiny fraction of the annual return on its investments. A major change occurred in 1992 when a Council Strategic Planning Retreat was held in response to Norman Alpert’s refrain that the Society ought not to die rich, but rather spend more of its funds on bold new programs. Even though spending on new initiatives increased, the available funds were only

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the relatively meager amounts derived from interest on money market-type investments. In particular, the substantial returns on our stock portfolio were off limits. A crisis occurred in 1995, during my first year on Council, when a projected shortfall in the Society's budget prompted a call to Council for major cuts in APS programs, including some of the programs newly initiated as a result of the Society's strategic planning efforts.

The solution to the 1995 budget crisis was to adopt the 4% spending rule that I put on the table. Council agreed to treat the bulk of APS assets as an "endowment" and to put into its general budget a fixed percentage (currently 4%) of this endowment. Of course, this proposal was not a very creative solution: it is the way most universities handle their endowments. Nevertheless, 4% spending rule solved the immediate crisis and has put the Society solidly in the black ever since. As far as finances are concerned, the major problem for the Society now is to spend the endowment investment income wisely. For the truth is, we are currently spending less than half of the \$1.2 million allocated by the 4% spending rule!

Before discussing how we might wisely invest our capital, I would like to take a brief look at where our endowment may very well go over the next several decades. Our endowment is largely in the hands of money managers who are asked to produce returns of 5% over inflation. In fact, since 1988, the average annual return has been ~14%, over a period when inflation has been ~3%. Thus, our money managers have done an outstanding job. If present trends continue—spending 4% of the endowment yearly, inflation at 3% per year and an annual return on investment of 14%—our real dollars will grow at an annual rate of $14 - 3 - 4 = 7\%$. In other words, the principal of our endowment, in real dollars, will double every ten years! Thus, in 2010, our endowment would be ~\$60 million; in 2020, when I would be 70 years old, ~\$120 million; in 2030, when some of the fellows in my laboratory would still be only 60 years old, nearly a quarter of a billion 1999 dollars!

My strong advice to the Society is to maintain our current investment practices and to continue spending 4%, or at most 5%, of our endowment annually. Following this philosophy, the disposable funds provided by our endowment would —

making the assumptions outlined above—double every ten years. How will we spend that money wisely? Our current \$1.2 million endowment income, of which well over \$600,000 is going unspent, would allow us to enhance Society programs greatly. Moreover, an exponential increase in endowment income will gradually put the Society in a position to expand or initiate programs exponentially. One could make a long list of ways that we could spend this expanding income. I invite members with suggestions to bring these to me or other members of Council, or to Marty Frank and the APS staff. This fall, Council will be convening a Strategic Planning Retreat in Kiawah Island, South Carolina, to consider, among other issues, how to wisely invest the annual income provided by our endowment. Some of the possible programs on my list are:

- Make the electronic versions of APS journals free to APS members.
- Eliminate page charges for APS members who publish in APS journals.
- Provide 100 free reprints for a paper published by an APS member in an APS journal.
- Increase the number of APS postdoctoral fellowships (currently two 2-year fellowships), especially for foreigners, who are not eligible for NIH fellowships, and increase the number of predoctoral fellowships (currently 7) for minority students under the Porter Physiology Development Program.
- Increase the number of research start-up grants for new investigators (currently two Giles F. Filley Memorial Awards, one Arthur C. Guyton Award in Integrative Physiology, and one Shih-Chun Wang Young Investigator Award).
- Fund APS "outreach" programs (e.g., Frontiers in Physiology) for high-school teachers from APS funds. The APS generally initiates such programs with Federal funds, which are often limited to start-up programs.

Implementing all of these ideas would spend our present endowment income many times over. However, with a real income that may double every ten years, we are in the position to create a timeline for programs we would like to expand or create. I look forward to such a creative timeline, and I look forward to seeing it implemented. This indeed could be an exciting time for the Society. ❖

New Editor Appointed for the *Journal of Applied Physiology*

The Publications Committee is pleased to announce that Gary C. Sieck has been appointed to the editorship of the *Journal of Applied Physiology*; his term will begin on July 1,

1999. John Remmers, current editor, will complete his six-year term on June 30, 1999. "Introducing Gary Sieck..." will appear in the June issue of *The Physiologist*. ❖

APS Election Results

Gerald F. DiBona, Department of Internal Medicine and Physiology, University of Iowa, is the new President-Elect.

The three newly elected Councillors taking office on April 21, 1999 are **Hannah V. Carey**, University of Wisconsin,

Jo Rae Wright, Duke University Medical School, and **William W. Chin**, Harvard Medical School. Carey and Wright will serve for three years, and Chin will serve for two years, completing the term of Ethan Nadel. ❖

President-Elect



Gerald F. DiBona



Hannah V. Carey



Jo Rae Wright



William W. Chin

Councillors

Schultz Selected as Recipient of 1999 Arthur C. Guyton Physiology Teacher of the Year Award

Stanley G. Schultz, a Professor in the Department of Integrative Biology at the University of Texas Medical School, Houston, TX, has been selected as the 1999 Arthur C. Guyton Physiology Teacher of the Year. The award, now in its seventh year, is given for documented excellence in teaching both in and out of the classroom and for a demonstrated commitment of physiology education. W.B. Saunders Company sponsors the award, which consists of a plaque, a cash award of \$1,000, and funds to defray some of the expenses for attending the meeting.

Schultz's award will be presented at EB '99 in Washington, DC, in conjunction with his talk on "Remembrance of Things Past and Concerns for the Future." The ceremony will be held on Monday, April 19 at 7:00 PM in



Stanley G. Schultz

Independence F/G of the Washington Grand Hyatt Hotel.

Schultz, a former Chair of the Department of Physiology at the University of Texas Medical School in Houston, is also a Past-President of APS and a previous presenter of the Claude Bernard Distinguished Lecture. In addition to his pioneering work in cell membrane transport, Schultz is an award-winning teacher and strong advocate for physiology education. His talk promises to serve as a highlight for the Teaching of Physiology Section's activities during the meeting.

APS extends an invitation to all to attend the 1999 Guyton Physiology Teacher of the Year Award presentation and thanks the W.B. Saunders Company for its continuing support of the award. ❖

A Matter of Opinion

Kiwi Magic

Out beyond where most of us have traveled lies a simply remarkable country, surrounded by water and offering the best in outdoor adventure. The country is New Zealand, and, as physiologists, we will have the opportunity to explore it in 2001 in conjunction with the 34th International Congress of Physiological Sciences. Christchurch, the garden city of New Zealand, will serve as the host city for the Congress.

The Organizing Committee, led by Anthony D. C. Macknight, is working to make your visit truly memorable. Pre-Congress sport and recreation programs will help you to recover from your long flight from the US or Europe. After all it is a 12.5 hours flight from Los Angeles to Auckland on the North Island of New Zealand. Once you have adjusted to the time zone, you will be primed to participate in the 34th IUPS Congress titled "From Molecule to Malady," which will take us on a physiological journey from the bench to the bedside. The Congress will feature 12 Synthesia each day, a new session format designed to focus on new ideas, present concepts rather than data, and provoke debate through presentations that are provocative, controversial, integrative, and intellectually stimulating. In addition, there will be a series of plenary lectures and ample opportunity for the presentation of abstracts as free communication. The Congress will also be coordinating registration and scientific sessions with the 40-50 satellite meetings scheduled before and after the meeting in venues throughout New Zealand and Australia. Stay tuned to *The Physiologist* and to the Congress web site <http://www.iups2001.org.nz> to learn more about the scientific program.

However, it is not my purpose to tell you about the program. Tony Macknight and the Organizing Committee will be providing information at Booth #1044 at the Experimental Biology meeting. I want to tell you that the Congress will provide you with the unique opportunity to see an area of the world most of us have never visited. I had the opportunity to explore the South Island in the middle of February after meeting for several days with the Organizing Committee in Christchurch.

The city of Christchurch is wonderful. The convention center and the various meeting sites are more than adequate for a Congress of 4,000 participants. To top it all off, the various sites are all within a 15-minute walk. The hotels are also a



short walk away and offer the same amenities that you would find in any hotel in the United States, all at a reasonable price thanks to the current exchange rate of \$US 0.55 to \$NZ 1.00. For those unwilling to take a short walk, the city of Christchurch has a free bus that circles around the city core, touching the convention center and many of the meeting hotels. In the evening, there are cultural opportunities and numerous restaurants with a wide range of cuisines complemented by an excellent array of New Zealand wines.

If you come to the Congress, make sure you don't spend all your time in

Christchurch. Set aside some time to ski in the Southern Alps, play golf on the coastal plans, hike on the 5,000 miles of walking trails, or explore the 9,800 miles of coastline. After all, as good scientists, it is our responsibility to explore why New Zealand comes burdened with a reputation as a unique land. Is it because New Zealand is packed with magnificent raw scenery, craggy coastlines, sweeping beaches, primeval forests, snow-capped alpine mountains, bubbling volcanic pools, fast flowing rivers and glacier-fed lakes? The IUPS Congress will provide you with an opportunity to answer the question for yourself.

If you rent a car, remember that you will be driving on the left-hand side of the road. Really, that wouldn't be too difficult to get used to if you were driving on a four-lane divided highway. Unfortunately, in the 950 miles (oops, kilometres) that I drove around the South Island, I encountered only 15 kilometres of divided highway. Most of the roads are narrow and winding, whether through mountain passes or fertile valleys. Fortunately, the traffic was extremely light, which probably saved me from an accident but increased my anxiety levels considerably. After all, who would find me if I drove off the road while trying to take in the breathtaking views of mountains and valleys and craggy coastlines. For long stretches of road, the only living creatures that I saw were the flocks of sheep. Fortunately, I was able to reduce my anxiety levels in the evenings by sampling New Zealand's excellent wines and local beers.

So get ready for the 34th IUPS Congress. Come to New Zealand for the science but also come because the Congress will provide you with the unique opportunity to explore down under. ♦

G'day,
Martin Frank

Membership

New Affiliate Members

Khandaker Abu Taher

Tulane Medical School

Robert Birmingham

University of Connecticut

Akram Ghariani

WTC, Inc., Houston, TX

William Whitmore Tammone

Montcalm Community College

New Student Members

Hamda Abdulla Al-Naemi

University of Arizona

Alejandra Acevedo

Genesis Associates

Robert Andrew Augustyniak

Wayne State University

Wende Ruth Beenstra

Boston University

Earl Benjamin III

Delaware State University

Peeyush Bhargava

Virginia Commonwealth University

John B. Callahan

University of Pittsburgh

Jinah Choi

University of California-Los Angeles

Paul William Conrad

University of Cincinnati

Selina Faith Darling-Reed

Florida A&M University

Jodi Beth Dickstein

University of Toronto

Gayle Louise Ecker

University of Guelph

James Langdon Eubanks

University of Washington

Rachel M. Freed

Stanford University

Olivier Frenette

Laval University

Smita Garde

University of Southern California

Simon Paul Grudzien

University of Guelph

Jason J. Hamann

Auburn University

Christian John Hunter

Loma Linda University

Jeanne Deborah Johnston

Indiana University

Stacy Jones

Oklahoma University

Arzu Karabay

Virginia Polytechnic Institute

Kenneth Charles Kepler

University of Florida

Soo-Jin Lee

Barnard College

Shonda Lipskie

University of Guelph

Warren Carl McClure

University of Texas-Houston

Joshua Miller

Florida Atlantic University

Julia Ann Moffitt

University of Missouri

Zaher Ahmad Nahle

SUNY-Stony Brook

Michael James Nuttall II

Michigan State University

Monica Elizabeth Olchawa

Michigan State University

Michael Scott Osmanski

University of Scranton

Shanthala Padar

University of the Pacific

Kendall Sue Powell

University of California-San Diego

Paxton Everett Provitera

SUNY-Stony Brook

John C. Quindry

East Tennessee State University

Vinoth Kumar Raganathan

Cleveland Clinic Foundation

Alexandra Meeks Rankin

University of Minnesota

Matthew L. Rickett

Texas A&M University

David Alan Silverstein

Michigan State University

Shawn Edward Soutiere

Johns Hopkins University

Kyrsten N. Spann

University of California-Santa Cruz

Salome A. Thomas

SUNY-Buffalo

Jason Juan Villarin

Northern Arizona University

Edward A. Westen

Indiana University

Jauchia Wu

Yale University

Deceased Members

Peggy L. Barrington

University of Illinois College of Medicine

Paul Kezdi

Wright University Medical School

Charles D. Kochakian

University of Alabama Medical Center

Paul G. LeFevre

SUNY-Stony Brook

Conferences

Biology of Potassium Channels: From Molecules to Disease

1999 APS CONFERENCE

September 22-25, 1999

Snowmass Resort, Snowmass Village, Colorado

ORGANIZERS:

Steven Hebert, Vanderbilt University

Gerhard Giebisch, Yale University

STEERING COMMITTEE:

Richard Aldrich, Stanford University

David Clapham, Children's Hospital/Harvard Med. School

Lily Jan, University of California, San Francisco

Olaf Pongs, Institut für Neuronale Signalverarbeitung

Frances Ashcroft, Oxford University

Fred Sigworth, Yale University

Lawrence Palmer, Cornell University

PURPOSE: This meeting on the broad topic of K channels will promote dissemination of current and evolving information/trends as well as foster potential interactions among attendees. Focus will be on gating/regulatory and structural/genetic elements of K channels. The involvement of K channels in several inherited diseases will be stressed.

WEDNESDAY, SEPTEMBER 22, 1999

State-of-the-Art Address: Structure of the Potassium Channel Pore

Speaker: Fred Sigworth, Yale Univ.

THURSDAY, SEPTEMBER 23, 1999

State-of-the-Art Address: High Conductance Ca-Activated Potassium Channels: Structure, Function and Pharmacology;

Speaker: Gregory Kaczorowski, Merck Research Laboratories

Session 1: K Channel Gating

Chairs: Clay Armstrong, Univ. of Pennsylvania,

Fred Sigworth, Yale Univ.

Speakers: Francisco Bezanilla, UCLA; Richard Aldrich,

Stanford Univ.; Colin Nichols, Washington Univ.;

David Clapham, Harvard Medical School

Session 2: The Channel Pore

Chairs: Henry Sackin, Chicago Medical School,

Gary Yellen, Harvard Univ.

Speakers: Benoit Roux, Univ. of Montreal; Hans Oberleitner,

Univ. Münster, Germany; Robert Guy, NIH

State-of-the-Art Address: ATP-Sensitive K Channels: Structure, Pharmacology and Function

Speaker: Frances Ashcroft, Oxford Univ.

FRIDAY, SEPTEMBER 24, 1999

State-of-the-Art Address: The Inward Rectifier K Channel Family

Speaker: Lily Jan, UCSF

Session 3: K Channel Associated Protein

Chairs: Rainer Greger, Univ. of Freiburg, Germany,

Lydia Bryan, Baylor Univ.

Speakers: Lydia Bryan, Baylor Univ., Min Li, Johns Hopkins

Univ., Arthur Brown, Case Western Reserve Univ.,

David Brecht, UCSF; Joseph Bryan, Baylor Univ.

