

Factors Influencing Career Choice of Allergy and Immunology Fellows-in-Training: A Work Group Report of the AAAAI Program Directors Assembly Executive Committee



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What is already known about this topic? There is limited information on why and when Allergy and Immunology (AI) fellows made the career choice to pursue training in the field.

What does this article add to our knowledge? This article will add to the general knowledge on the factors surrounding the decision a learner makes to pursue training in the field of AI. It will also share key information related to the AI fellowship match, including trends in the ratio of the number of candidates per fellowship position.

How does this study impact current management guidelines? The results of the survey identified key factors in AI fellows' specialty career choice. This information could provide guidance on when in one's training and why the learner makes the choice to pursue a career in AI, which can be an important part of the strategy to recruit excellent candidates into our training programs and enhance diversity in our field.

BACKGROUND: As the burden of allergic and immunologic disease continues to increase, there is increased demand for a larger Allergy and Immunology (AI) subspecialty workforce. The field must prioritize the expansion of our workforce and the recruitment of exceptional and diverse trainees to ensure the vitality of the specialty. Although the AI fellowship match has

traditionally been competitive, recent trends in fellowship applications have demonstrated fewer applicants per fellowship position. This trend has made recruitment a priority on the agenda of the national AI societies.

OBJECTIVE: To elucidate key factors influencing the decision to choose the field of AI by querying fellows-in-training.

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Abbreviations used

AAAAI- American Academy of Allergy, Asthma, & Immunology
AI- Allergy and Immunology
URiM- underrepresented in medicine

METHODS: A survey was created and distributed yearly to fellows-in-training from 2017 to 2021 to identify factors influencing a career choice in AI.

RESULTS: Approximately 59% of respondents rotated with AI in residency and 35% in both medical school and residency. Most respondents reported having a mentor in the field before fellowship, and many had their first exposures to AI during medical school (40%) or residency (32%). Most respondents decided to pursue AI during residency. The most common factors that influenced the decision to pursue AI were work/life balance, clinical aspects of the field, mentorship, and research opportunities.

CONCLUSIONS: Our data suggest that the decision to pursue a career in AI often occurs during residency training and is motivated primarily by work/life balance, clinical aspects of the field, and clinician mentorship. Our survey results could provide guidance to AI training programs on strategies to recruit exceptional and diverse trainees. © 2024 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2024;12:627-32)

Key words: Medical education; Fellowship training programs

INTRODUCTION

Allergic diseases, including asthma, allergic rhinitis, food allergy, and atopic dermatitis, are common across all age groups in the United States and globally. Allergic or immunologic disorders currently affect an estimated 50 million Americans and are the sixth leading cause of chronic illness in the United States.^{1,2} Emerging biologic and small-molecule therapies are now readily available for allergic disorders such as moderate to severe atopic dermatitis, asthma, and eosinophilic gastrointestinal disorders. Adverse drug reactions are common, and allergy evaluation is now considered essential for antibiotic stewardship, for management of reactions to commonly used antibiotics, biologics, and chemotherapeutics, and for identification of perioperative medications causing life-threatening anaphylaxis. Although inborn errors of immunity are much less common than allergic disorders, awareness for these rare disorders is increasing. All babies in the United States are now screened at birth for significant T-cell disorders. Monogenic disorders causing inborn errors of immunity can present with increased susceptibility to infection, as well as autoimmunity, auto-inflammatory diseases, allergy, bone marrow failure, and/or malignancy and genetic testing is changing the way these patients are diagnosed and managed. For these (and many other) reasons, Allergy and Immunology (AI) specialists are essential members of the health care team. As the burden of allergic and immunologic disease continues to increase, the demand for a larger AI subspecialty workforce becomes more imperative. Accordingly, the field must prioritize not only the expansion of the workforce but also the recruitment of exceptional and diverse trainees to the specialty to ensure the vitality of our field.

