

Predoc to Postdoc (P2P) Primary Transition Award (K21/K00)

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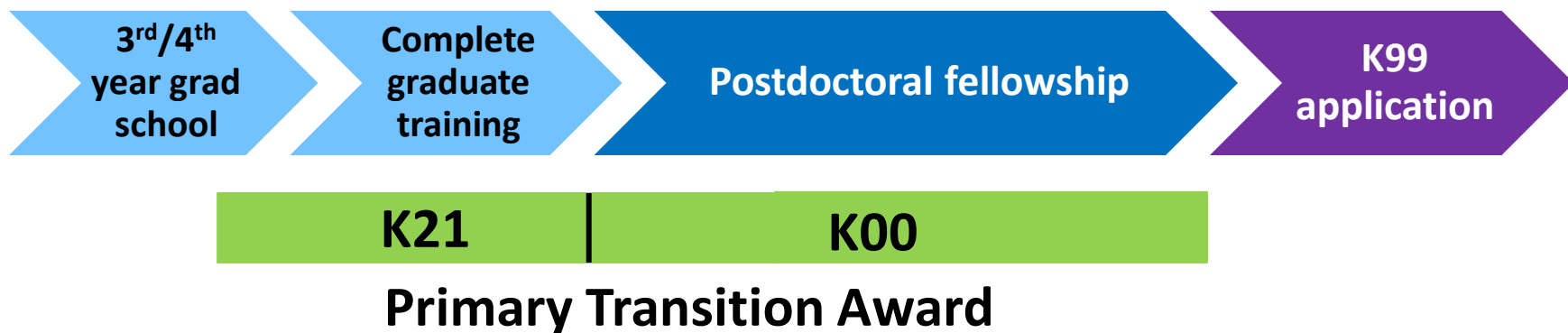
Background

- **Unsustainable biomedical workforce expansion**
- **Doubling in students receiving doctorates in basic biomedical sciences, and tripling in postdoctoral fellows in these fields**
- **Average age of 1st-time PhD PIs on R01s stabilized at 42 yrs**
- **No significant increase in open tenure-track faculty positions**
- **Bright individuals opting for careers outside academic research**

Objectives

- **Cancer research career needs to be seen as rewarding, valuable, and viable**
- **Identify best and brightest**
- **Engage and retain in cancer research community**
- **Establish new transition award for late-stage graduate students to transition to postdoctoral studies**
- **Position trainees for a K99/R00 award**

Award Elements



- **Support levels that exceed current NRSA stipends**
- **Portable and allow flexibility in selecting postdoctoral training opportunities**

Review

- **K21 application (Predoc Stage):**
 - **Quality of applicant, academic and publication record**
 - **Recommendation letters**
 - **Brief description of current research**
- **K21 to K00 transition (Postdoc Stage):**
 - **Proposal includes:**
 - **Proposed mentor's support**
 - **Short research description for postdoc training**
 - **Mentor to hold R01-equivalent grant**
 - **Approval at discretion of NCI PD**

Program Evaluation Criteria

- **Team of external educators**
- **SciENCv use**
- **Quantitative metrics**
 - **Short-term, mid-term, long-term**
 - **Productivity and bibliometrics**
- **Qualitative data**
 - **Surveys**
 - **In-depth interviews of participants, graduate student advisors, and postdoc mentors**

Program Evaluation Criteria, cont.

Quantitative Metrics

- **Short-term: PhD completion rate, time to degree, transition to K00 rate, postdoc in cancer research**
- **Mid-term: K99 application success, R00 transition rate**
- **Long-term: First RPG and R01 application success, age at first R01 award, time to tenure**
- **Bibliometrics and scientific productivity**

Program Evaluation Criteria, cont.

Qualitative Data

- **Surveys, in-depth interviews of participants**
- **Productivity measures, professional activities, leadership roles, career development activities, awards and recognition**
- **Surveys and interviews of graduate student advisors and postdoc mentors**

Justification for an RFA

- **RFA notifies extramural community of intended size and scope**
- **RFA demonstrates NCI's commitment to early career development**
- **Re-activates an existing code and develops a new transition funding program**
- **Anticipate up to 30 awards per year**