Session 4: Assembly of K Channels

Chair: Lily Jan, UCSF

Speakers: James Trimmer, SUNY at Stony Brook;

Diane Papazian, UCLA; Senyon Choe, Salk Institute;

Raymon Latorre, CECS in Santiago, Chile

Session 5: Channel Regulation

Chairs: Wen-Hui Wang, Yale Univ.;

J. Peter Ruppersberg, Institute of Physiology, Tübingen, Germany

Speakers: Lawrence Palmer, Cornell Univ.; Steven Hebert,

Vanderbilt Univ.; Donald Hilgemann, Univ. of Texas, Southwestern.

SATURDAY, SEPTEMBER 25, 1999

State-of-the-Art Address: Knockout/Transgenic Models of Potassium Channel Function

Speaker: Olaf Pongs, Center for Molecular Neurobiology, Hamburg

Session 6: K Channels and Inherited Diseases

Chairs: David Clapham, Harvard Univ., Michael Bienkowski, Pharmacia and Upjohn

Speakers: Lydia Bryan, Baylor Univ.; Gerda Breitwieser,

Johns Hopkins Univ.; Michael Sanquinetti, Univ. of Utah;

Richard Lifton, Yale Univ.

Session 7: Other K Channels

Chairs: Walter Stühmer, Max-Planck Institute, Gary Desir, Yale Univ.

Speakers: Herve Sentenac, INRA Argo Montpellier, France;

Lawrence Salkoff, Washington Univ.; Michael Lazdunski,

Univ. Nice, France; John Adelman, Oregon Hlth Sci Univ.;

Steve Goldstein, Yale Univ.; Nicholas Standen,

Univ. of Leicester, UK.

DEADLINES

Abstract Deadline - June 1, 1999

Advance Registration Deadline - August 2, 1999

Conferences

Determinants of Vigilance: Interaction Between the Sleep and Circadian Systems

1999 APS CONFERENCE

October 19-22, 1999

Radisson Bahia Mar Beach Resort, Ft. Lauderdale, Florida

ORGANIZER:

Allan Pack, University of Pennsylvania

STEERING COMMITTEE:

David Dinges, University of Pennsylvania

H. Craig Heller, Stanford University

Leszek Kubin, University of Pennsylvania

Adrian Morrison, University of Pennsylvania

Amita Sehgal, University of Pennsylvania

Robert Moore, University of Pittsburgh

Fred Turek, Northwestern University

Jerry Siegel, University of California, Los Angeles

PURPOSE: This meeting will explore the quantitative nature of the interaction of circadian biology and basic mechanisms of sleep and new potential areas of scientific opportunity. We will examine the neuroanatomical evidence of direct connections between neurons involved in the circadian clock and those involved in the sleep/wake cycle. There will be presentations about how the circadian system affects neuroendocrine function and how such neurohormones might affect sleep. We will address whether the interaction between the circadian and sleep system could occur at the level of regulation of gene transcription.

TUESDAY, OCTOBER 19, 1999

Session 1: Evidence for Interaction Between Sleep and Circadian Systems

Chair: Robert Moore, Univ. of Pittsburgh

Speakers: Charles Czeisler, Harvard Univ.; Irene Tobler, Univ. of Zurich; Dale Edgar, Stanford Univ.; H. Craig Heller, Stanford Univ.

Session 2: Molecular Basis of the Circadian Clock

Chair: Fred Turek, Northwestern Univ.

Speakers: Amita Sehgal, Univ. of Pennsylvania; Larry Pinto, Northwestern University; Steven Reppert, Massachusetts General Hospital; Martha Gillette, Univ. of Illinois, Urbana.

WEDNESDAY, OCTOBER 20, 1999

Session 3: Mechanisms Controlling Sleep: Networks and Systems

Chair: Adrian Morrison, Univ. of Pennsylvania

Speakers: Robert McCarley, Harvard Univ.; Ronald Szymusiak, UCLA; Jerry Siegel, UCLA

Session 4: Sleep Promoting Factors

Chair: Alexander Borbely, Univ. of Zurich

Speakers: Osamu Hayaishi, Osaka Bioscience Institute; Robert Greene, Harvard Univ.; James Krueger, Univ. of Tennessee, Memphis

Session 5: Neuroanatomical Basis of Interaction

Chair: Gene Block, Univ. of Virginia, Charlottesville

Speakers: Robert Moore, Univ. of Pittsburgh; Clifford Saper, Harvard Univ.; Gary Aston-Jones, Univ. of Pennsylvania

Session 6: Could Interaction be Neurohormonal or Neurochemical?

Chair: Irene Tobler, Univ. of Zurich

Speakers: Alexander Borbely, Univ. of Zurich; Eve vanCauter, Univ. of Chicago; Rae Silver, Columbia Univ.

THURSDAY, OCTOBER 21, 1999

Session 7: Possible Molecular Mechanisms of Interaction

Chair: Steven Reppert, Massachusetts General Hospital/Harvard Univ.

Speakers: Allan Pack, Univ. of Pennsylvania; David Weaver, Harvard

Session 8: Consequences of the Interaction Between Circadian and Sleep Systems: Behavior and Vigilance

Chair: Michael Menaker, Univ. of Virginia, Charlottesville

Speakers: David Dinges, Univ. of Pennsylvania; Gregory Belenky, Walter Reed Army Institute of Research; Mary Carskadon, Brown Univ.

Session 9: Consequences of the Interaction Between Circadian and Sleep Systems: Other Systems

Chair: Charles Czeisler, Harvard Univ.

Speakers: Virend Somers, Univ. of Iowa; Janet Mullington, Harvard Univ.; Steven Shea, Harvard Univ.

Session 10: Panel Discussion: Where Do We Go From Here?

Chair: Allan Pack, Univ. of Pennsylvania

Speakers: Gary Aston-Jones, Univ. of Pennsylvania; Gene Block, Univ. of Virginia, Charlottesville; Michael Menaker, Univ. of Virginia, Charlottesville; Jerry Siegel, UCLA; Fred Turek, Northwestern Univ.

DEADLINES

Abstracts Deadline - July 16, 1999

Advance Registration Deadline - August 30, 1999

1999 Summer Research Teachers Named

APS Council has approved the 17 teams of teachers and researchers selected by the Review Committee to participate in the 1999 Frontiers in Physiology Science Teacher Summer Research Program. The Review Committee is comprised of the APS Education Committee and several former summer research teachers.

In addition, nine Montana middle and high school teachers and community college faculty have been awarded summer research fellowships in the Explorations in Biomedicine program. Explorations is a collaborative effort of

the APS and the American Indian Research Opportunities collaborative of Montana State University and tribal community colleges. The program offers summer research opportunities across the nation for middle and high school teachers and students from Montana Native American reservations and faculty at Montana tribal colleges.

Middle and high school teachers participating in the Frontiers and Explorations programs will receive a fellowship of up to \$5,850 to conduct physiology research for a seven- to nine-week period in the laboratory of an

APS member and to attend EB 2000 in San Diego, CA. Teachers will also attend a one-week summer retreat to learn how to develop hands-on, inquiry-based activities for their classrooms for publication by APS. Explorations teachers also receive a living allowance since they spend the summer research period away from their home state of Montana. For more information on the Frontiers program, see <http://www.faseb.org/aps/educatn/frontiers.html> and on the Explorations program, see <http://www.faseb.org/aps/educatn/explo rbi.html>. ❖

1998 SRT Winners

Teacher	Research Host	Teacher	Research Host
Mary Catherine Box Tahoka High School Tahoka, TX	Jean C. Strahlendorf Texas Tech University Health Sciences Center	Lynn M. Mills Hull High School Hull, MA	Steven Gullans Brigham and Women's Hospital & Harvard Medical School
Quiwani J. Cox Rivers Middle School Charleston, SC	Radhakrishna Rao Medical University of South Carolina	Carmen J. Nunez Francisco Zayas Santana Villalba, PR	Gregory J. Quirk Ponce School of Medicine Ponce, PR
William Franck Edmead The Washington Math Science Technology Public Charter High School Washington, DC	William Weglicki George Washington University Medical Center	Kenneth Pichot John Jay High School San Antonio, TX	Andrew Tsin The University of Texas at San Antonio
Thomas Montgomery Hinton Northwest Rankin High School Brandon, MS	Joey P. Granger University of Mississippi Medical Center	Melinda Pittis Lexington School for the Deaf Jackson Heights, NY Valhalla, NY	Thomas H. Hintze New York Medical College
Mary Garrett Hodges Don Julian Elementary La Puente, CA	Kenneth M. Baldwin University of California, Irvine	Sandra Sullivan Chosen Valley High School Chatfield, MN	Gary C. Sieck Mayo Clinic
Augusta Holmes Marta Valle Middle School New York, NY	Jason H. Mateika Teachers College, Columbia University	Ruth C. Wasserman Fort Mill High School Fort Mill, SC	Ralph A. Meyer, Jr. Carolinas Medical Center
Marcy Hotchkiss Lansdowne High School Baltimore, MD	Barbara Caleen Hansen University of Maryland Baltimore	Mark Edward West Arsenal Technical High School Indianapolis, IN	C. Subah Packer Indiana University School of Medicine
Victoria K. Kyarsgaard Johnson High School St. Paul, MN	Christine H. Wendt University of Minnesota	Mona Zarrinkell Pittsburg High School Pittsburg, CA	Peter Cala University of California, Davis
Anika M. Lynch Northwest High School Germantown, MD	Susan Mulroney Georgetown University School of Medicine		

Education

Explorations in Biomedicine 1999 SRT Winners (Research Hosts To Be Determined)

Barbara Arrowtop
Heart Butte School
Heart Butte, MT

Shane M. Doyle
Hardin Middle School
Hardin, MT

Carol H. Heath
St. Charles School
Pryor, MT

Kevin W. Kemp
St. Labre Indian School
Ashland, MT

Bob Madsen
Dull Knife Memorial College
Lame Deer, MT

Suzette M. Mule'
Brockton High School
Brockton, MT

Mike Peterson
Frazer Public School
Frazer, MT

Kaye E. Simons
Frazer School District
Frazer, MT

Theodora T. Weatherwax
Browning Middle School
Browning, MT

1999 Albert B. Sabin Heroes of Science Reception



APS Executive Director Martin Frank presents an award to Priscilla Mack, wife of Florida Senator Connie Mack (R), at the 1999 Albert B. Sabin Heroes of Science Reception, an event sponsored by the Americans for Medical Progress Educational Foundation.



1999 Albert B. Sabin Heroes of Science Award presenters and recipients: J. Calnan, T. Clarkson, J. Olds, N. Domenici, G. Burr, L. Flynn, D. Slamon, S. Lamb, B. Sills, M. Frank, B. Barrie, M. Bean, P. Mack, D. Colvin, and H. Sabin.

Special Pre-EB '99 Outreach Workshop for APS Members



My Health, My World

Certified Facilitators Training Workshop

Friday, April 16, 1999

Washington, DC

8:00 a.m. to 5:00 p.m.

My Health, My World provides multicomponent environmental health sciences curriculum materials and inservice workshops for Grades K-4. Components include: **Science adventure story books, Hands-on activity guides for teachers, and Mini-magazines for students. Certified facilitators are authorized to conduct workshops for teachers or students and are provided with:**

- free printed classroom materials, and
- hands-on equipment and supplies.

If you do outreach to elementary schools or classrooms, don't miss this workshop! For more information, see the web pages at <http://www.faseb.org/aps/educatn/mhmweb.html>

Funding provided by the National Institute of Environmental Health Sciences, APS, and Baylor College of Medicine.

☐ Yes! Sign me up for the FREE My Health My World Outreach Workshop at EB'99

Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Email _____

The workshop is free, but registration is limited. To register, complete and fax this form to:
Marsha Matyas, APS Education Office, fax (301) 571-8305.

PLEASE PRINT CLEARLY!



DEADLINE: April 9, 1999

USDA Extends Rats, Mice, and Birds Comments through May

USDA has extended until May 28 the comment deadline on a petition asking the agency to provide Animal Welfare Act (AWA) coverage for rats, mice, and birds.

APS will submit comments opposing this move. APS has a long-standing interest in promoting the welfare of laboratory animals. However, the vast majority of rats, mice, and birds already have the benefits of the humane care standards provided by the *Guide for the Care and Use of Laboratory Animals* so their inclusion under the AWA is not needed from an animal welfare perspective. New AWA regulations to cover these animals would interfere with the ability of the USDA's APHIS Animal Care staff to assure the welfare of its other animal charges and would burden researchers and research institutions with unnecessary paperwork.

APS comments on the proposal will be posted on the APS Public Affairs section of the APS web page at www.faseb.org/aps/pa/comment/usda.htm.

The *Federal Register* notice was published in the January 28 issue of the *Federal Register* with a 60-day comment period. It can be accessed by going to the USDA Animal Care web page under "News and Information" at <http://www.aphis.usda.gov/ac/info.html> and clicking on "AAVS Petition" under Current Issues. In the notice, USDA specifically asks for comments on the following questions:

- Should its definition of "animal" be expanded to include rats, mice, and birds?
- Should rats, mice, and birds be regulated in all circumstances?
- Should enforcement activities be equal for all species covered by the AWA?

On March 4, USDA published a second *Federal Register* notice extending the comment deadline until May 28. The National Association for Biomedical Research (NABR) had

asked for an extension in order to conduct a survey of its membership to assess the financial and administrative impacts of adding of rats, mice, and birds to the AWA. NABR will also seek information about how much the workload of USDA inspectors would

increase if they have to inspect rats, mice, and birds at its member institutions.

The driving force behind this activity is a petition from several organizations and individuals involved in animal protection and the promotion of alterna-

Canady Introduces Misnamed "Pet Safety" Bill Again

Rep. Charles Canady (R-FL) has for the third time introduced the misnamed "Pet Safety and Protection Act." While purporting to "ensure that all dogs and cats used by research facilities are obtained legally," H.R. 453 would actually interfere with the use of non-purpose bred dogs and cats in medical and veterinary research and education.

The background for H.R. 453 is what can best be called the "urban legend" that dogs and cats are routinely stolen and sold to research facilities. Although these allegations have never been proven, animal activists continue to use this as a rallying cry. They also disingenuously insist that ending the use of non-purpose animals will not hinder research.

H.R. 453 purports to safeguard family pets by eliminating the category of animal dealers currently licensed by USDA to supply non-purpose bred animals for research and education. This category of dealers, known as "Class B" licensees, was established to provide non-purpose bred to facilities unable to obtain them from local pounds.

H.R. 453 would also interfere with the other ways that researchers now obtain non-purpose bred animals. It would require pounds to register with the USDA before supplying animals to research facilities. Although not spelled out in the bill, it is likely that registration would mean that these pounds would have to undergo USDA inspections, file reports, and meet USDA animal care standards. Since those requirements would not apply to pounds that do not provide animals for

research, it would serve as a disincentive for them to continue to do so.

H.R. 453 would also halt voluntary donations of dogs and cats from privately-owned shelters and would restrict donations from individuals to animals that they have bred and raised or have owned for at least a year. In addition, the legislation would take effect after only three months. This lack of transition time could prove devastating to on-going research projects.

APS members should write to Rep. Canady to let him know that the H.R. 453 is not needed to protect pets and would in fact interfere with important biomedical research.