Although the AI fellowship match has traditionally been competitive and overall the number of fellowship positions has increased, recent trends in fellowship applications to the field demonstrate a decrease in the number of applicants per fellowship position from 1.7 in 2008 to a nadir of 1.0 in 2018.^{3,4} Since 2018, the average applicant per AI fellowship position ratio has been 1.23, with the most recent 2023 match ratio of 1.3 candidates per fellowship position as shown in Figure 1.⁵ In comparison, fellowships that often have clinical overlap with AI had a range of 2023 match ratios including Adult Rheumatology at 1.4, Pediatric Rheumatology at 0.7, Adult Hematology/Oncology at 1.3, and Pediatric Hematology/Oncology at 0.9. In 2023, there were 199 applicants ranking at least 1 AI fellowship program in the Match. One hundred fifty-three of the 156 total available AI training program positions were filled.⁵ The trend toward fewer applicants has made this topic a priority on the agenda of the national AI societies. Previous studies have explored the timing of future career determinations by medical trainees. One study of pediatric residents who ultimately pursued fellowship training showed that most expressed general intent to pursue a fellowship early in their intern year.⁶ These residents typically did not waver thereafter and usually made their final selection of the specific subspecialty by the first month of their second year. This study underscores that subspecialty exposures in early residency could have a potentially profound impact on career choices, suggesting that efforts to attract strong trainees could be well invested in first-year residents. A different study of data gathered from focus group sessions of pediatric residents interested in pulmonary and current pulmonary fellows concluded that specific fellowship selection decisions most often occur early in the second year of residency.⁷ The same study found that mentorship is key and that trainees were attracted to the field due to the chance for variety in clinical practice (managing acute and chronic patients, seeing patients in clinic and inpatient) and the chance to apply respiratory physiology to clinical problems.⁷

Although recent data indicate that current allergists and immunologists have a high rate of career satisfaction,⁸ motivations underlying the decision to enter the field are yet to be evaluated. To attract outstanding candidates into AI, it is important to engage with young learners and identify factors that drive interest and, ultimately, commitment to a career in AI. These drivers have been investigated in other specialties. In a study of factors influencing Cardiology as a career choice, Internal Medicine trainees valued future work-life balance most highly, including stable hours, family friendliness, income, and career stimulation.⁹ In a similar study examining a cohort of Canadian medical students' motivations to choose careers in Primary Care, the main factors influencing career choice similarly centered on work-life balance as well as opportunities for more robust physician-patient relationships.¹⁰ We aimed to identify the factors influencing resident decisions to pursue a career in AI by querying fellows-in-training.

METHODS

In partnership with the American Academy of Allergy, Asthma, & Immunology (AAAAI) Program Directors Assembly Executive Committee, a survey was distributed to first-year AI trainees who began their fellowship between 2017 and 2021. Two classes of trainees were surveyed in 2020 (those who started fellowship in 2019

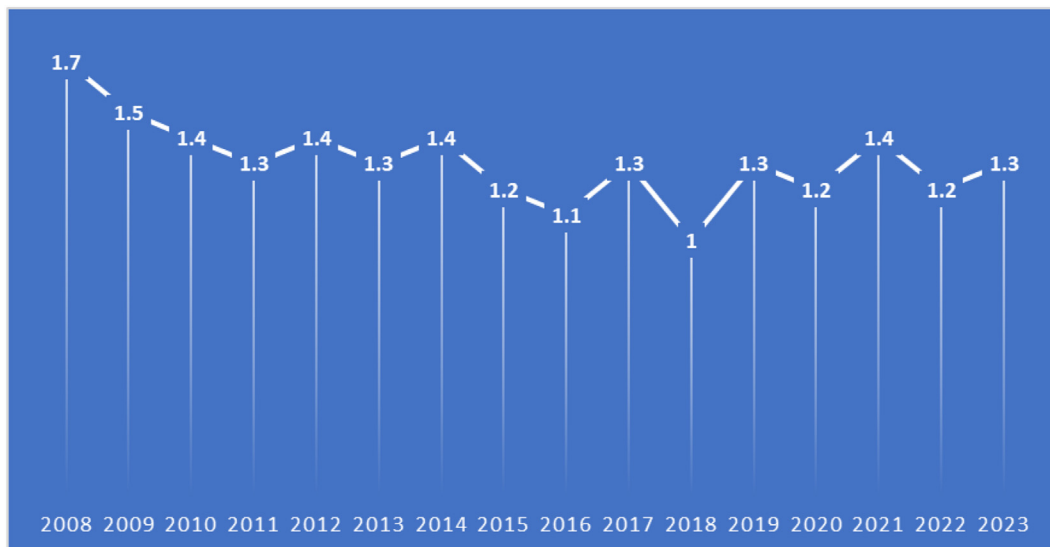


FIGURE 1. AI candidates per fellowship position data from the National Resident Matching Program. Results and data.⁵