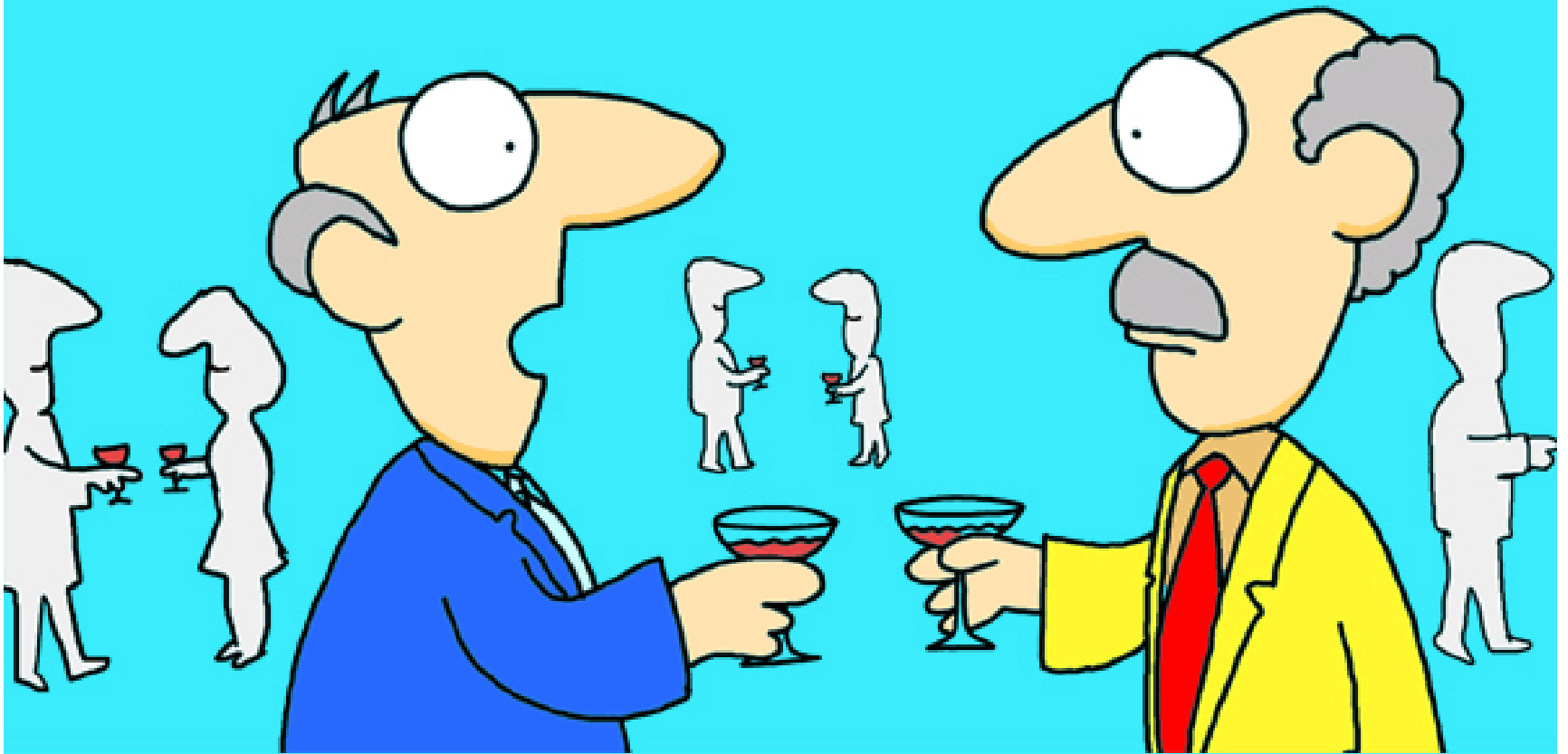
Budget Proposal

30 awards per year; total cost for RFA is 51M

- **Propose one receipt date per year for five years**
- **Each cohort will cost \$10.2M**
- **Salary (\$30,000) and tuition (\$16,000) for grad students gives a cost of \$46,000 per year. Costs also include \$1,500 per year for travel to NCI meetings.**
- **Salary for postdocs starts at \$50,000 and increases to \$60,000 by year six. Costs include \$5,000 per year for tuition and \$1,500 per year for travel to NCI meetings.**



Questions?



“I have trained dozens of Postdocs.
One of them even got a faculty position!”

Program Framework

K21

K00

3rd/4th
yr grad
school

Complete
graduate
training

Postdoctoral fellowship

K99
application

Quantitative metrics

Inputs

- Applicant characteristics and demographics
- Mentor characteristics and demographics
- Budget for 30 awards/yr

Activities

- Complete PhD
- Participate in annual NCI workshop
- Transition to K00
- Participate in scientific and professional development activities to be positioned to apply for K99

Short-term Outcomes

- PhD completion rate
- Time to degree
- Transition rate to K00
- Postdoc research in cancer field
- Scientific productivity

Mid-term Outcomes

- Success rates for K99/R00
- Transition to R00
- Continuation in cancer research field
- Scientific productivity

Long-term Outcomes

- Success rates for first RPG and R01
- Age at first R01-equivalent award
- Time to tenure
- Continuation in cancer research field
- Scientific productivity

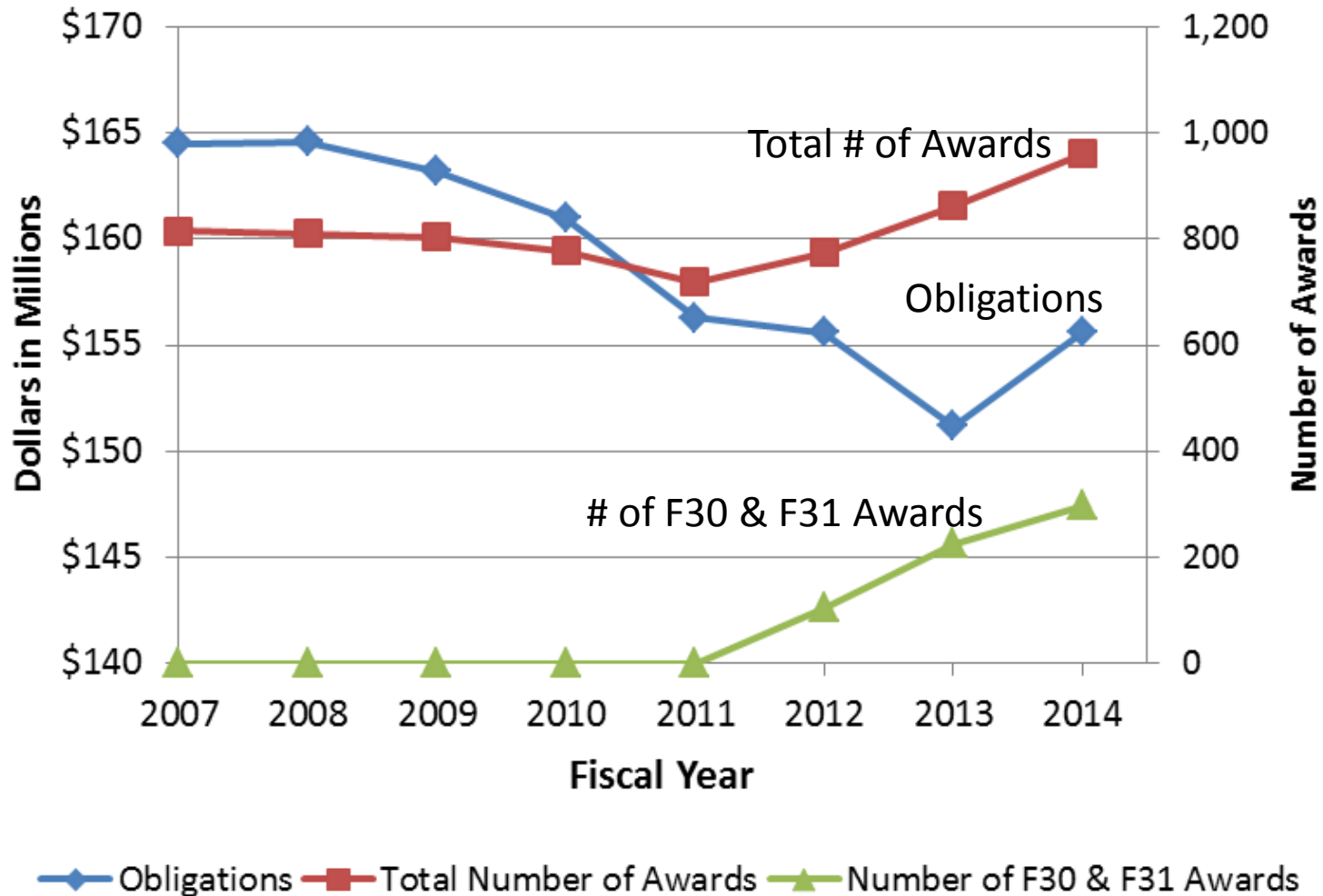
Impact

- Established clear pathway for research independence
- Compressed timeline to independence
- Best and brightest retained in cancer research

Evaluated qualitatively throughout the program through surveys and in-depth interviews of trainees and mentors

- Career development
- Leadership roles
- Mentorship
- Scientific training
- Productivity/accomplishments
- Professional identity

CTB Budget and Awards



Allocation for FY15 is ~\$155M.