The 50,000 non-purpose bred dogs and cats needed for research is quite small in comparison to the 5-10 million unwanted animals destroyed by pounds and shelters each year. Researchers do not want to use pets in research. There is no reason why they would need to use pets in research, and they make every possible effort to be sure that lost pets do not end up in research projects. Nevertheless, the answer is not to switch to purpose-bred animals.

Some research in areas such as cardiovascular diseases and orthopedic problems requires dogs and cats that are relatively old, large in size, or that represent a specific population, such as animals with a particular disease or physiological trait or animals that represent a random gene pool without common traits. It would be difficult and expensive to purchase groups of animals meeting these criteria from a breeder, who typically sell young, genetically related animals from small

Public Affairs

tives to animal use. The petitioners, led by the Alternative Research and Development Foundation (an off-shoot of the American Anti-Vivisection Society), argued that USDA should have included rats, mice, and birds in its regulatory definition of "animal" under the 1970 amendments to the Animal Welfare Act. That law states that its pro-

breeds. However, animals with these kinds of traits can be readily found among the many unwanted animals that would otherwise be put to death in pounds. Non-purpose bred animals tend to be less expensive than those supplied by breeders so they may also be used for other kinds of medical and veterinary research as well as for teaching exercises for veterinary and medical students.

It should be pointed out that existing law has provisions to ensure that dogs and cats have been legally acquired, and that owners have time to reclaim lost animals. The Animal Welfare Act specifies that research institutions may obtain non-purpose bred dogs and cats only from certain sources, primarily from pounds and from USDA-licensed Class B dealers. Those dealers serve as middle men when local pounds are unable or unwilling to provide animals for research due to laws or policies advocated by self-styled animal protectionists. Class B dealers in turn may buy animals only from certain sources, which include pounds, individuals who have bred and raised the animals, and other licensed dealers. Dealers are required to keep records on each dog and cat they sell to research institutions, and they must hold the animals for about a week before transferring them to research facilities. The holding periods were instituted by law to give owners pets time to trace lost pets. Pounds are also required to hold animals for several days before selling them to dealers or research facilities.

When an earlier version of H.R. 453 was introduced in 1996, USDA's own inspections showed that many Class B

visions will apply to six named species (dogs, cats, nonhuman primates, guinea pigs, hamsters, and rabbits) and any "other such warm-blooded animal, as the Secretary [of Agriculture] may determine." The Secretary's discretionary authority has already been used to extend AWA coverage to wild-caught rodents and farm animals used in bio-

dealers failed to keep the required records that documenting the source of their animals. There was no direct evidence of pet theft, but it was impossible to verify that the animals had been legally acquired. Since then USDA has targeted its enforcement efforts on these dealers. Class B dealers with questionable record-keeping or animal care practices were subjected to quarterly inspections. These repeated inspections along with fines and enforcement actions including license revocations have led to dramatic improvements.

In 1993, there were 104 Class B dealers selling animals to research. As of 1998, only 37 remained. In USDA's most recent record audits, more than 90% of the animals could be traced back to their legitimate owners. Thus, existing law has proven adequate to ensure that stolen pets are not used in research.

It is important to let Rep. Canady know that H.R. 453 is based on serious misconceptions and that it would hinder research without protecting pets. Send your letter to Rep. Canady at the following address:

Rep. Charles Canady
2432 Rayburn House Office Building
U.S. House of Representatives
Washington, DC 20515

For further information about the legislation, a sample letter, and a list of the bill's cosponsors, contact APS Public Affairs Officer Alice Ra'anan (araan@aps.faseb.org) or visit the Thomas web server at the Library of Congress (<http://thomas.loc.gov/>) and search for H.R. 453. ♦

medical research. The petitioners argued that their efforts to protect animals and to promote non-animal alternatives have been harmed because USDA has failed to extend AWA protections and review and reporting requirements to rats, mice, and birds.

In mid-March, the petitioners filed suit in US District Court to compel USDA to include rats, mice, and birds under the AWA.

The Animal and Plant Health Inspection Service (APHIS) is the USDA agency responsible for enforcing humane care standards under both the AWA and the Horse Protection Act. AWA standards apply to research institutions, commercial animal breeders, commercial transporters such as airlines, and exhibitors such as zoos, circuses, and marine mammal facilities. APHIS also enforces the AWA provisions that regulate so-called "Class B" animal dealers, who supply non-purpose-bred dogs and cats for research. APHIS enforcement of pet theft prevention rules for Class B dealers has played an important role in recent years by making it possible to refute the accusations of animal rights groups that scientists routinely use stolen pets in research. (See companion article concerning the re-introduction of legislation to eliminate Class B dealers.)

In its January 28 *Federal Register* notice, the USDA's Animal and Plant Health Inspection Service (APHIS) noted that most rats, mice, and birds used in research are already subject to humane care guidelines. That is because major academic institutions receive funding from the NIH, which follows the Public Health Service Policy on Humane Care and Use of Laboratory Animals. The PHS Policy mandates that the care of all vertebrate animals conforms to the standards set forth in the *Guide for the Care and Use of Laboratory Animals*.

The *Guide* is also the required standard of care for facilities accredited by the Association for Assessment and

(continued on page 90)

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Accreditation of Laboratory Animal Care, International (AAALAC). AAALAC accredits many academic institutions and all the major pharmaceutical companies. Therefore, rats, mice, and birds at these institutions are also covered by the *Guide*.

Although both the *Guide* and AWA regulations provide animal welfare standards, the AWA tends to do so much more from the perspective of individual animals. When it comes to mice, this approach would lead to significant paperwork burdens since these animals are usually tracked as groups by cage rather than as individuals. AWA coverage would also mean additional paper-

work to keep track of how many mice pass through the facility and to assess and report the degree of pain and distress each animal undergoes.

The inclusion of rats, mice, and birds under the AWA would also expand greatly the workload for the Animal Care staff at APHIS at a time when it is struggling to enforce the current regulations. AWA funding has remained stagnant at about \$9 million for most of the decade, resulting in a net loss of about 3 inspectors per year. If rats, mice, and birds were to be covered, there would be more work than the Animal Care staff could handle. APHIS would have to issue new regulations concerning species with which most of the current

inspectors have little expertise. It would also have to register and inspect thousands of previously unregulated facilities. This could jeopardize its ability to fulfill its mission with respect to rats, mice, and birds, as well as already-regulated species.

Comments may be sent by May 28 to USDA. Note in the text that the comments are in reference to Docket No. 98-106-1. Send an original and three copies to:

**Docket No. 98-106-1
Regulatory Analysis
and Development PPD
APHIS, Suite 3C03
4700 River Road, Unit 118
Riverdale, MD 20737-1238**

Bills to Boost NIH Introduced

Several Members of Congress have introduced legislation showing support for increased NIH spending.

On January 19, Senators Arlen Specter (R-PA) and Tom Harkin (D-IA) introduced a "sense of the Senate" resolution calling upon Congress to provide a \$2 billion increase for biomedical research in FY 2000. A similar non-binding "sense of the House" resolution was introduced March 2 by Rep.

George Gekas (R-PA), chairman of the House Biomedical Research Caucus. This resolution was co-sponsored by Reps. Ken Bentsen (D-TX), Nancy Pelosi (D-CA) and Sonny Callahan (R-AL).

Meanwhile, Rep. Michael Bilirakis (R-FL) introduced legislation in the House that would allow taxpayers to donate part of their income tax refunds to NIH-sponsored medical research.

The bill, H.R. 785, is called the "Biomedical Research Assistance Voluntary Option Act." It was introduced on Feb. 23 and referred jointly to the Ways and Means and Commerce Committees. The House Ways and Means Committee has jurisdiction over tax issues, while the Commerce Committee has jurisdiction over the NIH. ♦

NIGMS Co-Sponsor of Request for Applications

NIGMS is a co-sponsor of a Request for Applications (RFA) that appears in this week's NIH Guide for Grants and Contracts. The RFA, entitled "Centers for Dietary Supplements Research: Botanicals," is on the Web at <http://www.nih.gov/grants/guide/rfa-files/RFA-OD-99-007.html>.

It will support specialized research centers to investigate the biological effects of botanicals, including—but not limited to—botanicals available as

dietary supplements. According to the RFA, "It is anticipated that a fully integrated Center eventually will have the capacity to 1) identify, characterize and authenticate botanicals, 2) assess the bioavailability and bioactivity of botanical ingredients, 3) identify active constituents in botanicals [and] explore their mechanism(s) of action, and 4) conduct both pre-clinical and clinical evaluations of botanicals."

NIGMS also published a notice relat-

ing to its program on "Exploratory Studies for High Risk/High Impact Research." Previously, the direct costs per year were limited to \$70,000, but this has been raised to \$75,000 to assist investigators with the \$25,000 increment requirement of the NIH modular grant application process. The notice appears on the Web at <http://www.nih.gov/grants/guide/notice-files/not99-036.html>. ♦

OMB Asks for Comments on FOIA Data Release

On February 4 the Office of Management and Budget (OMB) published the anticipated Notice of Proposed Rulemaking to give the public access to data from federally funded research through the Freedom of Information Act (FOIA). Comments on the proposal were due by April 4.

The regulatory notice came in response to a provision in last year's omnibus FY 1999 appropriations bill. The provision, sponsored by Sen. Richard Shelby (R-AL), required OMB to amend its Circular A-110 to permit the public access to research data under the FOIA law. Circular A-110 is the document setting forth the administrative arrangements applicable when the federal government provides grant or contract funds to institutions of higher learning, hospitals, and other non-profit organizations.

Sen. Shelby wrote the language to compel the release of data after having been repeatedly frustrated in his efforts to gain access to research data that had been cited by the Environmental Protection Agency as justification for tightening air pollution standards. Although access to the data was ultimately arranged, Sen. Shelby took exception to the notion that federal grantees were not required to release their data.

The legislative provision was written broadly to apply to all kinds of research, which raised many concerns in the research community. Some of those concerns were allayed initially because the language of the *Federal Register* notice was targeted to post-publication data that had been invoked in federal policy-making. The proposed revision makes the point that government has the right to "obtain, reproduce, publish or otherwise use" data that were produced with federal funding. It then states that the government may ask federally-funded researchers to supply "data relating to published research findings produced under an award that were used by the Federal Government in developing pol-

icy or rules" in order to release that information to the public in response to FOIA requests.

Nevertheless, many still saw problems with the proposal. While OMB specified that the FOIA release provision would apply only to published data used by the government to develop policy or rules, that still left a number of key terms undefined. For example, "data" could apply to any number of items, such as lab notebooks, computer disks, specimens, and preliminary analyses of data. Also, what would be considered the point of publication? If a portion of a data set was published, would the entire data set be subject to release?

The stipulation that the research must have been used to develop federal policy or rules would seem to exempt much biomedical research. The NIH is not itself a regulatory agency, but NIH-funded research could be used by another agency to set rules or policy regarding recommended treatment regimens, efficacy of drugs, health effects of chemicals, or the acceptability of scientific evidence in court. This raises the related question as to how closely linked to the rule or policy the research must be in order to fall within the scope of a FOIA request.

Concerns were also raised about using the Freedom of Information Act to compel data sharing since it was originally put into place to give the public access to records held by federal agencies. The FOIA provides certain protections and exemptions, such as for confidential or proprietary information, but many questioned whether those protections would be adequate for certain kinds of research data. For example, identifying information about particular patients in a clinical trial would be deleted. However, the clinical centers themselves would have to be named. This might still make it possible to break the blinding of the study or might otherwise compromise the privacy of those involved.

FOIA also makes no restrictions on how information may be used. The mere possibility that study data could someday be released might discourage some patients from enrolling in clinical trials. Similarly, many universities worry that industry collaborations will end if competitors can use FOIA requests to gather intelligence. FOIA requests could also be used by politically motivated individuals to disrupt controversial research involving genetic engineering, research animals, or the health effects of tobacco or environmental pollution.

FOIA contains no provisions to compensate the costs of responding to information requests. The OMB notice stated that if an agency asks a researcher to provide data for a FOIA request, it may "charge the requester a reasonable fee equaling the full incremental cost of obtaining the data." However, it was not clear how these costs would be calculated, nor how they would be paid to the researcher, who would have to take time out from research activities to respond to the request.

Many academic institutions and research organizations indicated that they would provide comments to OMB about these problems while also asking Congress to consider repealing the legislation. It was suggested that the National Academy of Sciences be asked to recommend ways to implement data sharing.

Even as these concerns were being aired, Sen. Shelby continued to insist that the law should remain in place. "This measure was long overdue, and it represents a first step in ensuring that the public has access to all studies used by the federal government to develop federal policy," Shelby told the *Wall Street Journal*.

At press time APS was still developing its comments, which will be posted on the Public Affairs page of the APS web site at www.faseb.org/aps/foia.htm.



NIH Award Numbers and Success Rates for FY 1998

NIH has released grant and award statistics for FY 1998. According to the information recently posted at <http://silk.nih.gov/public/cbz2zoz.@www.trends98.he.suc-crate.dsncc>, physiology (shown in blue) compares well with

other basic sciences departments. The information also shows that the number of NIH awards and the success rates for all departments has improved from 1993 to 1998. ♦

Table 1. Number of NIH Grants and Awards in 1993 and 1998.

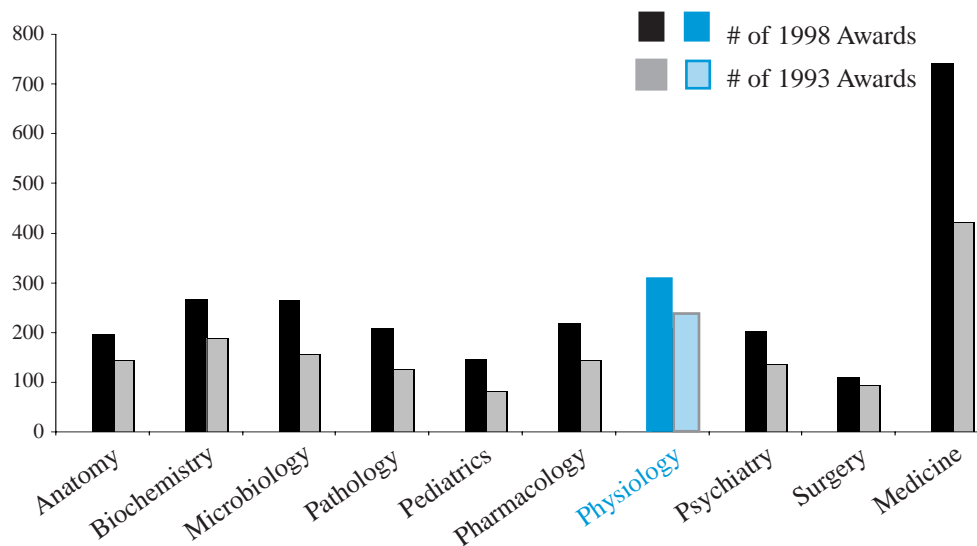
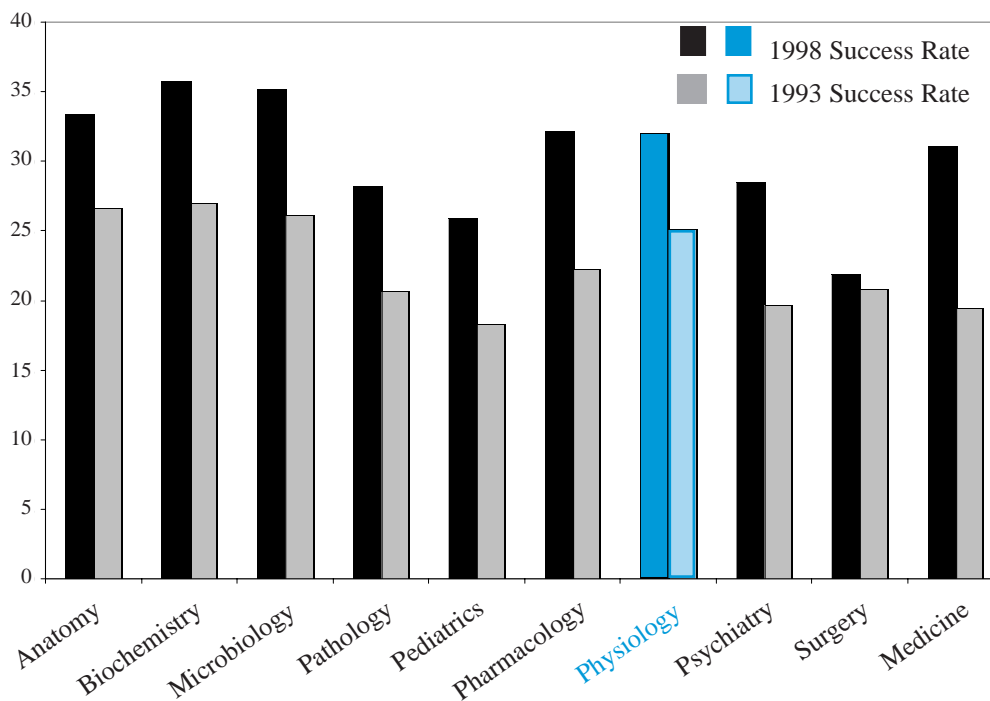


Table 2. NIH Success Rates in 1993 and 1998.