and those who started in 2020) due to constraints from the COVID-19 pandemic. The surveys were sent securely via an email from the AAAAI to fellows at Accreditation Council of Graduate Medical Education—accredited AI training programs across the United States. There was no incentive for participation, and the data were deidentified so were not traceable to specific programs or respondents.

The survey consisted of 20 questions pertaining to demographic characteristics, training experience, and various factors related to AI exposure, mentorship opportunities, other fellowship or career paths considered, timing of decision to pursue a career in AI, and factors and motivations for choosing the field (see Figure E1 in this article’s Online Repository at www.jaci-inpractice.org).

RESULTS

A total of 321 responses were collected from AI fellows who began their training between 2017 and 2021. The overall response rate was 41%, with annual response rates ranging from 34% to 46%. Responses were lowest at the onset of the pandemic. Of the total survey responses collected, 67% of respondents identified as female and 70% were aged 30 to 35 years. Approximately 17% of respondents self-identified as a member of a racial or ethnic group historically underrepresented in medicine (URiM), defined in our survey as African American/Black, Hispanic/Latino, American Indian/Native, or Native Hawaiian/Pacific Islander. This percentage is higher than reported by the 2021-2022 Association of American Medical Colleges data, which indicated that 10.2% of AI fellows identify as URiM.¹¹ Of note, the Association of American Medical Colleges data on the percentage of AI fellows who self-identify as a URiM racial or ethnic group are similar to unpublished internal AAAAI survey data of the AI fellowship program directors and likely a closer approximation of the percentage of URiM trainees in AI fellowship training programs. Three-quarters of the respondents attended medical school in the United States. Regarding primary residency experience, 47% trained in Internal

TABLE I. Demographic characteristics of survey respondents

Demographic characteristics	N	%
Response total	321	41
Maximum possible respondents	784	
Age (y)		
25-29	60	19
30-35	225	70
35-40	31	10
>40	5	1
Sex		
Female	214	67
Male	107	33
URiM		
Yes	54	17
No	266	83
No response	1	0
Graduated from a US medical school		
Yes	244	76
Primary residency		
Internal medicine/Pediatrics	26	8
Internal medicine	151	47
Pediatrics	144	45

Medicine, 45% Pediatrics, and 8% Internal Medicine/Pediatrics (Table I).

Fifty-nine percent of respondents participated in AI rotations in residency versus 35% in both medical school and residency and less than 1% in medical school alone. Only 3% of respondents had not participated in an AI rotation before fellowship. Around one-third of respondents (37%) reported that there was an AI division within their medical school and residency institutions, and an AI fellowship program at the site of their residency training. A significant proportion of the respondents (76%) reported that their residency institution had an AI