CTB Funding History

Grants funded in FY11 - FY14:

FY 2011						FY 2013					
MECH	# OF APPS	APPS FUNDED	PAYLINE	SUCCESS RATE	DOLLAR AMOUNT	MECH	# OF APPS	APPS FUNDED	PAYLINE / %TILE	SUCCESS RATE	DOLLAR AMOUNT
F30	N/A	N/A	N/A	N/A	N/A	F30	110	42	24	38%	\$2,550,528
F31	N/A	N/A	N/A	N/A	N/A	F31	299	83	30	28%	\$4,096,504
F32	288	60	27	21%	\$3,306,500	F32	268	54	29	20%	\$3,219,000
T32	84	33	24	39%	\$12,300,479	T32	68	16	26	24%	\$5,957,786
K05	8	5	24	63%	\$788,307	K05	13	2	22	15%	\$175,848
K07	69	15	27	22%	\$2,265,560	K07	77	21	31	27%	\$3,152,774
K08	84	28	23	33%	\$4,486,875	K08	61	16	30	26%	\$2,697,822
K12	9	4	24	44%	\$2,584,390	K12	11	5	22	45%	\$3,960,014
K18	3	1	14	33%	\$117,208	K18	1	0	20	0%	\$0
K22	23	3	22	13%	\$521,988	K22	49	4	23	8%	\$637,061
K23	40	8	27	20%	\$1,324,270	K23	32	4	26	13%	\$659,658
K24	4	1	21	25%	\$198,671	K24	7	2	20	29%	\$337,469
K25	25	3	20	12%	\$294,911	K25	13	4	24	31%	\$679,368
K99	158	32	27	20%	\$3,536,010	K99	135	34	32	25%	\$2,883,645
R25E	45	9	21	20%	\$2,794,409	R25E	54	13	25	24%	\$3,688,017
R25T	20	8	24	40%	\$3,612,778	R25T	14	5	20	36%	\$2,180,278
TOTAL	860	210			\$38,132,356	TOTAL	1212	305			\$36,875,772
FY 2012						FY 2014					
MECH	# OF APPS	APPS FUNDED	PAYLINE / %TILE	SUCCESS RATE	DOLLAR AMOUNT	MECH	# OF APPS	APPS FUNDED	PAYLINE / %TILE	SUCCESS RATE	DOLLAR AMOUNT
F30	124	35	29	28%	\$1,243,099	F30	84	40	32	48%	\$1,936,512
F31	307	72	28	23%	\$2,343,949	F31	279	92	33	33%	\$3,843,112
F32	261	57	29	22%	\$2,386,500	F32	229	57	29	25%	\$3,108,000
T32	73	27	25	37%	\$8,642,033	T32	58	21	30	36%	\$9,085,647
K05	14	3	30	21%	\$463,838	K05	8	3	20	38%	\$271,884
K07	79	6	30	8%	\$596,388	K07	68	12	30	18%	\$1,558,274
K08	53	18	29	34%	\$2,379,042	K08	60	11	30	18%	\$1,815,608
K12	6	3	26	50%	\$1,674,392	K12	6	2	13	33%	\$1,603,891
K18	2	0	N/A	0%	\$0	K22	99	25	32	25%	\$4,169,228
K22	27	2	27	7%	\$142,560	K23	26	5	29	19%	\$835,175
K23	26	6	27	23%	\$473,726	K24	5	4	20	80%	\$752,172
K24	10	5	20	50%	\$964,282	K25	12	4	33	33%	\$629,908
K25	19	2	30	11%	\$243,207	K99	175	47	31	27%	\$5,809,093
K99	171	33	32	19%	\$3,119,543	R25E	33	10	23	30%	\$2,365,934
R25E	46	12	24	26%	\$2,909,208	R25T	15	9	25	60%	\$3,371,579
R25T	19	10	23	53%	\$4,564,530	R13	1	1	29	100%	\$79,995
TOTAL	1237	291			\$32,146,297	TOTAL	1158	343			\$41,236,012

NRSA Funding History

	2010		2011		2012		2013		2014	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
T32	385	811	377	819	318	731	291	645	285	650
F30	-	-	-	-	34	-	79	-	110	-
F31	-	-	-	-	70	-	150	-	202	
F32	-	134	-	108	-	110	-	117	-	111
Total	385	945	377	927	422	841	520	762	597	761
Trainees	1330		1304		1263		1282		1358	
\$	\$61.6m		\$62.4m		\$60.6m		\$60.2m		\$65.7m	

Summary

FY for K99	K99 success rate (NCI)	# of new awards	# of awardees that have transitioned to R00	%R00/K99	Adjusted %R00/K99	Median Time from K99 To R00 (Months)	# of awardees with R01 (s)	%R01/R00	%R01/K99	Median Time from R00 To R01 (Months)
2007	12%	20	20	100.00%	100.00%	24.0	15 (3)†(2)**	75.00%	75.00%	33.9
2008	33%	34	30 (+2)*	88.24%	94.12%	23.5	14	46.67%	41.18%	44.0
2009	24%	24	20 (+3)*	83.33%	95.83%	23.3	6 (2)†	30.00%	25.00%	36.8
2010	22%	32	30 (+1)*	93.75%	96.88%	24.0	5 (1)†	16.67%	15.63%	18.6
2011	23%	35	29 (+2)*[2]#	82.86%	88.57%	22.5	1	3.45%	2.86%	21.7
2012	17%	25	19 (+1)*[3]#	76.00%	80.00%	16.4	1	5.26%	4.00%	21.0
2013	25%	33	9 {24}‡	27.27%		15.3	1	11.11%	3.03%	2.9
2014	23%	47	0 {47}‡	0.00%			0			
2007-2014	22%	250	157 (+9)	62.80%	66.40%	23.4	43 (8)†	27.39%	17.20%	

8 of them received 2 R01 awards.

*: the number in () indicates the K99 awardees who obtained tenure-track equivalent position without R00 awarded (detailed information was provided in Page 5)

#: the number in [] indicates the K99 awardees those are on a no cost extension.

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†: the number in () indicates the K99 awardees who had 2 R01s.

** : the number in () indicates the K99 awardees who had 3 R01s. For both of them, the recent R01 received in 2014 were type 2

Summary of K99 Outcomes

FY for K99	K99 success rate (NCI)	# of new awards	# of awardees that have transitioned to R00	%R00/K99	Adjusted %R00/K99	Median Time from K99 To R00 (Months)	# of awardees with R01 (s)	%R01/R00	%R01/K99	Median Time from R00 To R01 (Months)
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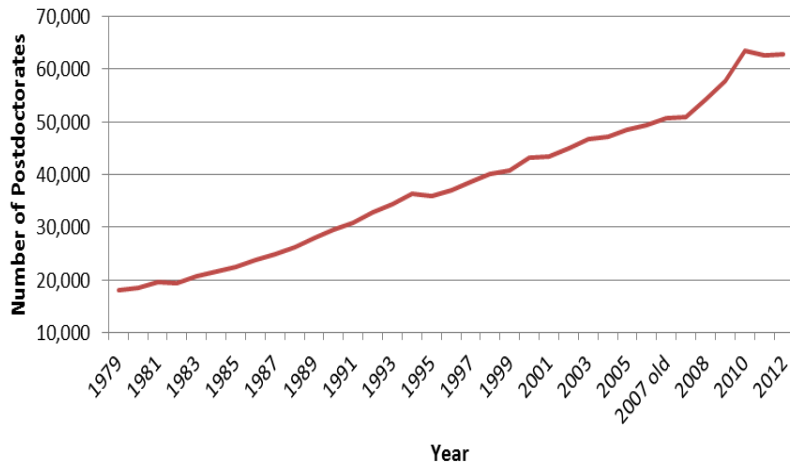
Applicant Pool