Congressional Advocacy Workshop At Experimental Biology '99

Saturday, April 17, 1999

1-3 pm

**Grand Hyatt Hotel
Conference Theater**

Join us for this special session to
sharpen your skills as a legislative
advocate for biomedical research.

Refreshments will be served.

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The Political Game – Winning and Losing

Shirley L. Ruhe, SLR Budget and Legislative Consulting

Shirley L. Ruhe has more than 24 years of experience in Congressional budgeting and the legislative process, most recently serving as Director of Budget Priorities and Economic Policy for the House Budget Committee from 1987-1994. For the past three years, Ms. Ruhe has put this experience to work as head of her own consulting firm, where she now advises organizations such as FASEB how win the battle of the budget. She developed this workshop to train scientists to be effective advocates for biomedical research.

Political Advocacy Made Easy

***The Hon. Butler Derrick, Powell, Goldstein, Frazier
and Murphy***

Michael A. Stephens, Vice President, Van Scoyoc Associates

Butler Derrick (D-SC) represented South Carolina's 3rd Congressional District for 20 years, from 1975 until his retirement in 1995. He now heads the government relations practice for the Washington, DC office of Powell, Goldstein, Frazier & Murphy, LLP. During his Congressional career, Derrick rose to become the Chief Deputy Majority Whip, the fifth-highest ranking House Leadership post. His committee assignments included the Rules committee (where he was Vice Chairman), Budget, Banking, and Government Relations.

Michael A. Stephens was a professional staff member for the House Labor-HHS-Education Appropriations Subcommittee for 20 years, and its Staff Director for 6 years. A recognized authority on the Congressional appropriations process, he is frequently quoted by National Public Radio, Science and The Washington Fax because of his expertise in biomedical research issues and the NIH. Mr. Stephens currently serves as consultant to FASEB on government affairs issues.

Feature presentation: You will also have the opportunity to applaud your colleagues as they demonstrate the right and wrong ways to meet a Member of Congress.

How to Answer Tough Questions

***J.R. Haywood, University of Texas Health Science
Center, San Antonio***

This segment will focus on how to get the message across. It will also provide guidance on ways to handle tough questions that might come up when you meet with Members of Congress and their staff.

Positions Available

Assistant/Associate Professor Positions in Physiology/Physiopathology: New York Chiropractic College, a leading accredited college of chiropractic, has immediate openings for 2 full-time, assistant/associate professor level, basic science faculty. Located in Seneca Falls, NY, New York Chiropractic College is dedicated to providing students with a quality education that will enable them to deliver excellence in alternative health care. Faculty members are responsible for the instruction of assigned curriculum and the advisement of students. Participation in college governance through departmental and institutional committee work, ongoing scholarly activity, and professional development is also required. Candidates must possess a PhD degree in physiology, pathology, or a related discipline. Experience teaching at an accredited graduate or professional level institution as well as familiarity with instruction methods for a health care-based curriculum is desired. Applications will be accepted until a suitable candidate is found. Interested candidates should submit a cover letter and current vitae to: Office of Human Resources, New York Chiropractic College, 2360 State Route 89, Seneca Falls, NY13148. [EOE] [M/F/V/D]

Assistant/Associate Professor in Pulmonary Biology/Physiology: The Department of Physiology at Michigan State University invites applications for a full-time tenure-track appointment at the Assistant/Associate Professor level. The successful candidate will be expected to develop an independent research program in the area of pulmonary biology. Preference will be given to those individuals who utilize modern molecular, cellular, or imaging techniques to investigate chronic pulmonary diseases, such as asthma and cystic fibrosis. Candidates must hold a PhD or equivalent doctoral degree, have postdoctoral experience, and demonstrate potential for developing a vigorous externally funded research program and outstanding teaching in the department's educational program. Interested individuals should provide a complete curriculum vitae, a brief statement of research interests, and copies of key publications. Applicants should also provide the names of three individuals who can evaluate their accomplishments and future potential for research and teaching. Applications should be sent to: Seth R. Hootman, PhD, Chairperson, Pulmonary Biology Search Committee, Department of Physiology, Michigan State University, East Lansing, Michigan 48824-1101. A review of applications will begin on April 15, 1999 and will continue until the position is filled. Handicappers have the right to request and receive reasonable accommodation. [EO/AAE]

Assistant Professor: The Department of Physiology at the Ponce School of Medicine invites applications for a faculty position at the level of Assistant Professor. We are seeking individuals with a PhD or equivalent and postdoctoral experience. The successful candidate will be expected to participate in the medical and graduate student programs and to develop an independent research program. Review of candidates will begin immediately and will continue until the position is filled. Send curriculum vitae, a statement of goals, and the names and addresses of three references to: Howard Mass, PhD, Chairman, Physiology Department, Ponce School of Medicine, PO Box 7004, Ponce, PR 00732. Email: hmass@caribe.net. Women and minorities are encouraged to apply. [EOE/AA]

Tenure-track Positions in Exercise Science: The Department of Exercise Science and Leisure Management at The University of Mississippi has three full time tenure-track positions at the Assistant/Associate level in the Division of Exercise Science. Primary consideration will be given to candidates who demonstrate teaching and research abilities in one of the following areas: 1) cardiovascular physiology, 2) muscle/neural physiology, and 3) wellness/health promotions/epidemiology. Secondary consideration will be given to candidates with expertise in physiology of aging, sports nutrition, biomechanics, athletic training, and/or research and statistics. Qualifications include 1) earned doctorate in exercise science or related field, 2) evidence of teaching experience within the discipline, 3) publication record commensurate with rank and experience, 4) grant record commensurate with rank and experience, and 5) commitment to working in a multi-cultural environment. Responsibilities include 1) teaching undergraduate and graduate classes in exercise science and/or wellness programs, 2) conducting and publishing scholarly research, 3) advising undergraduate and graduate students, 4) directing theses and dissertations, and 5) pursue external funding. The department offers the BS, MS, and PhD in Exercise Science and the MS in Wellness. Salary will be commensurate with qualifications and experience. Starting date is August 1999 or when the position is filled. Review of application materials will begin February 15, 1999, and will continue until all three positions are filled. Send letter of application, curriculum vitae, reprints, and names and addresses of five references to: Dr. Don Cheek, Chair, Department of Exercise Science and Leisure Management, Turner Center, University of Mississippi, University, MS 38677. Tel: 601-232-5521; fax: 601-232-5525; email: dcheek@olemiss.edu; Internet: <http://www.olemiss.edu/depts/eslm>. The University of Mississippi is an EEO/AA/ADA/ADEA/Titles VI and IX/Section 504 Employer.

Positions Available

Research Professor: Applications are invited for a new professorship in work physiology at the Department of Physiology, The National Institute of Occupational Health (AMI; Web site: <http://www.ami.dk>), Copenhagen, Denmark. In co-operation with the Head of the Department, the successful candidate will be responsible for further development of the research profile within the department's strategic program. The ideal candidate should possess an academic degree and research experience within work physiology documented by a scientific production (articles, books, etc.) at the international level. Moreover, the candidate should also have contributed actively to the further development of the discipline. The qualifications correspond to the level of a university professor. Experience with implementation of new projects, multi-disciplinary co-operation, research management, and handling of sector-specific tasks including advisory services would be advantageous. Moreover, it is expected that the successful candidate has experience with supervision of younger scientists and PhD students. Finally, the candidate should also have experience with teaching and information activities aimed at different target groups and experience with international research co-operation.

The candidate is employed in the Department of Physiology at the National Institute of Occupational Health for a period of 5 years with a possible extension for 3 years. The salary is approximately DKK 410,000 per annum + 15% pension.

Candidates should apply in writing enclosing a full curriculum vitae with 3 copies of 5 relevant articles to The National Institute of Occupational Health, Lersø Parkallé 105, 2100 Copenhagen, Denmark. Please quote ref: 1999-162-13. Closing date for applications: 18 May 1999 at noon. Informal enquiries may be addressed to Director General Ib Andersen (Tel: +45-39-16 52 04) or to Research Director Otto Melchior Poulsen (Tel: +45-39-16 52 19).

Senior Scientist Positions Available: Hackensack University Medical Center (HUMC) has distinguished itself as a leading clinical facility serving northern New Jersey. The 652-bed teaching facility offers a wide range of clinical services in all medical and dental specialties. Residents from the University of Medicine and Dentistry of New Jersey receive a substantial portion of their specialty training through rotations at HUMC. Presently, research at HUMC is primarily in the area of drug trial investigation and clinical research. There is, however, some basic and translational research being conducted. The Departments of Medicine, Oncology, Pathology, Pediatrics, Pediatric Oncology, and Surgery are noted as being particularly active in clinical and translational research. HUMC is presently in the process of constructing a 55,000-square-foot research facility, which will be available for occupancy on or about May 15, 2000. Applicants interested in submitting applications should have qualifications commensurate with appointment at the Senior Scientist level. A major commitment of the institute will be in the area of cancer research with emphasis on risk identification, pharmacogenetics, pharmacology, molecular biology approach to the study of cancer, and immunology. Other disciplines, however, will be represented. The successful candidate should possess an earned doctoral degree (MD/PhD) and a proven track record in obtaining grants from peer-review agencies. HUMC is located approximately 15 miles from mid-town Manhattan and is in proximity to other major medical centers and research institutes. Qualified applicants should send a curriculum vitae to: Louis J. Ramazzotto, PhD, Director, Institute for Biomedical Research, Hackensack University Medical Center, 30 Prospect Avenue, Hackensack, NJ 07601.

Assistant Research Scientist: The University of Iowa College of Medicine, Department of Internal Medicine, Cardiovascular Diseases Division, is seeking an Assistant Research Scientist to undertake basic neurophysiological studies of central nervous system mechanisms involved in cardiovascular regulation, with responsibility for identifying and selecting problems to be studied, developing hypotheses and appropriate methods for testing them, conducting experiments independently, analyzing results, writing abstracts and manuscripts describing the results obtained, and presenting data at local and national scientific meetings. This position requires a PhD in physiology or a closely related scientific discipline, or the professional equivalent, plus demonstration through prior work record of progression in respon-

sibility for developing and executing new research studies to a level at which successful independent investigative effort can be anticipated. At least 3 years of postdoctoral training in neurophysiology and demonstrated expertise in electrophysiological recording and microinjection techniques in the central nervous system in in vivo animal preparations is desired. A broad conceptual background in central neural mechanisms of cardiovascular regulation and cardiovascular reflex control is desired. Please send resume and cover letter indicating position #39271 to: Carol Wehby, Human Resources, Internal Medicine, The University of Iowa, E400 GH, 200 Hawkins Drive, Iowa City, IA 52242-1081. Women and minorities are strongly encouraged to apply. [EO/AEE]

Positions Available

NIH Postdoctoral Position: An NIH-supported position is available at the Medical College of Virginia to study the neural, paracrine, and molecular mechanisms regulating peptide and acid secretion in the stomach. Studies are to be performed in intact tissues, glands, and isolated cells. Minimum requirements include a PhD and/or MD degree and a strong background in molecular biology. Experience in immunohistochemistry and cell isolation is highly desirable. Candidate must be a permanent resident or US citizen and a potential candidate for an academic career. Salary will be \$25,000-35,000+, depending on qualifications and previous experience. Interested persons should send a curriculum vitae along with the names and addresses of 3 references and copies of recent publications to Dr. Mitchell Schubert, Department of Gastroenterology (111N), McGuire VAMC, 1201 Broad Rock Blvd., Richmond, VA 23249. Fax: 804-675-5816; email: schubert.mitchell@richmond.va.gov.JOB#*

Postdoctoral Position: A postdoctoral position is available in the program, "Lung Biology and Respiratory Physiology (HL-07027)," which is based in a strong Physiology Department at the University of Pennsylvania Medical Center and features an interdisciplinary training faculty with independent research programs related to fundamental aspects of lung biology. The trainees will get involved in such a program. The salary will depend on experience according to NIH pay scales. We will have two positions available by July 1, 1999. The prospective applicants are requested to apply to: Dr. S. Lahiri, Department of Physiology, B-400 Richards Building, University of Pennsylvania Medical Center, Philadelphia, PA 19104-6085. Only US citizens and candidates with permanent residence need apply.

Postdoctoral Research Position: A postdoctoral position is available immediately using in vivo neurophysiological techniques to investigate neural control of the cardiovascular system. Emphasis is placed on previous experience measuring nerve activity and hemodynamic variables in small conscious animal models and an interest in learning CNS extracellular/intracellular recording of single unit activity. Applicants should have a DVM, MD, or PhD in physiology, pharmacology, or related fields. Send curriculum vitae, list of publications, and names of three people who can serve as references to: Ann Bonham, PhD, One Shields Avenue, Division of Cardiovascular Medicine, TB 172, University of California, Davis, CA 95616. Tel.: 530-752-8697; fax: 530-752-3264; email: acbonham@ucdavis.edu. Initial appointment is for two years with salary commensurate with experience.

