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# Characteristics of research tracks in dermatology residency programs: a national survey

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## Abstract

Pursuing research is encouraged in dermatology residency programs. Some programs offer specific research or investigative tracks. Currently, there is little data on the structure or scope of research tracks in dermatology residency programs. An anonymous online survey was distributed to the Association of Professors of Dermatology listserve in 2016. Program directors of dermatology residency programs in the United States were asked to participate and 38 of the 95 program directors responded. The survey results confirmed that a 2+2 research track, which is two years of clinical training followed by two years of research, was the most common investigator track model and may promote an academic career at the resident's home institution. Further studies will help determine the most effective research track models to promote long-term outcomes.

*Keywords: research, graduate medical education, residency*

## Introduction

Developing the next generation of investigative dermatologists is a priority for dermatology residency programs [1] and some programs offer specific investigative tracks for interested trainees. Per the American Board of Dermatology, a total of 2.25 years of clinical training is needed in order to satisfy dermatology residency requirements [2]. Currently, there is little data on the structure or scope of research tracks in dermatology residency programs. The objective of this study was to understand the

characteristics and organization of research tracks among dermatology residency programs.

## Methods

An anonymous online survey created using Survey Monkey (www.surveymonkey.com) was distributed to the Association of Professors of Dermatology listserve. The survey questions are included in the appendix. Thirty-eight of the 95 program directors of dermatology residency programs in the United States responded (40% response rate). Statistical analysis was performed using SPSS version 24.0 (SPSS Inc., Chicago, IL, USA). This study was approved by the University of California, San Diego Institutional Review Board.

## Results and Discussion

Sixteen (42%) of the program directors indicated that they offered a formal research track (**Table 1**). Of these, the 2+2 research track was the most common model (69%), which consists of two years of clinical training followed by two years of research. An interest in research was the most important criteria for selecting residents for a research track, followed by the number of publications and the impression of the interviewers on the interview day. The department or division provided the majority of funding used to support research residents; half of programs provided extramural funding through T32 National Institutes of Health institutional training grants. T32 grants are awarded to institutions and enable residency programs to select and fund postdoctoral candidates for research training. The majority of programs expected the research resident to participate in grand rounds (88%), didactics (63%),

**Table 1.** Comparison of Dermatology Residency Programs With and Without Research Tracks, 2016<sup>a</sup>

	No Research Track (n=22)	Research Track (n=16)
Total residents in program, mean (SD)	10 (4)	16 (3)
Total residents in research track, mean (SD)	1 (1)	2 (1)
Important criteria when selecting research track applicants		
Number of publications	1 (33)	6 (38)
Number of grants	0 (0)	1 (6)
Interview day	0 (0)	6 (38)
Interest in particular lab	1 (33)	5 (31)
Interest in research	1 (33)	8 (50)
Minimum requirements expected of the resident		
Minimum in-service score	0 (0)	1 (7)
Meets milestones	3 (75)	12 (90)
Solid research proposal	1 (25)	2 (13)
Academic year residents enter the track with dedicated research time		
PGY2	0 (0)	2 (12)
PGY3	1 (50)	6 (38)
PGY4	1 (50)	8 (50)
Years of clinical time residents get by graduation		
2.25	0 (0)	9 (60)
2.5	1 (25)	4 (27)
2.75	1 (25)	1 (7)
3	2 (50)	1 (6)
>3	0 (0)	0 (0)
Additional responsibilities for research residents compared to classmates? <sup>b</sup>		
Yes	0 (0)	3 (19)
No	4 (100)	13 (81)
Expected participation during dedicated research time		
Grand Rounds	2 (100)	14 (88)
Didactics	2 (100)	10 (63)
Weekly clinic	2 (100)	15 (94)
Residents take the ABD board exam after which academic year		
PGY4	3 (100)	11 (69)
PGY5	0 (0)	4 (25)

	No Research Track (n=22)	Research Track (n=16)
Either	0 (0)	1 (6)
Funding to support research track residents		
Department/Division funds	2 (67)	10 (63)
University	1 (33)	4 (25)
T32 grant	0 (0)	8 (50)
Other grant	0 (0)	2 (13)
Philanthropy	0 (0)	1 (6)
Percentage (SD) of residents that stay on as PI five years after graduation <sup>c</sup>	22 (44)	27 (31)

Abbreviations: n, number; PGY, post-graduate year; PI, principal investigator; SD, standard deviation.

<sup>a</sup>Data presented as number (%) except where indicated. Denominator used to calculate percentages based on the number of respondents for each question. Student's t-test for continuous variables and Fisher's exact test for categorical variables were performed. There were no statistically significant differences, except for the total number of residents ( $p$ -value<0.001).