- NCI supports >2,000 graduate students

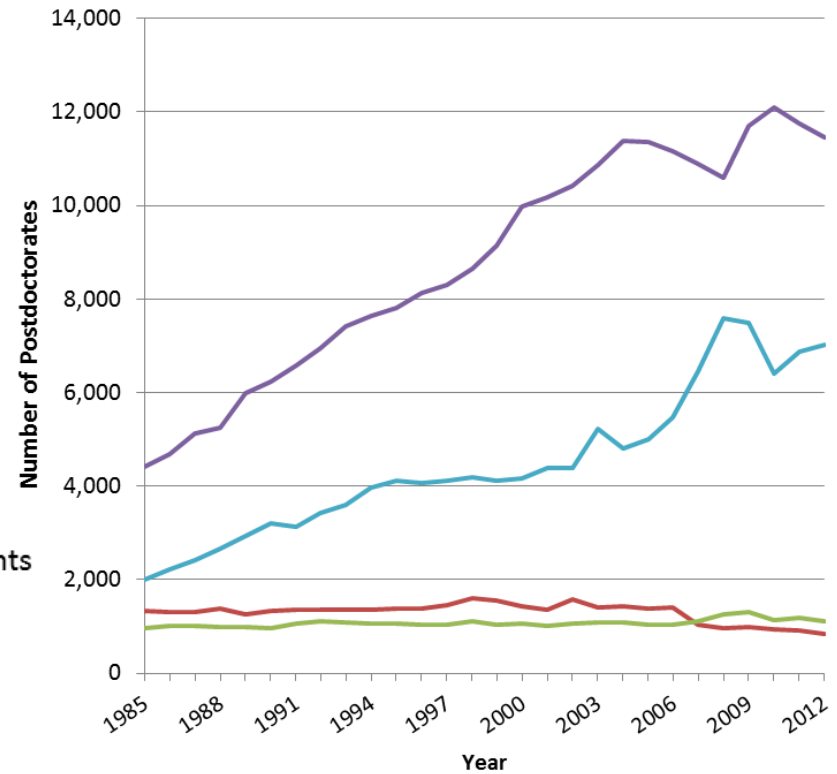
Mechanism	Number of students
F30, F31 (individual)	215
T32 (institutional)	370
Research grants	1,500
University resources	?

Postdoctorates in the U.S.

Postdoctorates in science, engineering, and health



Biomedical science postdoctorates by source of support

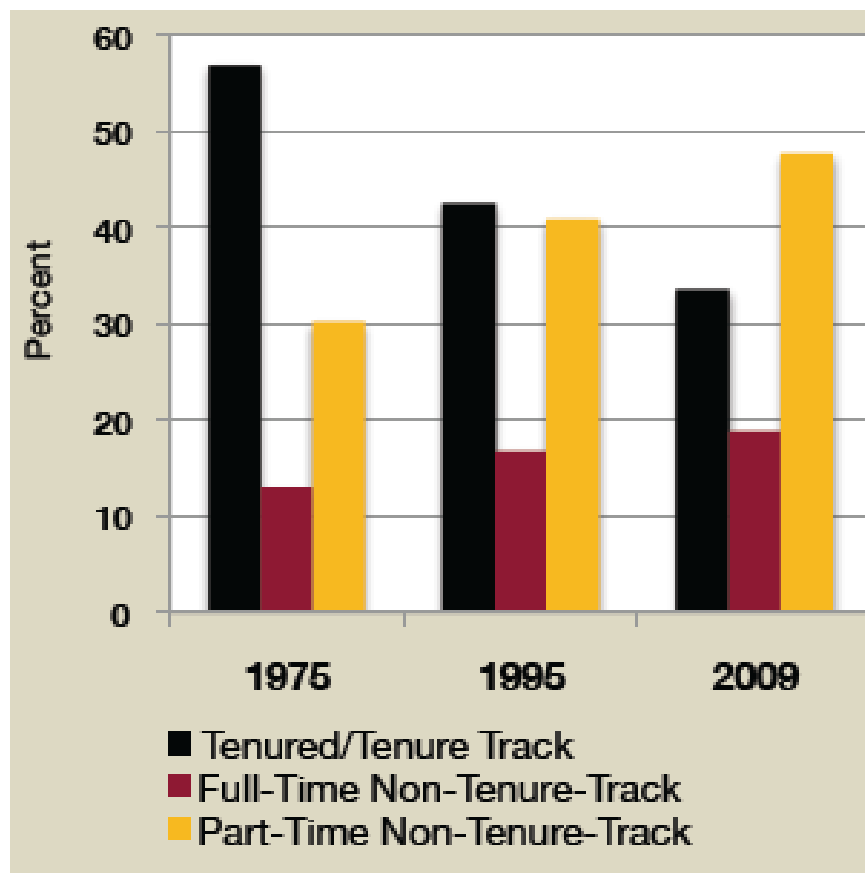


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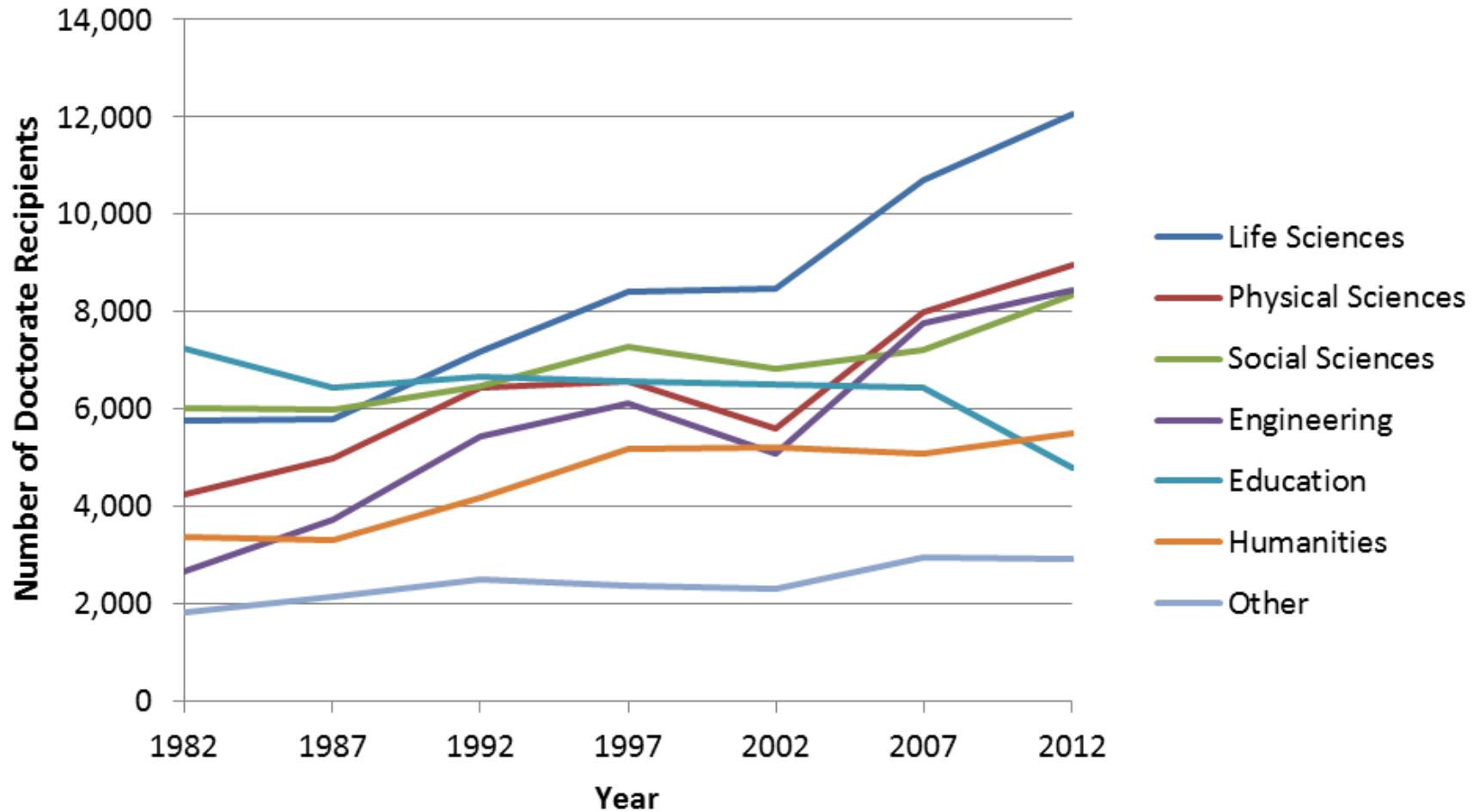
Source: NSF Survey of Doctorate Recipients