Postdoctoral Positions in Cardiovascular Molecular Biology: Six positions are available now for one of the longest active NHLBI Training Grants in Cardiovascular Molecular Biology. The NIH grant REQUIRES US Citizenship or permanent residency. Studies include transgenics, knockouts, mouse physiology, heart failure mechanisms, gene-treatment strategies. Particular need for a patch-clamp electrophysiologist. Some of the projects include molecular biology of ion channels, molecular studies of autonomic signal transduction, NaK-ATPase, sarcoplasmic reticulum, tropomyosin, actin, gene therapy, and heart failure. Most projects involve transgenic mice. Preparation for careers in academics and industry emphasized. PhD and/or MD required. Most of the laboratories are located in a new state-of-the-art Cardiovascular Center. Contact Dr. Arnold Schwartz, Prof/Director Inst. Molec. Pharm./Biophys. U. Cincinnati, CV Center, Cincinnati, OH 45267. Tel: 513- 558-2400; fax: 513- 558-1778; email: schwara@email.uc.edu. Candidates are also invited to check the WEB site: http://www.med.uc.edu/cardio_bio. [AA/EOE]

Postdoctoral Position in the Experimental & Computational Neurobiology Laboratory, Biomedical Engineering Program, IUPUI: An opportunity is available for integrative study of ion channel properties in cardiac sensory afferent neurons. Experimental procedures include patch clamp neurophysiology of fluorescently visualized cardiac afferent cells from dissociated sensory ganglia and brainstem tissue slice. Computational methodologies include the development and application of biologically realistic membrane models for investigating the nonlinear dynamics of neural discharge and synaptic efficacy. The operational philosophy of this laboratory is to utilize neuronal modeling to provide a conceptual framework with which to functionally interpret in vitro data as well as a way of better directing and organizing future studies to test model based hypotheses. The ideal candidate would have a background in either the experimental or computational neurosciences and would be highly motivated to train and conduct research in both areas. Experience using standard electrophysiologic instrumentation and computers for data acquisition and analysis is desired. Experience in microneurosurgery and general pharmacology are acknowledged assets. Salary is dependent upon relevant postdoctoral experience and will follow NIH guidelines. Three years of support are available through an existing award from the American Heart Association. Please send a CV and a list of professional references to: John H. Schild, PhD, Electrical & Biomedical Engineering, IUPUI - Room SL160, 723 W. Michigan St., Indianapolis, IN 46202. Tel: 317-274-9747; email: jhs@enr.iupui.edu.

Positions Available

Postdoctoral Research Position: A postdoctoral fellowship is available immediately under the direction of Ann Bonham, Division of Cardiovascular Medicine at the University of California, Davis, to study central nervous system control of the cardiovascular system. Emphasis is placed on in vivo and in vitro neurophysiological and molecular biological techniques to investigate synaptic mechanisms underlying cardiovascular-related signal transmission in the CNS. Applicants should have a PhD in physiology, cell or molecular biology, pharmacology, or related fields. Previous experience in patch clamping and molecular biology or neuroanatomy preferred. Send curriculum vitae, list of publications, and the names of three people who can serve as references to: Ann Bonham, PhD, Division of Cardiovascular Medicine, One Shields Avenue, TB 172, University of California, Davis, CA 95616. Tel.: 530-752-8697; fax: 530-752-3264; email: acbonham@ucdavis.edu. Initial appointment is for two years with salary commensurate with experience.

Electrophysiology Laboratory Technician: The Laboratories of Cellular and Molecular Physiology in the Anesthesiology Research Division at Vanderbilt University Medical Center has a full-time technician position available. Current research interests focus on cellular, molecular, and biophysical characterization of volume-sensitive anion channels and putative mechanosensitive channels belonging to the DEG/ENaC superfamily. Candidates should have extensive experience with patch clamp and other electrophysiological methods, and should have a working knowledge of molecular biological techniques. Salary and rank are negotiable and commensurate with experience. Qualified, enthusiastic, and highly motivated individuals should send a curriculum vitae; summary of research experience; and the names, addresses, and telephone numbers of three references to: Dr. Kevin Strange, Director, Anesthesiology Research Division, Department of Anesthesiology, Vanderbilt University, 504 Oxford House, 1313 21st Avenue South, Nashville, TN 37232. Email: kevin.strange@mcmail.vanderbilt.edu.

Postdoctoral Fellow in Electrophysiology: The Center for Perinatal Biology, Departments of Physiology and Pharmacology, Loma Linda University, Loma Linda, CA, has a postdoctoral position available for an electrophysiologist. Current research involves regulation of vascular tone in cerebral arteries (fetal, newborn, and adult sheep), the role of the several elements of the signal transduction cascade in the ontogeny of vascular responses, and their change in response to high altitude, long-term hypoxia. The project will involve a multifaceted study of ion channel function in the regulation of cerebral vascular muscle microcirculation. The position will involve patch-clamp studies of single arteriolar muscle cells, and conventional microelectrode studies in vivo and in vitro. The ideal candidate would have a PhD in physiology, pharmacology, vascular cell biology, or biophysics with excellent writing skills and the ability to work and think independently. Experience with patch clamp, in vitro study of arterioles or small arteries, intravital microscopy, and/or conventional electrophysiology would be highly desirable. The candidate should be interested in interpreting ion channel biophysics, vascular cell biology, and in vivo microcirculatory physiology. Qualified and enthusiastic individuals should send a curriculum vitae; summary of research training; statement of future goals; and the names, addresses, and telephone numbers of three references to: Lawrence D. Longo, MD, Center for Perinatal Biology, Loma Linda University, School of Medicine, Loma Linda, CA 92350.

Instructor/Postdoctoral Fellow Positions in Electrophysiology: The Laboratories of Cellular and Molecular Physiology in the Anesthesiology Research Division at Vanderbilt University Medical Center has instructor and postdoctoral positions available for patch-clamp electrophysiologists. Current research interests focus on cellular, molecular, and biophysical characterization of volume-sensitive anion channels and putative mechanosensitive channels belonging to the DEG/ENaC superfamily. The position will involve electrophysiological and molecular biological studies of native and heterologously expressed channels. The collaborative research environment at Vanderbilt University for individuals interested in ion channel and transporter biology is outstanding. Candidates should have a PhD in physiology or a related discipline, should be able to work and think independently, and should be highly motivated to develop a career as an independent basic scientist. Salary and rank are negotiable and commensurate with experience. Qualified, enthusiastic, and highly motivated individuals should send a curriculum vitae; summary of research training; statement of future career goals; and the names, addresses, and telephone numbers of three references to: Dr. Kevin Strange, Director, Anesthesiology Research Division, Department of Anesthesiology, Vanderbilt University, 504 Oxford House, 1313 21st Avenue South, Nashville, TN 37232. Email: kevin.strange@mcmail.vanderbilt.edu.

Murad Named Director of Institute of Molecular Medicine for the Prevention of Human Diseases

Ferid Murad, who received the Nobel Prize for Physiology or Medicine in January for his work with nitric oxide, has been selected to serve as director of the University of Texas-Houston Institute of Molecular Medicine for the Prevention of Human Diseases (IMM).

Murad succeeds the late IMM director, Hans J. Muller-Eberhard, who died March 3, 1998. Until his most recent appointment, Murad was chairman of the Department of Integrative Biology, Pharmacology and Physiology at the University of Texas-Houston Medical School.



Ferid Murad

M. David Low, president of the University, said, "We searched the world for the eminent scientist who would become the IMM's second director, and we found him in our own backyard! Ferid Murad is a stellar scientist who has already contributed much to the world's body of scientific knowledge. It is therefore appropriate that UT-

Houston's first Nobel Laureate become the director of IMM."

The IMM was established in 1995 to conduct fundamental scientific research at the cellular and molecular level in order to prevent human diseases. ♦

Betz Chosen as University of Utah Medical School Dean

A. Lorris Betz has been selected as Dean of the University of Utah Medical School and the University's Senior Vice President for Health Sciences.

Betz, former dean of the University of Michigan Medical School, will begin his new position July 1.

"Dr. Betz will provide exceptionally strong leadership to ensure that the University of Utah's health sciences remain at the forefront nationally," said the University's President Bernie Machen.

In addition to serving as the medical school Dean, Betz will also run the Huntsman Cancer Institute and the University's Colleges of Health, Nursing and Pharmacy, and retain a faculty position at the University's Medical School. ♦

APS Sustaining Associate Members

The Society gratefully acknowledges the contributions received from Sustaining Members in support of the Society's goals and objectives.



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Pharmacia and Upjohn, Inc.

Procter & Gamble Company

Quaker Oats Company

Rhone-Poulenc Rorer

Sandoz Pharmaceuticals Corporation

W. B. Saunders Company

Schering-Plough Research Institute

G. D. Searle and Company

SmithKline Beecham Pharmaceuticals

Wyeth-Ayerst Laboratories

People & Places

Lukaski ARS Senior Research Scientist of the Year

Research physiologist **Henry C. Lukaski**, with the Agricultural Research Service (ARS), was recognized by the agency as senior research scientist of the year for ARS' Northern Plains area for his long-term contributions in nutrition and physiology.

Lukaski conducts research at the ARS's Grand Forks Human Nutrition Research Center in North Dakota.

"Dr. Lukaski is internationally recog-

nized for developing new and improved methods for measuring body composition—an important indicator of health. He also has discovered important relationships between nutrition and physiological function," said ARS administrator Floyd Horn. "In addition, he is committed to helping young scientists and aspiring student scientists to get a good start."

His work has also alerted the fitness and sports medicine community that body levels of several trace elements such as copper, zinc, iron, magnesium, and chromium affect physical performance and, in turn, are affected by strenuous activity. He has shown the importance of iron, zinc, copper and selenium in regulating body temperature and energy levels. ♦

Deadlines! Deadlines!

The APS sponsored awards are plentiful, but in order to be considered, don't forget to submit the application information before the deadline!

Award

Teaching Career Enhancement Awards
John F. Perkins, Jr., Memorial Fellowships
William T. Porter Fellowship Award
Research Career Enhancement Awards
Teaching Career Enhancement Awards
John F. Perkins, Jr., Memorial Fellowships
Procter & Gamble Professional Opportunity Awards
Caroline tum Suden/Francis A. Hellebrandt
Professional Opportunity Awards
Liaison With Industry Award
NIDDK Travel Fellowships for Minority Physiologists
Shih-Chun Wang Young Investigator Award
Arthur C. Guyton Awards for Excellence in Integrative Physiology
Orr E. Reynolds History Award
Giles F. Filley Memorial Awards for Excellence in
Respiratory Physiology and Medicine
William T. Porter Fellowship Awards
APS Postdoctoral Fellowship in Physiological Genomics
AAAS Mass Media Science and Engineering Fellowship
Research Career Enhancement Awards

Next Deadline

April 15
May 15
June 15
August 15
October 15
November 15
November 15
November 16
November 16
November 23
December 1
December 1
December 1
December 1
January 15
January 15
January 15
February 15

People & Places

David Bates recently moved from the Cardiovascular Research Institute, University of Leicester, Leicester, England. Bates is now a Lecturer with the Department of Physiology, The New Veterinary School, Bristol, England.

Formerly a Graduate Student with The Miami Project, Miami, FL, **Kori L. Brewer** is presently a Research Instructor with the East Carolina University School of Medicine, Greenville, NC.

Karen P. Briski has joined the Division of Basic Pharmaceutical Science, Northeast Louisiana University College of Pharmacy, Monroe, LA. Prior to her new position, Briski was with the Department of Veterinary and Comparative Anatomy, Pharmacology and Physiology, Washington State University, Pullman.

Accepting a position with Ouachita Baptist University, Arkadelphia, AR, **David S. Brooks** has moved from the Department of Biology, Le Tourneau University, Longview, TX.

Stanley Paul Brown was affiliated with the Department of Exercise Science, University of Mississippi, University, MS. Currently, Brown is with the Department of Physical Therapy, Southwest Baptist University, Bolivar, MO.

Vernon Terence Cannon has affiliated with the Robert Wood Johnson Medical School, Randolph, NJ. Prior to his new position, Cannon was with the Department of Biology, Georgia State University, Atlanta, GA.

Samuel H. H. Chan has moved from the Institute of Pharmacology, National Yang-Ming University, Taipei, Taiwan. Chan is now the Director of the National Sun Yat-sen University, Center for Neuroscience, Kaohsiung, Taiwan.

Formerly a Research Fellow with Schering Plough Research Institute, Kenilworth, NJ, **Peter J. S. Chiu** has joined the Central Research Division of Pfizer Inc., Groton, CT.

Vincent J. Cristofalo is currently the President of the Lankenau Medical Research Center, Wynnewood, PA. Previously, Cristofalo was the Audrey Meyer Mars Professor and Director, Gerontological Research Center, Medical College of Pennsylvania, Philadelphia, PA.

Russell T. Dowell has left the Lake Erie College of Osteopathic Medicine, Erie, PA, to join the National Institutes of Health Center for Scientific Review, as Health Sciences Administrator, Bethesda, MD.

Now affiliated with the University of Florida, Gainesville, FL, **Michael A. Ferguson** was with the Georgia Prevention Institute, Medical College of Georgia, Augusta, GA.

Shengyun Fang is currently a Postdoctoral Fellow with the National Cancer Institute, Bethesda, MD. Prior to his new affiliation, Fang was with the Department of Anatomy and Cell Biology, University of Iowa, Iowa City, IA.

Nick E. Flynn has joined the Department of Medicine/Human Nutrition, Columbia University, Teaneck, NJ. Prior to his new affiliation, Flynn was with the Faculty of Nutrition, Texas A&M University, College Station, TX.

Having moved from the Department of Cardiovascular Medicine, University of California, Davis, CA, **Janeen M. Hill** has joined the Department of Kinesiology, Natural & Applied Science, Chapman University, Orange, CA.

As Professor and Chairman, **Alan David Kaye** recently joined the Department of Anesthesiology, Texas Tech University Health Science Center, Lubbock, TX. Prior to his new position, Kaye was associated with the Department of Anesthesiology, Tulane University Medical Center, New Orleans, LA.

David Megirian, formerly a Visiting Professor, Department of Physical Therapy and Exercise Science, SUNY at Buffalo, NY, has recently joined the Division of Neuroscience, John Curtin School of Medical Research, Australian National University, Canberra, Australia.

Moving from the Department of Surgery, University of Texas-Houston Medical School, Houston, TX, **David W. Mercer** recently joined the Department of Surgery, Lyndon B. Johnson General Hospital, Houston, TX.

Gibson K. Oriji has affiliated with the Department of Biology, College of Science & Health, William Patterson University, Wayne, NJ. Oriji was previously with the Hypertension and Endocrinology Department, National Heart, Lung, and Blood Institute, Bethesda, MD.

Joining the Department of Biology, University of California-Santa Cruz, CA, as a Graduate Student, **Rudy M. Ortiz** has left the Ames Research Center/NASA, Moffett Field, CA.

Now affiliated with Children's Hospital of Iowa, **Benet J. Pardini** has joined the Department of Pediatrics, Division of Pediatric Cardiology. Prior to his new affiliation, Pardini was associated with the Department of Internal Medicine, Cardiovascular Center, VA Medical Center, Iowa City, IA.

People & Places

Yuan Bo Peng has joined the National Institutes of Health Dental Cranial Facial Research, Bethesda, MD. Peng was previously affiliated with the Department of Neurosurgery, Johns Hopkins University, Baltimore, MD.