<sup>b</sup>Additional responsibilities include inpatient consults, weekend/night call, continuity clinic, and general dermatology clinic.

<sup>c</sup>Response to the question: "Over the last 10 years, what percentage of your research track residents have remained at your institution as a principal investigator past 5 years of graduation?"

and weekly clinic (94%) during dedicated research time. Eighty-one percent of programs did not have additional clinical responsibilities for their research residents compared to co-residents. All research track programs meet the American Board of Dermatology requirement for minimal clinical time received by graduation. Sixty-nine percent of research track programs indicated that their residents take the American Board of Dermatology board exam after postgraduate year 4, 25% take it after postgraduate year 5, and the rest take it after either year.

Ninety percent of program directors report that the research resident must meet the outcomes-based milestones outlined by the Accreditation Council for Graduate Medical Education. A minimum annual in-training examination score was not considered as a criterion for the research resident to enter the research track.

Previous studies indicated that the percentage of dermatology residents pursuing an academic career increased significantly over the last decade [3] and that residents with research experience were more likely to pursue careers in academic medicine [4, 5]. When stratified into types of tracks, our data suggests that a higher proportion of residents in a

2+2 track remain at their home institution at least five years after graduation ( $P=0.06$ , **Table 2**), [6]. Some programs have features that may promote a long-term career at the institution, including the allotment of faculty privileges in the last year of training and salary increases.

## Conclusion

These results indicate that a 2+2 track may be the most common training model for physician scientists in dermatology and may promote academic careers at the resident's home institution. Most research track programs are funded by department or division and T32 grants. Research track residents are expected to participate in common clinical and educational activities and must meet Accreditation Council for Graduate Medical Education milestones as determined by their Clinical Competency Committees. Although this study provides information regarding the current characteristics of research tracks in dermatology residency programs, further studies will help determine the most effective research track models to promote long-term outcomes such as academic retention, scientific productivity, grant funding, and promotion.

**Table 2.** Survey Response Stratified by Type of Research Track<sup>a,b</sup>

	3 Year (n=1)	3 + Extra Research Years (n=4)	2+2 (n=9)	Other (n=2) <sup>c</sup>
Total residents in program, mean (SD)	19 (NA)	16 (4)	16 (3)	19 (0)
Total residents in research track, mean (SD)	2 (NA)	2 (2)	1 (1)	1 (0)
Important criteria when selecting research track applicants				
Number of publications	0 (0)	0 (0)	5 (56)	1 (50)
Number of grants	0 (0)	0 (0)	1 (11)	0 (0)
Interview day	0 (0)	1 (25)	4 (44)	1 (50)
Interest in particular lab	1 (100)	0 (0)	4 (44)	0 (0)
Interest in research	0 (0)	3 (75)	3 (33)	2 (100)
Minimum requirements				
Minimum in-service score	0 (0)	0 (0)	1 (11)	0 (0)
Meets milestones	1 (100)	2 (67)	7 (78)	2 (100)
None	0 (0)	1 (33)	1 (11)	0 (0)
Academic year residents enter the track with dedicated research time				
PGY2	0 (0)	1 (25)	1 (11)	0 (0)
PGY3	1 (100)	2 (50)	2 (22)	1 (50)
PGY4	0 (0)	1 (25)	6 (67)	1 (50)
Years of clinical time by graduation				
2.25	NA	1 (35)	6 (67)	2 (100)
2.5	NA	2 (50)	2 (22)	0 (0)
2.75	NA	0 (0)	1 (11)	0 (0)
3	NA	1 (25)	0 (0)	0 (0)
Additional responsibilities compared to classmates? <sup>d</sup>				
Yes	0 (0)	2 (50)	1 (11)	0 (0)
No	1 (100)	2 (50)	8 (89)	2 (100)
Expected participation during dedicated research time				
Grand Rounds	1 (100)	4 (100)	7 (78)	2 (100)
Didactics	1 (100)	3 (75)	5 (56)	1 (50)
Weekly clinic	1 (100)	4 (100)	8 (89)	2 (100)
Residents take ABD board exam after which academic year				
PGY4	1 (100)	4 (100)	4 (44)	2 (100)
PGY5	0 (0)	0 (0)	4 (44)	0 (0)

	3 Year (n=1)	3 + Extra Research Years (n=4)	2+2 (n=9)	Other (n=2) <sup>c</sup>
Either	0 (0)	0 (0)	1 (11)	0 (0)
Funding to support research residents				
Department/Division funds	0 (0)	4 (100)	5 (56)	1 (50)
University	0 (0)	1 (25)	2 (22)	1 (50)
T32 grant	0 (0)	1 (25)	5 (56)	2 (100)
Other grant	0 (0)	0 (0)	1 (11)	1 (50)
Philanthropy	1 (100)	0 (0)	0 (0)	0 (0)
Percentage (SD) of residents that stay on as PI five years after graduation <sup>e</sup>	0 (0)	8 (14)	25 (28)	75 (21)

Abbreviations: CCC, clinical competency committee; n, number; NA, not available; PGY, post-graduate year; PI, principal investigator; SD, standard deviation.