Changing Composition of the Academic Workforce



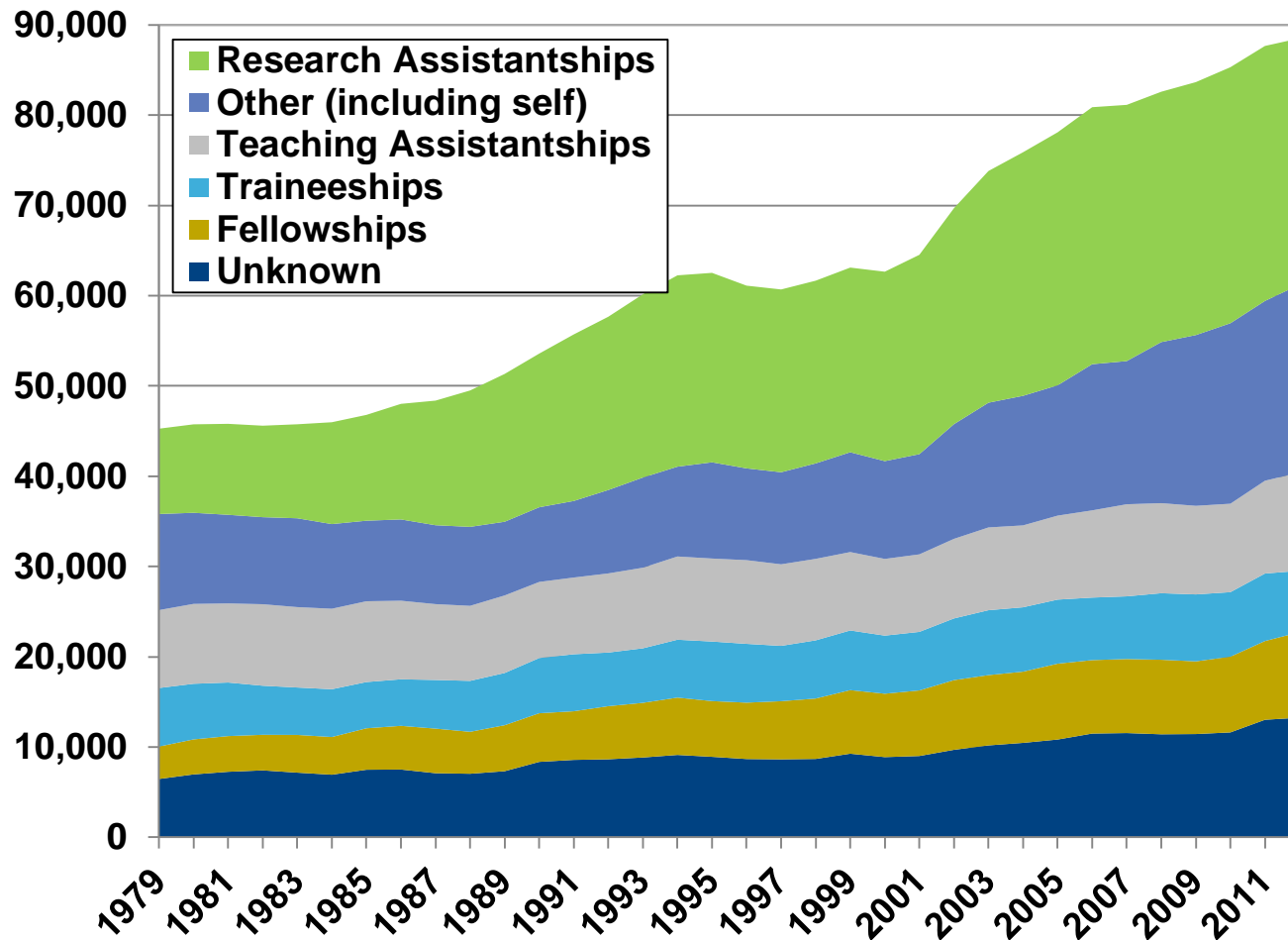
Source: American Association of University Professors, 2010; American Federation of Teachers Higher Education Data Center, 2010. Data were derived from National Center for Education Statistics Integrated Postsecondary Education Data System Surveys.