Robyn Lee Phelps has moved from the Department of Preclinical Drug Development, Battelle Columbus Lab, Columbus, OH, to join Battelle Pacific Northwest, West Richmond, WA.

Ulrich Pohl has joined the Physiology Institute, University of Munchen, Munchen, Germany. Prior to his new appointment, Pohl was with the Institute of Physiology, University of Mainz, Mainz, Germany.

Having accepted a position with the Department of Pathophysiology, University of Essen, Essen, Germany, **Jochen Rose** has moved from the Department of Molecular/Cell Cardiology, Johns Hopkins University, Baltimore, MD.

Deborah A. Scheuer has accepted a position with the Division of Pharmacology, University of Missouri, Kansas City, MO. Formerly, Scheuer was with the Department of Pharmacology, University of Texas Health Science Center, San Antonio, TX.

Moving from the Division of Cardiology, University of Texas Medical Branch, Galveston, TX, **John F. Schmedtje** has joined the Division of Cardiology, Wake Forest University School of Medicine, Winston-Salem, NC.

Elmir Sehic has joined the Department of Medicine, VA Medical Center, Wilkes Barre, PA. Sehic was previously associated with the Department of Physiology & Biophysics, University of Tennessee, Memphis, TN.

Accepting the position of Professor and Chair of the School of Medicine and Biomedical Science, SUNY Buffalo, Buffalo, NY, **Harold C. Strauss** has left the Department of Medicine and Pharmacology, Duke University Medical Center, Durham, NC.

John S. Striffler has moved from the Metabolism and Nutrition Interactions Lab, US Department of Agriculture, ARS Beltsville Human Nutrition Research Center, Beltsville, MD. Striffler has joined the Department of Diabetes, Endocrinology & Metabolism, City of Hope National Medical Center, Duarte, CA.

Elisardo Corral Vasquez has moved to the Central Biomedical University, Department of Physiology, Vitoria, Brazil. Formerly, Vasquez was affiliated with the Department of Psychology, The University of Iowa, Iowa City, IA.

What a Hit!



The APS Web Site has reached a new milestone. In the month of February, the APS home page was “hit” over **200,000** times!

COMING SOON:

The APS home page gets a new look!

Check it out at www.faseb.org/aps!

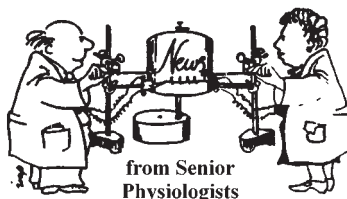
News From Senior Physiologists

Letter to Kenneth Zierler

Mario Vassalle writes: “I continue to work as a Professor of Physiology and I participate in the teaching of new curriculum which includes the case based learning (CBL) approach. I wish to express here my views on this educational approach, since the teaching of Physiology ought to be a concern of all physiologists.

“For several reasons, I am afraid that I am not wholly convinced that this CBL approach is a great step forward. A positive aspect is that it requires the active participation of the medical students, who have to prepare different learning issues for the assigned clinical cases. I have always endeavored in teaching cardiac physiology to cite clinical examples that would illustrate to the students the relationship between what they are learning in physiology and clinical matters. But I feel that the drawbacks of the CBL method are rather numerous and I will mention some.

“The method is ineffective and time-consuming, since students are requested to teach to their fellow students of the group what they have first to learn on their own. Both their teaching and self-learning suffer from lack of the necessary experience. Furthermore, they study isolated issues out of the general context and without the necessary background knowledge, since the issues may involve systems to which the students have not yet been exposed. Often, symptoms, signs and lab tests are discussed for their own sake, regardless of the fact that one aim of the first year teaching should be to provide the students with a sound understanding of the physiology of the body. The time available for teaching *and* studying physiology is considerably shrunk by the necessity of studying issues concerning clinical matters. Also, the load on the students is considerably increased by the need of learning physiology and clinical matters at the same time in the



first year. And often they have to learn technical details about lab tests which may be expected to contribute little to the understanding of the body function and would be more appropriately taught in clinical years.

“The necessity of having a large number of instructors for the small groups results in a rather uneven degree of competence on the part of the faculty members, as they have to deal with matters foreign to their field. To ask a sharp question only takes a keen mind, but to give a good answer takes more than that: what is needed is the familiarity and expertise that result from a long intimate exposure to matters discussed. But perhaps a major intrinsic contradiction is the attempt to integrate what is still to be learned. After all, diseases are not confined to material covered by a chapter or a system, as they usually require knowledge of integrated body responses.

“A byproduct of such an approach is the encouragement to consider physiological notions as accessory to clinical cases, when, instead, first and foremost the students should master physiological functions and concepts. The physiological issues not related to a particular case may not be pursued in sufficient depth and all the cases that are not studied of necessity do not exist for the students. Another major concern is that it is not clear what educational advantage is being pursued by such an approach, since neither enough physiology nor clinical medicine are learned.

“I am fully aware of the necessity of changing the educational process in response to the ever changing conditions (developments of science, teaching implements, technological advancements, new fields of research, new ways

to treat patients, etc.). My remarks are intended to stress the necessity of a critical appraisal of what we do as educators and physiologists, since a change is not always synonymous with improvement. And I assume that the last thing we would want to do is to make things worse, or to address non-existing problems, wrong problems, or right problems with wrong solutions.

“For the rest, I am engaged in electrophysiological experiments with single cardiac cells, in the pursuit of that knowledge that characterizes academic institutions. A graduate student and a postdoctoral fellow are working with me in these projects.

“Yet, as much as investigating and discovering the works of God thrill me, still I found that I need other forms of activity to satisfy the urge of expressing other facets of myself. In this regard, I published a book of poems (*Emozioni perdute/Lost Emotions*) and another of aphorisms (*l'Enigma della Mente: Aforismi/The Riddle of the Mind: Aphorisms*): I wrote them in Italian and translated them in English. In the aphorisms as well as in another book that I wrote in Italian (*Diario di un Fisiologo del Cuore, Diary of a Physiologist of the Heart*), I present my ideas about a variety of philosophical topics (just to give one example, how would one define the present, the past or the future?). As a matter of fact, I am so fascinated with the physiology of the mind that I am completing another book that I intend to entitle: *La realta dell'Io: aforismi/The Reality of the Self: Aphorisms*.

Letter to Eugene Renkin:

Fuad Lechin writes that though he is 70 years old, he is working harder than ever as a physician and research scientist at the Institute of Experimental Medicine, Central University of Venezuela, Caracas. He is worried about the future of physiology and medical science because he believes the direction in which they are developing

News From Senior Physiologists

is wrong. Doctors and researchers are isolated in their specialties, and no longer understand what is important in other areas. Physicians follow prescribed practices within their own specialty, and ignore basic medical science principles. Lechin believes that medical science needs a revolution to return to basic principles of science and philosophy.

Lechin writes: “Most doctors instructing medical undergraduate and postdoctoral students are experts in specific areas (clinicians or basic sciences). They possess fragmentary knowledge of medical sciences or technology. They have no integrative information to be transmitted to their students, thus they transmit and perpetuate the problem. I understand that there are not enough teachers possessing interdisciplinary information (basic and clinical) but there should exist some interested and qualified professors. Such professors endowed with interdisciplinary information should be responsible for this task. It is a difficult target, however, it should be attempted. Failure to do so rebounds in the failure of medical assistance, placing mankind’s health at risk.”

Letter to Michael Barany

Louis R.M. Del Guercio writes: “‘News from Senior Physiologists’” has long been one of my favorite readings in *The Physiologist*—and suddenly here I am among the survivors and immortals!

“Election to the American Physiological Society made me very proud. To paraphrase the great Dr. Johnson: ‘a surgeon doing physiology is like a dog walking on his hind legs; it’s not how well he does it, but the fact that he does it at all is what impresses one!’

“I began my academic career at the then recently opened Albert Einstein College of Medicine in 1960. Even so, all of the ‘good diseases’ were taken by others and I was stuck with cirrhosis and portal hypertension. This turned out

to be lucky because these patients are so sick that we were forced to develop bedside techniques for invasive monitoring of cardiac output with early use of computer graphics for hemodynamic and oxygen transport variables. In a series of patients undergoing portacaval shunts, we correlated the hyperdynamic systemic, pulmonary and splanchnic circulations with morbidity and mortality. Using these same physiologic profiles, in 1965 we identified the hyperdynamic state in septic shock. As a spin-off of this approach we measured cardiac output during closed and open chest massage in a series of cardiac arrest patients and found twice the blood flow by the open method.

“During those heady days of unlimited NIH support, our motto was a poem by Emily Dickinson from 1959.

*Surgeons must be very careful
when they take the knife!*

*Under their fine incisions stirs the
culprit—life!*

“This is a warning to the ‘get away with it 90% of the time’ school of surgery that physiology is needed to reduce that fatal 10% through careful preoperative fine-tuning and intraoperative monitoring.

“For a young investigator to experience ‘the joy of discovery’ as described by Alfred North Whitehead in his 1959 essay on the ‘Aims of Education’, I offer a number of aphorisms which have served me well over the years:

1) *‘More is missed by not looking than by not knowing.’* Thomas McCrae, 1920.

2) *‘Everything should be made as simple as possible, but not one bit simpler.’*; Einstein’s follow-up on the Occam’s Razor metaphor.

3) *‘In any investigation...it is most damnably dangerous to have a theory’*; Lord Peter Wimsey, Dorothy L. Sayers’ famous detective.

4) *‘If your experiment needs statistics, you ought to have done a better experiment.’*; Lord Rutherford.

5) *‘Any important experimental find-*

ing is generally unexpected rather than the result of a preconception.’; Del Guercio, corollary of Lord Wimsey’s aphorism.

“When I became Chairman of the Department of Surgery at New York Medical College in 1976 we opened a brand new tertiary care university hospital in Westchester County. My next door neighbor, the Chairman of Union Carbide, gave me good advice. ‘Spend 90% of your time recruiting and retaining top quality people.’ I have tried to do this and we now have successful centers for burns, trauma, cardiac surgery, pediatric surgery, critical care and transplantation. I have found, however, that running a Department of Surgery in a medical school is like being general manager of the Metropolitan Opera Company—except that you must be able to sing a few notes yourself to have the respect of your staff.

“As a sideline in 1983, I entered the business world, becoming one of the founders of a public medical research and development corporation, which contracted research at various universities. We had four Nobel Laureates and other notables on our Scientific Advisory Board. Work at Columbia University led to a process for impregnating latex and plastics with antimicrobial and antiviral compounds. We wasted ten years and millions of dollars trying to convince the FDA to approve our ‘Safe-Hands’ surgical gloves but they did not want us to ‘exploit’ the AIDS transmission scare. The Canadian FDA had approved them in two months. They did, however, approve the process for intravenous catheters and when we licensed it to Arrow International their ‘Arrowguard Blue’ catheter enjoyed explosive growth. We had the satisfaction of knowing that many lives were saved, since several studies showed a marked reduction in line sepsis.

“In the 23 years that I have been chairman, my wife and I have successfully raised eight children (Definition: none of them in jail). Living on the

News From Senior Physiologists

water, I have been able to go surf fishing with my dogs almost every night in season and my daughter, son-in-law and I race a one-design keelboat out of Larchmont every summer weekend.

"During the Persian Gulf conflict my wife convinced me to volunteer. I was commissioned a bird colonel and assigned as Chief of Surgery of an

Evacuation Hospital in Turkey. This was a great experience, especially since forty years previously I was a lowly 2nd Lieutenant in the Artillery. There was no shooting, but a midnight tornado wiped out the base camp and we admitted 300 casualties in half-an-hour.

"When I turned 70, I told the Dean I would be perfectly happy to retire as

Chairman. He asked me to stay on—for the sake of my wife, who said that having twice the husband and half the income was not her cup of tea! Medicine is one of the ancient 'Seven Pillars of Wisdom'. I think that physiology should be in there, too. I thank God for my health and the life I am enjoying." ♦

Books Received

Air Pollutants and the Respiratory Tract.

David L. Swift and W. Michael Foster (Editors).

Lung Biology in Health and Disease, Vol. 128.

New York: Dekker, 1999, 374 pp., illus., index, \$175.00.

ISBN: 0-8247-9521-0.

Calcium as a Cellular Regulator

Ernesto Carofoli and Claude Kee (Editors).

New York: Oxford University Press, 1999, 576 pp., illus., index, \$150.00.

ISBN: 0-19-509421-2.

Calcium Signaling Protocols.

David G. Lambert (Editor).

Methods in Molecular Biology, Vol. 114. Totowa, NJ: Humana, 1999, 359 pp., illus., index, \$79.50.

ISBN: 0-89603-597-2.

C₄ Plant Biology.

Rowan F. Sage and Russell K. Monson (Editors).

San Diego, CA: Academic, 1999, 598 pp., illus., index, \$84.95.

ISBN: 0-12-614440-0.

Hormone Resistance Syndromes.

J. Larry Jameson (Editor).

Contemporary Endocrinology.

Totowa, NJ: Humana, 1999, 301 pp., illus., index, \$125.00.

ISBN: 0-89603-652-9.

Oxygen Transport To Tissue XX.

Antal G. Hudetz and Duane F. Bruley (Editors).

Advances in Experimental Medicine and Biology, Vol. 454.

New York: Plenum, 1998, 706 pp., illus., index, \$195.00

ISBN: 0-306-46043-2.

The Mind Within the Net: Models of Learning, Thinking, and Acting.

Manfred Spitzer.

Cambridge, MA: MIT Press, 1999, 360 pp., illus., index, \$27.50.

ISBN: 0-262-19406-6.

Physiology Secrets.

Hershel Raff.

Philadelphia, PA: Hanley & Belfus, 1999, 346 pp., illus., index, \$35.00.

ISBN: 1-56053-255-6.

Review of Medical Physiology, Nineteenth Edition.

William F. Ganong, M.D.

Stamford, CT: Appleton & Lange, 1999, 851 pp., illus., index, \$38.95

ISBN: 0-8385-8252-4.

Taking Women Seriously. Lessons and Legacies for Educating the Majority.

M. Elizabeth Tidball, Daryl G. Smith, Charles S. Tidball and Lisa E. Wolf-Wendel.

ACE Series on Higher Education.

Phoenix, AZ : Oryx, 1999, 222 pp., illus., index, \$29.50.

ISBN: 1-57356-092-8.

Book Reviews

A Review of a Review

Concepts of Human Physiology

Richard L. Malvin, Michael D. Johnson, and Gary M. Malvin
Menlo Park, CA: Addison Wesley Longman, 1997, 450 pp., illus., index, \$49.00
ISBN: 0-673-98562-8

Mary Anne Rokitka's review of our book entitled *Concepts of Human Physiology* appeared in *The Physiologist*, Vol. 41, No. 6, 1998. As I read the review I was hard pressed to understand whose book she reviewed. Our text was written for undergraduates who are interested in how their body works. Such students, who generally have little or no science background, are often lost in the chemistry, physics, and biology needed for the larger texts. Yet Rokitka takes it to task for providing "a less rigorous coverage of human physiology than provided by most other undergraduate physiology textbooks." But our book is not meant for advanced students or biology majors. That is stated in the Introduction.