<sup>a</sup>Data presented as number (%) except where indicated. Denominator used to calculate percentages based on number of respondents for each question. Analysis of variance (ANOVA) for continuous variables and Fisher's exact test for categorical variables were performed.

<sup>b</sup>Three separate research track programs are listed on the Electronic Residency Application Service: University of California, San Francisco (2+2), Mayo Clinic College of Medicine and Science Rochester (3+1 extra year), and University of California, Los Angeles (5-year STAR).<sup>6</sup>

<sup>c</sup>Flexible research pathway model, including both 2+2 and 3+1 extra year options.

<sup>d</sup>Additional responsibilities include inpatient consults, weekend/night call, continuity clinic, and general dermatology clinic.

<sup>e</sup>Response to the question: "Over the last 10 years, what percentage of your research track residents have remained at your institution as a principal investigator past 5 years of graduation?" The result approached statistical significant (p-value = 0.06).

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## Appendix

### Research Tracks Survey Instrument

An anonymous survey created with SurveyMonkey was distributed to the Association of Professors of Dermatology listserv. Program directors of Accreditation Council for Graduate Medical Education-accredited dermatology residency programs in the United States were asked to participate.

1. Does your residency program support research-in-interested residents with a distinct training plan or schedule?

Yes

No (please continue the survey even if you do not have a distinct resident research training schedule)

2. Please specify the type of training plan or schedule. Check all that apply.

Regular 3 year training program

Regular 3 year training program + extra research years

2+2 training program (separate match)

2+2 training program (residents opt-in after matriculating in residency)

Other (please specify)

3. What number of residents per year, on average, participate in the research training program?

1

2

3

4

5

6

4. How many total residents are in your residency program?

1-3

4-6

7-9

10-12

13-15

16-18

>18

5. When are the residents chosen to be a part of the

research track?

At interviews

PGY2 year

PGY3 year

PGY4 year

6. Which of the following are important criteria in selecting residents for participation in the research track?

Check all that apply.

Number of publications

Number of grants

Strength of their research presentation on interview day

Interview day

Interest in joining a lab within the dermatology department/ division

Other (please specify)

7. Are applicants to the research track asked to present their research during the interview day?

Yes

No

Other (please specify)

8. What are the minimum requirements expected of the resident in the research track?

Minimum in-service score

Meets milestone requirements

None

9. In what academic year do your residents enter the research track with dedicated research time?

PGY2

PGY3

PGY4

PGY5

10. In which years do residents have dedicated research time? Please indicate what percentage is

dedicated to research time per PGY level.

Percentage (0-100)

PGY2 \_\_\_\_\_

PGY3 \_\_\_\_\_

PGY4 \_\_\_\_\_

PGY5 \_\_\_\_\_

11. How much clinical time do research-oriented residents get by the time of their graduation?

- 2.25 clinical years (which is the ABD minimum)
- 2.5 clinical years
- 2.75 clinical years
- 3 clinical years
- More than 3 clinical years
- Other (please specify) \_\_\_\_\_

12. Does the resident on the research track have additional clinical rotations or on-call responsibilities compared to classmates?

- Yes
- No

13. You indicated that the resident on the research track has additional clinical rotations or on-call responsibilities compared to classmates. What are the additional responsibilities and what is the duration or frequency?

- Inpatient consults \_\_\_\_\_
- Weekend/night on-call \_\_\_\_\_
- Continuity clinic \_\_\_\_\_
- General dermatology clinic \_\_\_\_\_
- Specialty clinic \_\_\_\_\_
- Other \_\_\_\_\_

14. Which of the following is the resident expected to participate in during their dedicated research time?

Check all that apply.

- Grand Rounds
- Didactics
- Weekly clinic
- Other (please specify) \_\_\_\_\_

15. After which post-graduate year do the residents in the research track take their board examination?

- PGY4
- PGY5
- Other (please specify) \_\_\_\_\_

16. What funding is used to support the residents on the research track? Check all that apply.

- Department/ Division funds
- University

T32 grant  
Other (list all that apply) \_\_\_\_\_

17. Who oversees the progress of the research resident? Check all that apply.

- Program Director
- PI
- CCC
- Another committee
- Other (please specify) \_\_\_\_\_

18. Over the last 10 years, what percentage of your research track residents have remained at your institution as a principal investigator past 5 years of graduation?

\_\_\_\_\_

19. Please add any other comments or questions.

\_\_\_\_\_