Increasing Numbers of U.S. Doctorate Recipients in Life Sciences



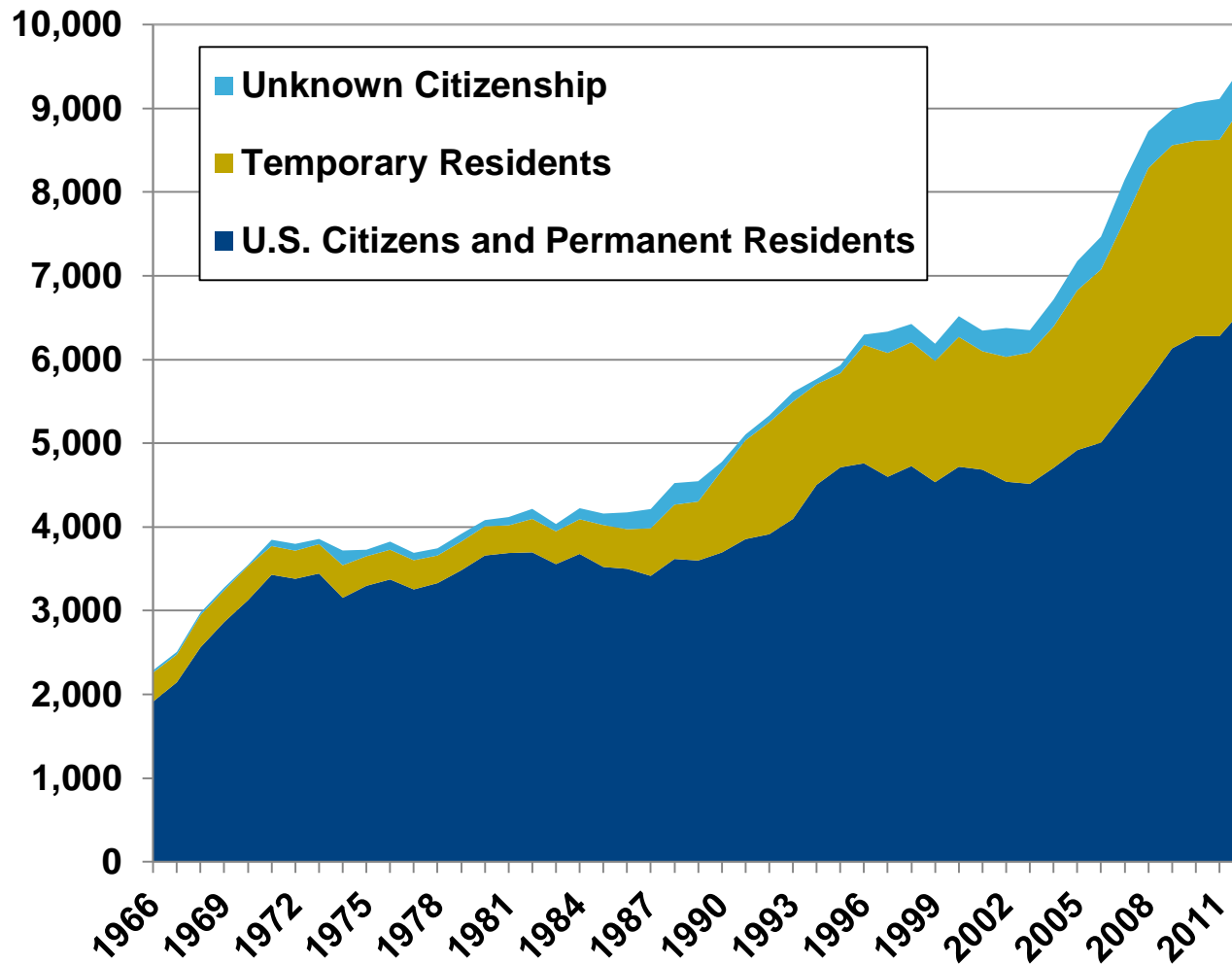
Source: NSF Survey of Earned Doctorates

Full Time Biological and Medical Sciences Graduate Students in Doctorate Granting Departments by Mechanism of Support



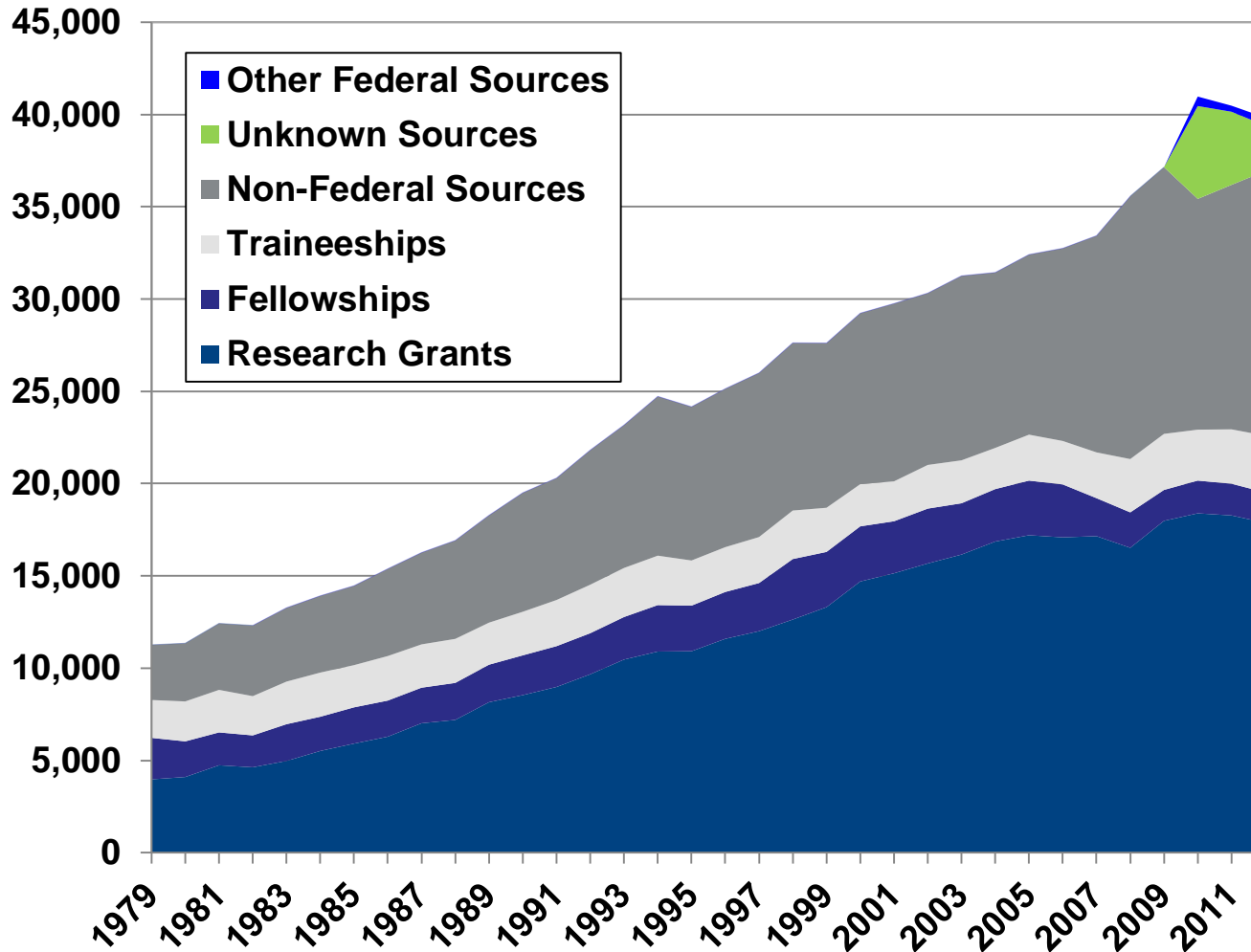
Source: <http://www.nsf.gov/statistics/gradpostdoc/>

Doctorate Degrees Awarded in the Biological and Medical Sciences by Citizenship/Visa Status