Rokitka believes we have not made physiological concepts clear and that figures in the circulation chapter "...are misleading to the extent that they imply an open (!) circulatory system." Rokitka

seems to have missed the important concepts in our book. In the circulation chapter, which she singles out, we present a discussion so that elementary students can perceive the relationships of evolutionary change not usually covered well in the larger texts. In our discussion of the evolution of a circulatory system we point out that unicellular animals had no need for one. As multicellular animals developed, a primitive circulatory system evolved. As an example we show an "open" system of the sponge. We then go on to describe the circulatory system of humans. It seems unlikely to us that even a naive student would ever confuse a human with a sponge.

A review usually includes some idea of the contents of the text reviewed. Yet nowhere does Rokitka tell the reader that the text includes a section on the scientific method, one on homeostasis, clearly a "concept," chapters that discuss the nature of hormone actions, general principles of the sensory systems, facilitated diffusion, the role of gate channels, etc., etc.

A beginning chapter presents the physics and chemistry required for an understanding of the physiology covered in the following chapters. This section is clearly devoted to the beginning student with little or no science back-

ground.

The material presented in the boxed sections are devoted to subjects of historical significance, many showing the student how we know what we know about the subject under discussion. We believe that these boxes are not only interesting but teach the beginning student something of how science progresses.

Rokitka's final paragraph begins, "All told, this book will serve the 'beginning student.' It is by no means the book of choice for pre-professional students...". Of course it is not, and is clearly stated in the introductory chapter. We can only wonder why Rokitka chose to review our book as if it was designed for the pre-professional student.

We wrote a book to fill what we believed to be a need. Students with no or little science background are often lost when they use many of the texts, good ones we might add, designed for science majors, and pre-professional students. Our text is, of necessity, shorter than the more popular texts. It does, however, include the important concepts of the systems. Despite the fact that Rokitka is unable to see them, they are plainly there. ♦

Richard L. Malvin
University of Michigan

Have you moved? Changed your phone or Email?

If you have moved or changed your phone, fax, or email address, please notify the APS Membership Office at
301-530-7171 or fax to 301-571-8313.

Book Reviews

Acoustical Signal Processing

Josef Syka (Editor). New York: Plenum, 1997, 616 pp., illustr., index, \$149.50
ISBN: 0-306-45608-7

This book is the proceedings of a symposium, "Acoustical Signal Processing in the Central Nervous System," held in Prague, The Czech Republic, September 4-7, 1996, the third of a series of symposia organized in Prague by Dr. Syka on similar topics. The present volume contains 56 of the contributions to that symposium. Fourteen of the 56 chapters may be regarded as reviews while 42 chapters report results of single studies.

The first section of the book titled "General Aspects" begins with an excellent overview by Bruce Masterton on the organization of central auditory pathway, emphasizing its great complexity and drawing attention to a major tract from the medial geniculate body to the amygdala involved in auditory—evoked fear reactions. This tract, often missing in texts on the auditory pathways, fades in size along the mammalian lineage and may be missing in primates and perhaps humans. The second chapter by Kent Morest reviews the role of synaptic nests, a topic that has attracted little attention but which may have general importance for the function of many parts of the central nervous system. Synaptic nests are clusters of synapses that appear as shells around small cells and that do not have the usual glial insulation between different endings. These aggregates of synapses found in the cochlear nucleus and the medial geniculate body allow slow changes (modification) in the input-output bias of whole groups of nerve cells thus analog neural communication instead of the digital, all or none function of ordinary synapses.

The following two chapters concern sound—evoked c-fos immunoreactivity and its role in plasticity of the auditory

system. Langener reviews the neurophysiological basis for pitch perception in Chapters 5 and 6 and discusses the role of periodicity coding versus place coding for pitch perception. The need of an internal reference for pitch (pacemaker) in individuals with absolute pitch perception (in a few percent of musicians) is discussed. A chapter on the role of serotonin and structural organization of auditory nuclei in birds completes the first section.

The following 21 chapters are organized in four sections with regard to the anatomy of the ascending auditory pathway, and the remaining 26 chapters are organized in three sections titled "Mechanisms of Sound Localization", "Processing of Vocalization and Speech," and "Plasticity and Pathological Processes." Results of studies related to the input to the dorsal cochlear nucleus from the somatosensory system are reported in Chapter 14. Several chapters concern binaural hearing, including mapping of auditory space (31-37). Neural circuits in the cochlear nucleus and the role of the dorsal cochlear nucleus in sound localization particularly in the vertical plane is discussed in Chapter 12. Jack Kelly reviews (Chapter 31) the role of the nucleus of the lateral lemniscus in binaural processing and various research reports concerning the anatomical organization of the lateral lemniscus, the medial geniculate body, and the role of the auditory cortex for frequency discrimination. The role of the central acoustic tract of Papez is also discussed.

Coding of amplitude-modulated sounds in neurons in the auditory cortex is discussed in a chapter by Eggermont where coding of amplitude modulated sounds at different anatomical levels of the ascending auditory system is reviewed. Frisina reviews coding of amplitude-modulated sounds in the auditory nerve and the cochlear nucleus with some new data presented. Riita Hari discusses temporal coding in the auditory cortex in Chapter 30 using

magnetoencephalography and psychoacoustic data.

The role of pacemaker neurons for encoding of amplitude-modulated sounds is discussed in several chapters, as is processing of speech and other vocalizations and music in the auditory nervous system.

Several chapters are devoted to reorganization of the auditory system (Chapters 44-49) and neural plasticity in the inferior colliculus and other relay nuclei. The use of brain mapping (PET) to study neural plasticity in patients with tinnitus is reported in Chapter 48. Neuropharmacology is represented in 3 chapters, in one of which Wenthold and co-workers discuss the role of glutamate as a neurotransmitter and as a neurotoxin, together with its role in long term potentiation. The role of noradrenergic inflow on processing in the cochlear nucleus and the role of GABA in the inferior colliculus for frequency selectivity are discussed in other chapters. Two chapters (50-51) on otoacoustic emission are followed by a series of chapters on miscellaneous subjects.

Syka is to be complimented not only for editing this book but also for being able to bring together so many of the world's experts in the topics of the symposium. The book contains a wealth of valuable information, and some chapters review aspects of the auditory system that are not commonly covered. The reviews are the most valuable parts of the book but many of the research reports contain valuable and timely information.

The organization of the book is slightly confusing. Similar topics such as binaural hearing, and pitch perception are found in several places in the book, but it does not distract noticeably from the content. ❖

Aage R. Møller, PhD,
University of Texas at Dallas

Book Reviews

Medical Physiology

William F. Ganong
Stamford, CT: Appleton & Lange
1997, 829 pp., illus., index, \$36.95
ISBN: 0-8385-8443-8

It was with some trepidation that I agreed to review the latest edition of Ganong's *Review of Medical Physiology*. There were three reasons for this. First, during my postdoctoral training at UCSF, I developed a high level of respect for the author and therefore was concerned that an unbiased review would not be possible. Second, the book is a classic, now in its eighteenth edition; what further insight could I provide? Third, the book contains over 800 pages and 39 chapters; how could I possibly give a comprehensive review? Nevertheless, I forged ahead and solved the last problem by reading chapters mostly in areas that I teach or have some research expertise and by soliciting the opinions of several colleagues. What follows is largely a consensus view.

As described by Ganong in the preface, this book is "a concise summary of mammalian and, particularly, of human

physiology, which medical students and others can use...." The book begins with a review of biochemistry and cellular physiology, delves thoroughly into neurophysiology and endocrinology, and then finishes with treatments of the major organ systems. Each chapter contains numerous clear and simple two-color figures and diagrams, including original, albeit sometimes dated, research results. An inclusion of clinically relevant information is standard. The frequent use of summary tables and diagrams aids in the rapid assimilation of information. At the end of the book is a fairly extensive list of straightforward and basic learning objectives and self-study questions.

A major strength of the book is the up-to-date, comprehensive treatment of all subject areas. Indeed, it is amazing that one individual has successfully produced every two years such a broadly factual, complete, and detailed treatment of physiology. Factual errors are rare. The hallmarks of the writing are clarity, consistency, and conciseness despite the enormous amount of material presented. These features coupled with an excellent index and low cost

make the book ideal as a reference for faculty, physicians, and students.

Nevertheless, subtle differences between a "reference" and a "teaching" resource are exposed in this work. Unavoidably, some material was omitted in order to maintain the abridged nature of the book. In particular, thorough or step-wise development of explanations for some complex concepts are excluded. From a student's point of view, the text may not distinguish important from less important facts. As a result, the new student of physiology may find the text rather daunting and at times difficult to understand. However, the book definitely meets the intended goal of being a review of physiology. For that reason it is an excellent resource of current information and would be valuable for medical students studying for board exams. Moreover, it is not surprising that a casual survey of local faculty revealed fully 100% displaying at least one edition of this book on their shelves. ♦

Virginia L. Brooks
Oregon Health Sciences University

Nitric Oxide Protocols

Michael A. Titheradge (Editor)
Methods in Molecular Biology, vol. 100
Totowa, NJ: Humana, 1998,
324 pp., illus., index, \$59.50
ISBN: 0-89603-537-9

This book, consisting of 30 chapters written by 55 scientists in the field, is a significant addition to the previous publications (1-3) and provides information and methods in nitric oxide (NO) research, especially in combination with powerful techniques of molecular biology. The book covers a variety of topics: enzymology of nitric oxide synthase (NOS) (Chapter 1); purification, cloning, and expression of NOS (Chapters 2-5); various assays of NOS activity and measurements of NO pro-

duction (Chapters 6-13, 22, 26); use of NO and NO donors (Chapters 19-21, 27); inhibitors of NOS (Chapter 23); and some other related aspects (Chapters 24 & 25). The book also includes the topics of in situ and in vitro detection of NOS mRNA (Chapters 14, 15, and 18), Western blotting and immunohistochemical localization of NOS protein (Chapters 5, 16, and 17), and role of NO in protein nitrosylation, DNA-damage, and apoptosis (Chapters 28-30). Most of these topics were not covered in earlier publications (1-3).

The protocols in the book are practical and useful. The size of the book is small, suitable to carry around. More importantly, the protocols are well written to be understood. Each protocol

contains five sections: Introduction, Materials, Methods, Notes, and References. The background, purpose, and significance of each experiment are clearly and concisely laid out. All necessary materials and equipment used in the experimental procedures are indicated in considerable detail, including the source (names of companies or individuals) and even the catalog numbers convenient for ordering. One can easily obtain and prepare the materials.

The methods in this book, described precisely and specifically with step-by-step procedures and detail conditions, are easy to follow by all researchers with or without previous experience. Multiple methods are usually given to one topic, in order to suit the varying needs of individuals and availability of

Book Reviews

existing materials and/or equipment. For example, three methods are described for the in vitro detection of NOS mRNA: RT-PCR, Northern blotting, and ribonuclease protection assay (RPA). The researchers can make their own decision on the method they would like to use, based on the mRNA they obtain and the purpose of their experiments. As mentioned by Martin-Sanz and Bosca (Chapter 15), Northern blot analysis is a method whereby certain mRNA species can be isolated and detected on the basis of size when hybridized with a complementary probe. However, to distinguish between mRNA species of similar size, RPA is recommended. In addition, RPA provides a more quantitative method and allows detection of differently-splicing RNAs or transcripts with alternative-initiation sites. When only a trace amount of mRNA is obtained and is not sufficient for Northern blotting or RPA, a powerful method, RT-PCR, can be applied as described by Reiling et al. (Chapter 14). The readers can follow their instruction to detect the mRNA of human eNOS and iNOS. The same method can be used to detect all NOSs from mammals, when using specific primers for respective NOS. Furthermore, with the technique of in situ hybridization (ISH) at high sensitivity, expression of iNOS mRNA can

be detected within the tissues such as in a frozen section from a mouse with endotoxic shock according to Taylor and Cook (Chapter 18). For ISH analysis, no mRNA isolation is needed but the subpopulation of cells expressing the target mRNA is localized. The same method can be employed to detect NOS mRNA, as well as other mRNA, within the tissues, when specific probes for respective molecules are used. Most of the methods presented in this book are actually useful not only to NO research but also to other studies.

The "Notes" section is wonderful, providing a good deal of information and reasonable explanation on certain procedures and materials for the experiments. It greatly helps the performance of experiments. Some of the notes also provide useful tips on troubleshooting problems if occur.

A few authors in this book also made their contributions in previous publication (1-3) on the same topics. However, they provided updated information and modification in this book. It is nicely noticed that, based on others' report, Benjamin Hemmens and Bernd Mayer (see Fig. 2 in Chapter 1) clearly indicate the C-terminal region of NOS as NADPH binding site, which is often ignored and/or marked in the regions without experimental proof. However, a few words "two mutations of the

residues G450 and A453 in iNOS" (to be necessary for normal BH4 binding)" are missing in the legend. Table 2B in this chapter is informative but with one error—the cited reference 120 did not report the expression of mouse iNOS in baculovirus. In fact, the expression of mouse iNOS in 293 kidney cells was reported in this reference and should be added to the Table.

In summary, I think this is a good book with valuable protocols for research studies on NO and NOS. In the meantime, the readers are recommended to read the earlier publications on the same subject (1-3).

References

1. Feelisch, M., and J. S. Stamler, (Eds.). *Methods in Nitric Oxide Research*. New York: Wiley, 1996.
2. Packer, L. (Ed.). *Nitric Oxide (Part A) — Sources and Detection of NO; NO synthase*. In *Methods in Enzymology*. San Diego, CA: Academic, 1996, vol. 268.
3. Packer, L. (Ed.). *Nitric Oxide (Part B) — Physiological and Pathological Processes*. In *Methods in Enzymology*. San Diego, CA: Academic, 1996, vol. 269.

Qiao-wen Xie
Cornell Medical Center

Cellular Aspects of Smooth Muscle Function

C.Y. Kao and Mary E. Carsten (Editors).
New York: Cambridge Univ. Press, 1997, 293 pp., illus., index, \$79.95.
ISBN: 0-521-48210-0

It is often said that it is not easy to compile a volume of reviews on smooth muscle research. Because of the rapid progress in the field, chances are by the time the book is printed it is already out of date. Nevertheless, a good review

book should not only bring the readers up to date but should also provide a balanced view of the contemporary researchers. *Cellular Aspects of Smooth Muscle Function*, edited by C. Y. Kao and Mary E. Carsten, is an example of such a book. It offers a comprehensive survey of anatomical, physiological, pharmacological, and biochemical aspects of smooth muscle research. In some chapters it also serves as a practical handbook for techniques involved. This is particularly useful for readers who are not directly working in the field. Smooth muscle is a complex and

diverse system. As a result, smooth muscle research involves a wide range of entirely different training and methodology. It is difficult, if not impossible, to master all these disciplines; on the other hand, it becomes more and more clear that it is desirable, if not essential, to be aware of all the facts about the smooth muscle. Such an overall knowledge is often helpful for us to solve the problems we are dealing with in our own field. This is where this book comes in handy.

The book contains seven chapters to cover 1) the morphology, 2) calcium

Book Reviews

homeostasis, 3) ions channels, 4) electrophysiology, 5) mechanics, 6) thick filament regulation of contractility, and 7) structure and function of thin filament proteins of smooth muscle. Each chapter is neatly organized into a unit of manageable size with clear subtitles. Most authors give their perspective at the end of the chapter. An average of 200 references is provided for each subject.