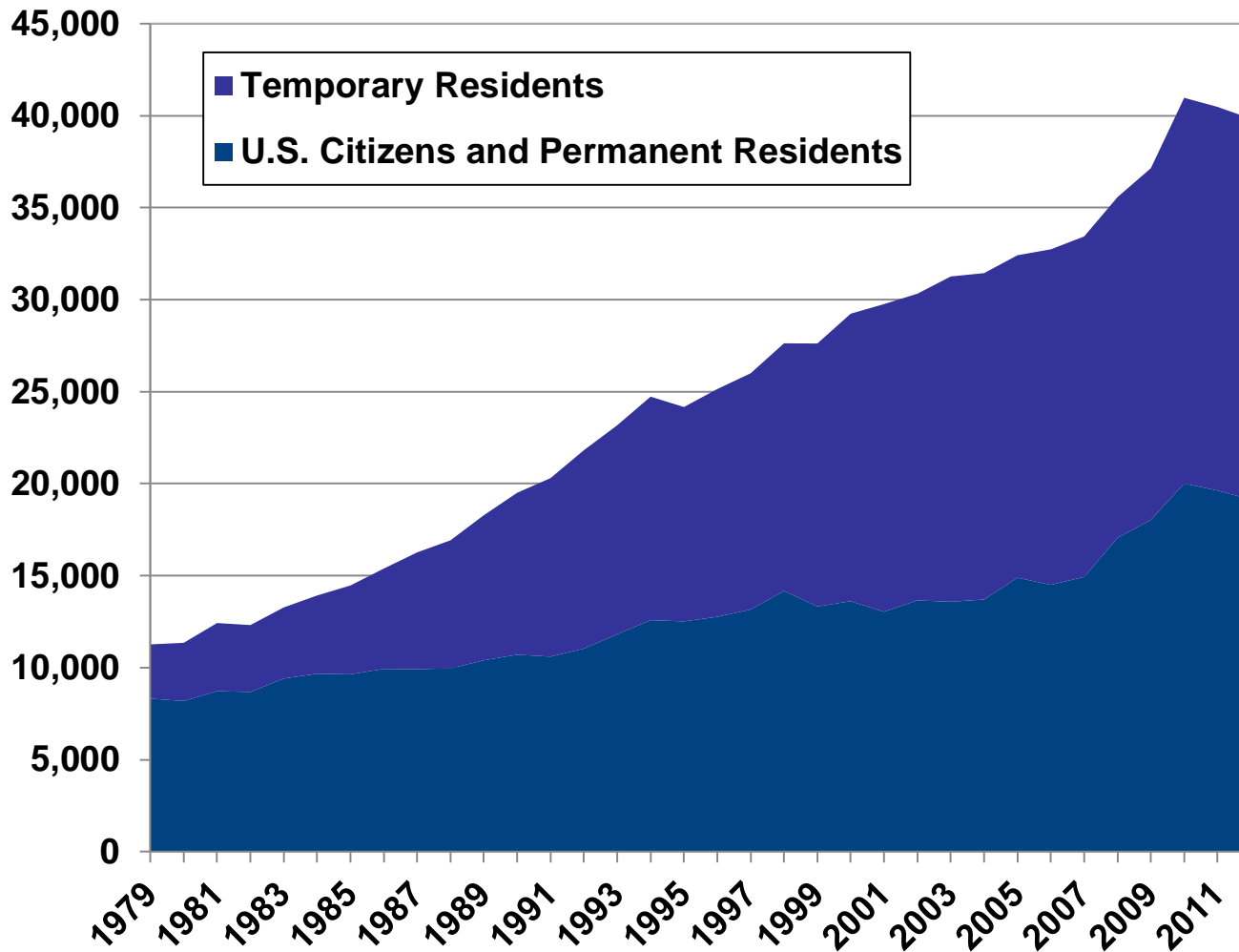
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Biological and Medical Sciences Postdocs by Source of Support



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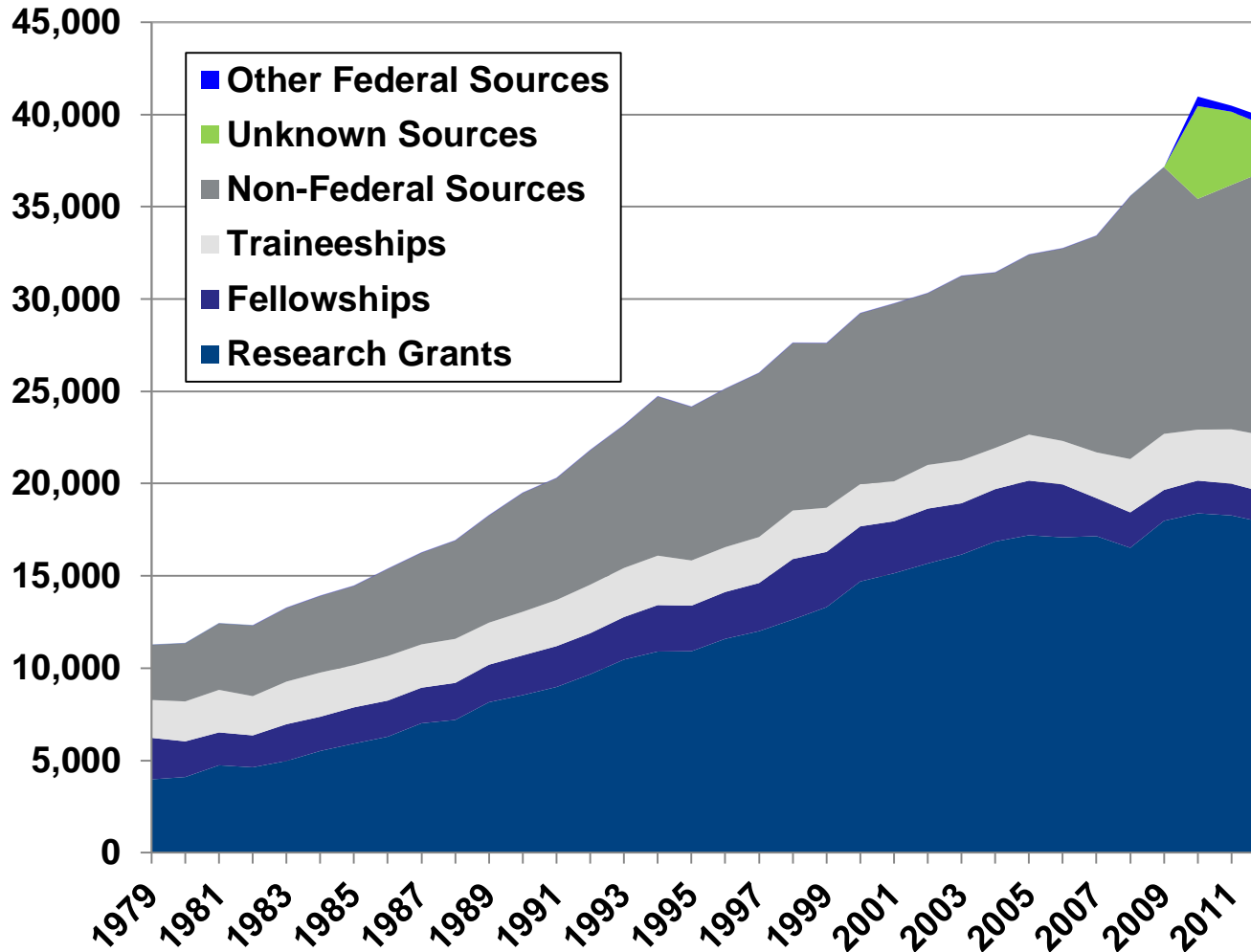
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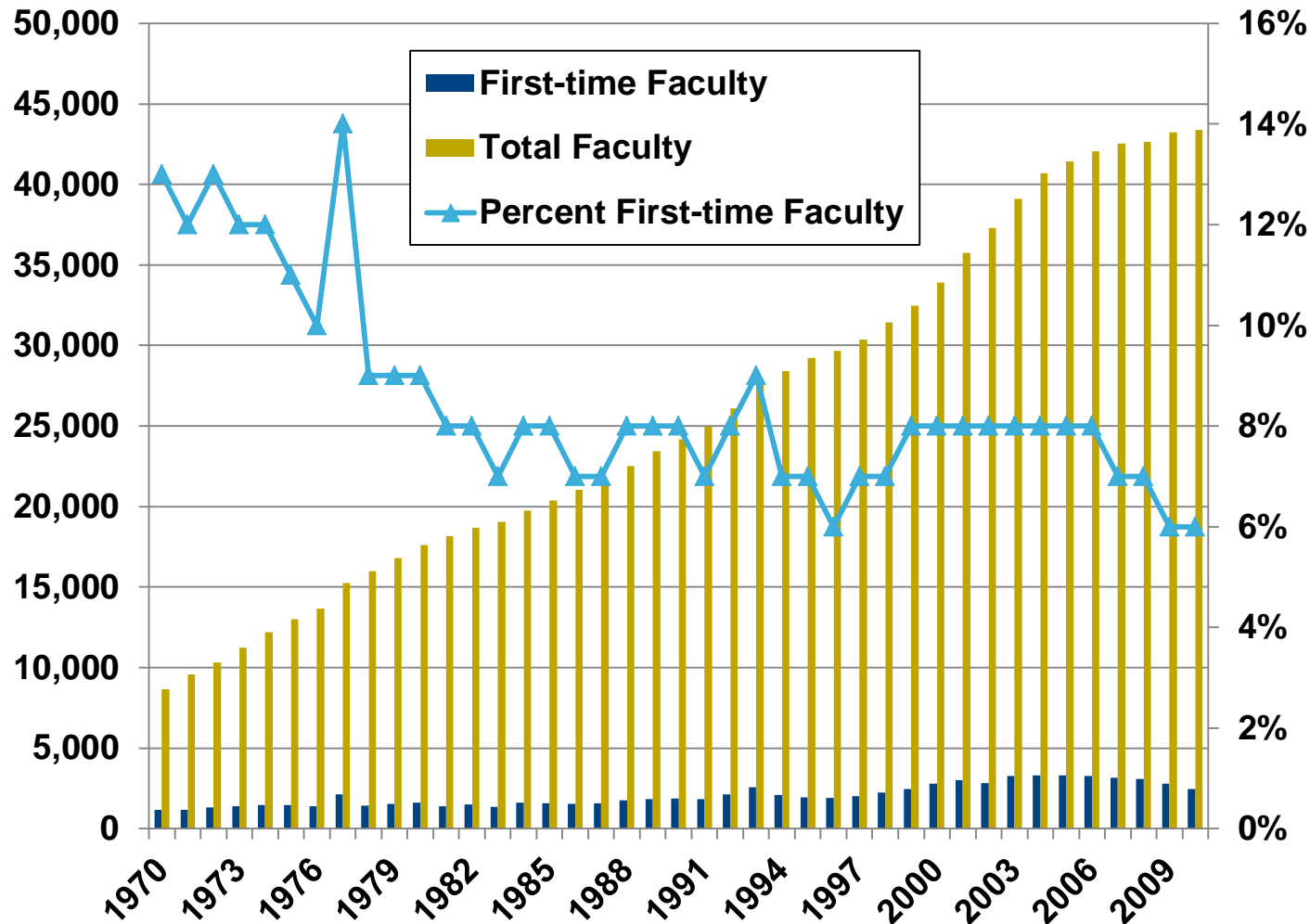
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Biological and Medical Sciences Postdocs by Source of Support

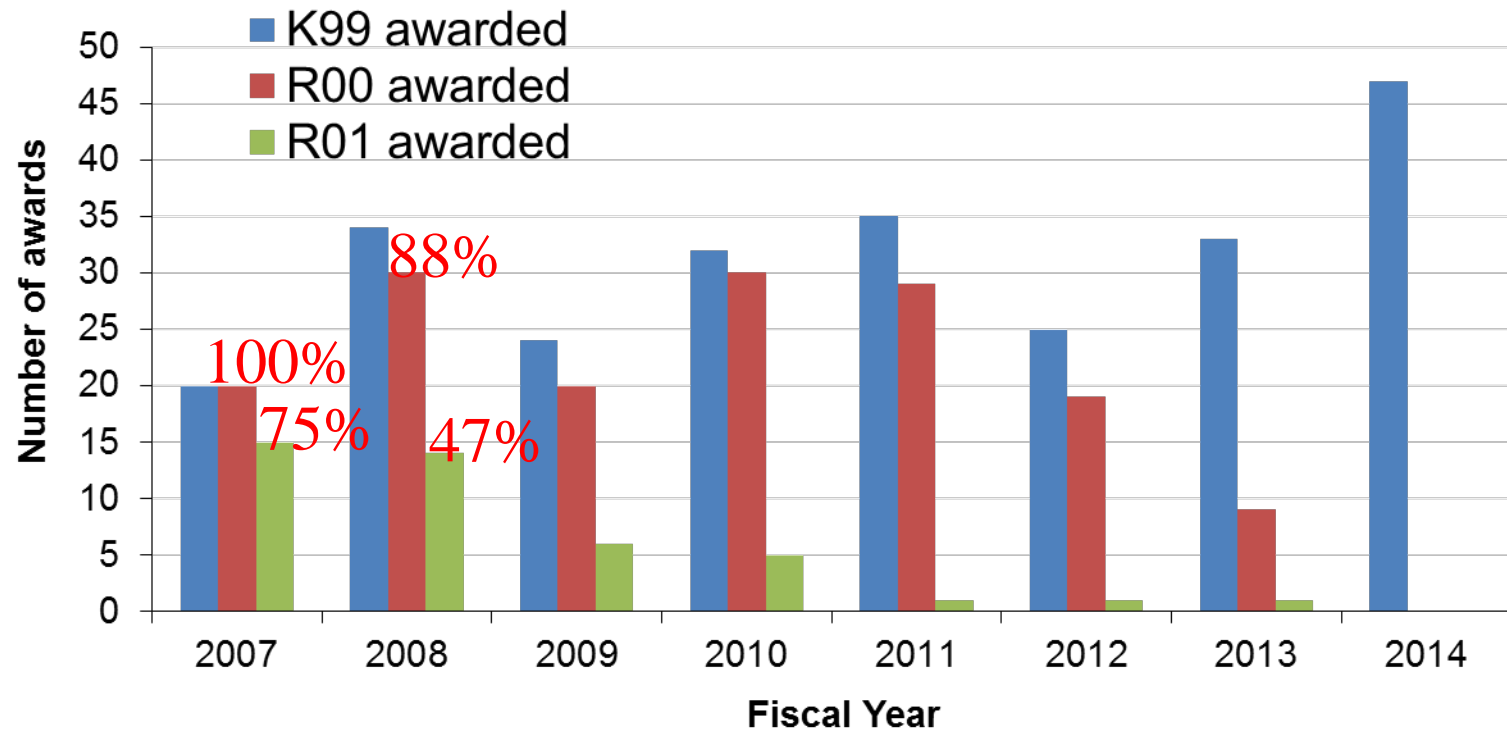


Source: <http://www.nsf.gov/statistics/gradpostdoc/>

Total and New Full-Time Faculty 1970 to 2010 in US Medical Schools with Ph.D. or equivalent degree (includes M.D./Ph.D.)



Number of K99 awardees who transitioned to R00, and/or received R01 (FY2007-FY2014)



-- This figure was drawn from the summary Table in Page 2. For example, there were 20 new K99 awards in FY2007. Among these awardees, all of the 20 were transitioned to R00 successfully; 15 of them had R01 awards as of FY 2014.

-- Most of the FY2013 & FY2014 K99 awards are still active.

-- Considering the median time to get R01 from R00 is 3-4 years plus ~2-year K99 before R00, the number of R01 awards will continue to increase over time.