The first chapter (G. Gabella) gives a concise overview of smooth muscle morphology. A good collection of electron micrographs help the readers to get a realistic grasp of smooth muscle cell ultrastructure. The author includes the numbers and sizes of various organelles and anatomical features, which I found helpful to put things in perspective. The author also points out areas that either remain controversial or need further studies, which is another useful piece of information.

Chapter 2 (J.D. Miller and M.E. Carsten) deals with the structure and function of the machinery in the sarcoplasmic reticulum and plasma membrane that are involved in the maintenance of intracellular calcium concentration. The authors give a critical review of current methodologies used in calcium measurement, pointing out the advantages and pitfalls of each technique; various experimental preparations and reagents (such as calcium indicators) were also compared, all of which are very useful. My only complaint about this otherwise superb review is that the section under the heading of "Molecular Genetics" is rather uninformative. Some references in this area would be more helpful.

In Chapter 3 C.Y. Kao uses several visceral smooth myocytes (gastrointestinal tract, uterine, and urinary tract) as examples to illustrate how ionic channels work and how the currents are measured. While the behavior of various ion channels is described in very much detail, it is somewhat left

open whether the information in this chapter can be applied to vascular smooth muscles. The complementary Chapter 4 (L.J. Janssen and S.M. Sims) reviews the electrophysiology of a more diverse type of single smooth muscle cells, but focuses only on the acetylcholine-induced excitation. The authors' remarks on the physiological roles of each type of current and the respective overviews are useful summaries of this rather chaotic field. They also point out the need of more studies on the signaling elements in order to fully understand the process of excitation-contraction coupling.

Chapter 5 (R.A. Meiss) is a complete account of smooth muscle mechanics, with a coverage ranging from classical force measurements to state-of-art techniques such as optical twizers. Readers may feel that some of the discussions tend to be superficial, but for a review of this length, breadth is probably more important than depth. Again, at the end the author summarizes the unresolved questions and calls for more work in such areas as the role of cytoskeleton, the extracellular matrix, and the attachments of smooth muscle cells to the matrix and to each other.

The final two chapters are devoted to the biochemistry of regulatory proteins in the smooth muscle contractile apparatus. While a number of excellent reviews of individual proteins already exist (e.g., Bárány's "Biochemistry of Smooth Muscle Contraction"), there is still merit to group them together so that discussion of one protein can be made without losing sight of the others. Chapter 6 (R.A. Word and K.E. Kamm) emphasizes the thick filament-based regulatory system, with a brief discussion of the mechanism of crossbridge cycling. The coverage on myosin light chain and myosin light chain kinase is very well done and very up-to-date. By comparison, the materials on myosin light chain phosphatase appear to be a little outdated, partly because this is a

fast developing field, especially in its relationship with the signaling pathway that involves rho and rho kinase. In Chapter 7, J.M. Chalovich and G. Pfitzer give a succinct, but sufficiently broad and well-balanced review on the thin filament regulatory proteins. Those who are not working in this field can get a pretty good grasp of the current status of caldesmon and calponin. Those of us who are working in this field, it is also helpful to have all the findings laid out, even when they are not always consistent, for the eventual sorting out the true functions of these proteins. It is rather intriguing that the authors list eight models for possible functions of caldesmon and calponin. One might add that even with eight possible scenarios this list may still not be complete, and that tropomyosin should not be left out, which is responsible for the cooperative properties of the smooth muscle thin filament.

The editors state in the Preface that the purpose of this book is "to encourage more studies in the field of smooth muscles." Both the complexity and diversity of smooth muscle have been blamed for keeping researchers away from these tissues. By organizing the vast current knowledge of smooth muscle into a volume of manageable size the authors of this book have done a great service to bring down this barrier. Hopefully, this will entice more investigators to embark on smooth muscle research. Equally needed are well-designed new experiments and more interdisciplinary efforts. Reading these critical chapters indeed stimulates one to try new approaches and to think more globally. This book should be recommended to all colleagues who are either working on the smooth muscle system or planning to do so.

*Chih-Lueh Albert Wang
Boston Biomedical Research Institute*

Announcements

Charles E. Culpeper Foundation Scholarships

The Charles E. Culpeper Foundation is currently accepting applications for its Year 2000 Scholarships in Medical Science Program designed to support the career development of academic physicians.

Up to four awards of \$100,000 per year for three years will be made to US medical schools or equivalent US educational institutions on behalf of candidates who are US citizens or aliens who have been granted permanent US residence (proof required); who have received their MD degree from a US medical school, or the equivalent of an MD degree from an educational institution equivalent to a US Medical School in 1991 or later (except under extraordinary circumstances, as approved by the Foundation); and who are judged worthy of support by virtue of the quality of their research proposals. All scientific research relevant to human health is eligible for

consideration. No institution may nominate more than one candidate.

In selecting awardees, emphasis will be on identifying young physicians with clear potential for making substantial contributions to science as academic physicians. Since January 1988, 37 physicians have been selected as Charles E. Culpeper Foundation Medical Scholars.

Deadline for applications is **August 16, 1999**. Awards will be announced in January 2000, for activation on or about July 1, 2000. Application forms and instructions may be obtained on the Web at www.culpeper.org or by contacting the Charles E. Culpeper Foundation at Financial Centre, 695 East Main Street, Stamford, CT 06901-2155; Tel: 203-975-1240; Fax: 203-975-1847.

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Announcements

Lake Cumberland Biological Transport Group Meeting

It is time to plan for the 1999 Lake Cumberland Biological Transport Meeting (affiliated with APS). The central theme of the meeting is biological transport, but presentations in other areas are welcome. This is an excellent forum for principal investigators, postdoctoral fellows, and graduate students alike to present their data and receive feedback.

The scientific sessions will be held in the mornings and evenings on **Sunday, June 20 to Tuesday, June 22**. Afternoons are free to enjoy swimming, fishing, golfing, riding, hiking, or any of the other activities available at the site of the meeting, Lake Cumberland State Resort Park, Jamestown, KY. ♦

For more information, contact:

Roger Worrell

Instructor

Emory Univ. Medical School

1648 Pierce Drive

Atlanta, GA 30322

Tel: 404-727-9141

Fax: 404-727-0329

E-mail:

rworrell@CCMS-renal.

physio.emory.edu

Ann Sherry

Postdoctoral Assistant

Univ. of Cincinnati

PO Box 670576

Cincinnati, OH 45267

513-558-3021

513-558-5738

ann.sherry@uc.edu

or visit the Web site at:

<http://iupucbio1.iupui.edu/cumberland/>

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Opportunities for lecturing or advanced research in nearly 130 countries are available to college and university faculty and professionals outside academe. US citizenship and the PhD or comparable professional qualifications are required. For lecturing awards, university or college teaching experience is expected. Foreign language skills are needed in some countries, but most lecturing assignments are in English.

DEADLINES:

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August 1, 1999 for lecturing and research grants in academic year 2000-2001

November 1, 1999 for international education and academic administrator seminars

January 1, 2000 for NATO advanced research fellowships and institutional grants

For more information, contact:

USIA Fulbright Scholar Program

Council for International Exchange of Scholars

3007 Tilden Street, NW, Suite 5L, Box GNEWS

Washington, DC 20008-3009

Tel: 202-686-7877

E-mail: apprequest@cies.iie.org (requests for application materials only)

Internet: www.cies.org

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Announcements

UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE

New FASEB Directory Update Procedure!

Making changes to your listing in the *FASEB Directory of Members* is just a click away.

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FASEB staff will verify your change and within a few days your new listing will appear.
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(Please NOTE: This procedure is very important for Members who do not have or choose not to list their email addresses. Please help us keep your listing current!)

UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE UPDATE

Second Federation of European Physiological Societies (FEPS)

June 30 -July 4, 1999

Prague, Czech Republic

The Final Announcement and Call for Abstracts has now been printed for the 2nd FEPS Congress.

The scientific program has been finalized and includes 7 plenary lectures, 21 symposia and 3 workshops, along with 7 poster sessions and 7 oral communication sessions. The Congress abstracts will be published in *Physiological Research*, and, in addition, the abstracts will be published in electronic form on the *Physiological Research* website.

Copies of the Final Announcement can be obtained by contacting the Congress Secretariat at:

Second FEPS Congress Secretariat
Czech Medical Association J.E. Purkyně
Sokolská 31
120 26 Prague 2, Czech Republic
TEL: +420 2 297-271 or FAX: +420 2 294 610
Email: SENDEROVA@CLS.CZ

Current information about the Congress, as well as the registration and abstract forms, is also available on the Congress web site: <http://uemweb.biomed.cas.cz/FEPS99.htm>

Congress Deadlines

Accommodation Reservation	April 30, 1999
Cancellation of Registration	June 1, 1999

Plenary Lectures

J. Bureš	G.E. Bisgard
P. Jonas	M.M. Merzenich
E. Neher	Y. Tuitou
E.R. Weibel	

Round Table

Physiome - the Future of Physiology
Chair: R.S. Reneman

Scientific Meetings and Congresses

1999

April 15-16

Biomarkers and Surrogate Endpoints: Advancing Clinical Research and Applications, Bethesda, MD.

Information: Tel: 301-468-6004; Internet: <http://www4.od.nih.gov/biomarkers>.

May 1-4

Pediatric Academic Societies' Annual Meeting (sponsored by American Pediatric Society, Society for Pediatric Research and Ambulatory Pediatric Association), San Francisco, CA.

Information: Debbie Anagnostelis, APS-SPR Central Office, 3400 Research Forest Drive, Suite B-7, The Woodlands, TX 77381. Tel: 281-419-0052; fax: 281-419-0082; email: info@aps-spr.org.

May 16-20

New World Science for the Next Millennium (sponsored by American Society for Biochemistry and Molecular Biology, Pan-American Society for Biochemistry, Canadian Society of Biochemistry and Molecular and Cellular Biology, and Division of Biological Chemistry of the American Chemical Society), Lake Tahoe, California.

Information: ASBMB Fall Symposium Office, 9650 Rockville Pike, Bethesda, MD 20814-3998. Tel: 301-530-7010; fax: 301-530-7014; e-mail: gswindle@osmc.faseb.org; Internet: <http://www.faseb.org/meetings/asbmb/jointmt.htm>.

May 20-22

1999 Conference on Hibernation and Adaptation to the Cold, Aspen Lodge at Estes Park Ranch Resort and Conference Center, Estes Park, Colorado

Information: email: kateandrews@mindspring.com; Internet: <http://www2.ncsu.edu/lowtemp/>

May 21-22

Workshop on Surgery for Movement Disorders, Toronto, Ontario, Canada.

Information: Karma Farah, Continuing Education, Faculty of Medicine, University of Toronto, 150 College Street, Room 121, Toronto, Ontario, Canada M5S 3E2. Tel: 416-978-2719; fax: 416-971-2200.

May 21-23

7th International Congress on Physical Education and Sport, Komotini, Greece.

Information: Savvas Tokmakidis, PhD, 7th International Congress on Physical Education and Sport, Department of Physical Education and Sport Science, Democritus University of Thrace, Komotini, 69100, Greece. Tel: +30-531-21764 or 21762; fax: +30-531-26908; email: stokmaki@kom.forthnet.gr; Internet: <http://platon.ee.duth.gr/~tefaa/icipes99>.

May 22-27

13th Annual Human Anatomy and Physiology Society Conference, Baltimore, MD.

Information: HAPS/OSG, 222 S. Meramec, Suite 303, St. Louis, MO 63105.

June 7-10

Critical Issues in Tumor Microcirculation, Angiogenesis and Metastasis: Biological Significance and Clinical Relevance (13th Annual Offering), Boston, MA.

Information: Carol Lyons, Administrator, Radiation Oncology, Massachusetts General Hospital, Boston, MA 02114. Tel: 617-726-4083; fax: 617-726-4172.

June 12-16

12th International Congress: International Society for Aerosols in Medicine, Vienna, Austria.

Information: Vienna Academy of Postgraduate Medical Education and Research, Alser Strasse 4, A-1090 Vienna, Austria. Tel: +43-1-405 13 83-22; fax: +43-1-405 13 83-23; e-mail: medacad@via.at

June 13-18

Society for Developmental Biology 58th Annual Meeting, Charlottesville, VA.

Information: Society for Developmental Biology, 9650 Rockville Pike, Bethesda, MD 20814. Fax: 301-571-5704; email: sdb@faseb.org; Internet: <http://sdb.bio.purdue.edu>.

June 14-15

Bioinformatics and Genome Research, San Francisco, CA.

Information: Cambridge Healthtech Institute, 1037 Chestnut Street, Newton Upper Falls, MA 02464. Tel: 617-630-1300 or 888-000-6288; fax: 617-630-1325; email: chi@healthtech.com; Internet: <http://www.healthtech.com>.

June 20-22

Lake Cumberland Biological Transport Group 37th Annual Meeting, Jamestown, KY

Information: Ann Sherry, Molecular and Cellular Physiology, University of Cincinnati, PO Box 670576, Cincinnati, OH 45267. Tel: 513-558-3021; fax: 513-558-5738; email: ann.sherry@uc.edu; Internet: <http://iupucbio1.iupui.edu/cumberland>

June 24-28

XIV International Society for Arterial Chemoreception Meeting: "Oxygen Sensing: Molecule to Man," Philadelphia, PA.

Information: Mary Pili, Department of Physiology, University of Pennsylvania Medical School, B400 Richards Bldg., 37th and Hamilton Walk, Philadelphia, PA 19104-6085. Tel: 215-898-9125; fax: 215-573-5851; email: pili@mail.med.upenn.edu.

June 27-30

Pulmonary Circulation VII, Prague, Czech Republic.

Information: Vaclav Hampl, PhD, Department of Physiology, Charles University Second Medical School, Plzenska 130/221, 150 00 Prague 5, Czech Republic. Tel: +4202-57210345; fax: +4202-57210995; Internet: <http://www.lf2.cuni.cz/departments/physiology/PCVII/index.htm>

June 30-July 4

Second Federation of European Physiological Societies (FEPS) Congress, Prague, Czech Republic.

Information: Prague Congress Secretariat, Czech Medical Association, J. E. Purkyne, P. B. 88, Sokolska 31, 120 26 Prague 2, Czech Republic. Tel: +420-2-296889 or 297271; fax: +420-2-24216836 or 294610; e-mail: Ion@czechmed.anet.cz; Internet: <http://uemweb.biomed.cas.cz/FEPS99.htm>.

July 7-8

International Conference on the Physiology and Psychology of Sport, Anchorage, Alaska.

Information: Dr. Edgar F. Pierce, Jr., Department of Health and Sport Science, Robins Center, University of Richmond, Richmond, VA 23173. Tel: 804-289-8356; fax: 804-287-8820; email: epierce@richmond.edu; Internet: <http://www.urich.edu/~mcgowan/ed1.html>.



In Appreciation ...

The American Physiological Society extends sincere appreciation to those APS Members who sponsored one or more new members to the Society during 1998.

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to 556 of you who sponsored 1 new member.

Thank you...

to 26 of you who sponsored 3-4 new members.

Thank you...

to 6 of you who sponsored 6 or more new members.

and... Welcome New Members!