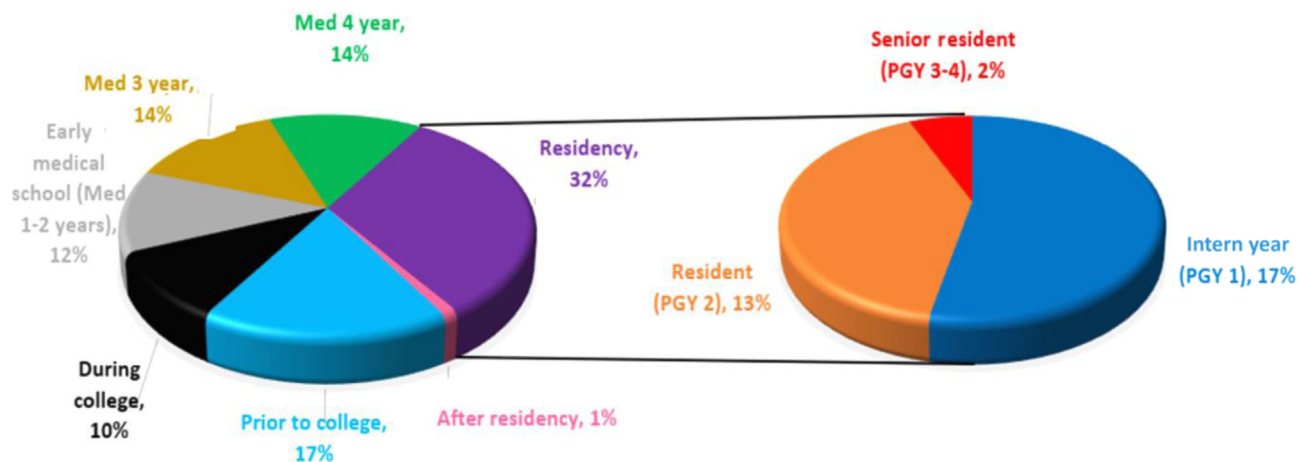


FIGURE 2. AI fellows first exposure to the field of AI.

division. In contrast, 15% had neither an AI division affiliated with their medical school nor an AI division or fellowship at their residency program. In considering the respondents who identify as URiM, these trends were similar, with 67% reporting AI divisions within their residency institutions and 13% reporting no institutional AI presence in their training.

The Chrysalis Project is an AAAAI program that supports medical students and residents attending the annual meeting to allow for career exploration. Approximately 20% of those who responded to the survey participated in the Chrysalis Project and 53% attended either an AAAAI or American College of Allergy, Asthma, and Immunology meeting before fellowship. First exposure to the field for most respondents was in medical school (40%) and residency (32%), but 17% reported first exposure before starting college (Figure 2). Most respondents (73%) decided to pursue AI at some point in residency, with 55% of those who decided during residency doing so in their second year (Figure 3).

Multiple factors were identified that influenced fellow in training's decision to pursue AI, but the most important was work-life balance, which 79% of respondents identified as one of the most significant factors to career choice. In addition, 75% of respondents identified clinical aspects of the field as important (Figure 4).

Mentorship in the field was also influential, with 29% of respondents citing it as influencing career choice and 76% of respondents reporting having a mentor in the field before fellowship. Of these mentors, 67% were in academics and 15% in private practice. Research opportunities in the field (25%) and income potential (24%) were also identified by respondents as important for career choice. Rheumatology and Hematology/Oncology were the most common alternative fellowships considered; however, most respondents did not consider other fellowships besides AI.

DISCUSSION

As the diagnosis of and treatment options for allergic and immunologic disease continue to increase, it is essential that we grow the AI subspecialty workforce. Factors such as population growth and an expanding aging American population further

underscore the necessity to successfully encourage more physicians-in-training to pursue a fellowship in AI.¹² There is a need to ensure that young learners are aware that AI offers many exciting and fulfilling opportunities for future physicians interested in managing various allergic and immunologic diseases in patients of all ages. The field also offers a wide range of career paths within academics, clinical practice, research, and industry. To our knowledge, this study is the first to examine motivations and factors influencing the career choice of AI fellows-in-training. Gauging when and why young learners make their career choice could allow for increased efforts to engage with students and residents. Innovative programs such as the AAAAI Chrysalis Project and Clinical Rotation Curriculum and the American College of Allergy, Asthma, and Immunology SPARK Award program allow students to learn about the incredible depth and breadth of our clinical practices and research opportunities. Using the data from this survey could allow for other targeted engagement.

Although our results are somewhat limited in generalizability due to response rate, the data suggest that the decision to pursue AI is motivated primarily by work-life balance, clinical aspects of the field, mentorship, and research opportunities. These factors were in line with those demonstrated in similar survey studies in other fields.^{9,10} One additional influence that was not considered in our study was overall perceptions of the field before fellowship. Understanding how learners perceive the field of AI could assist in selecting focus areas for early exposure to reinforce correct perceptions and rectify inaccurate ones. A recent survey study of medical residents showed that in an unselected sample from the American Medical Student Association, 94% of respondents had heard of AI, but only 19% had interacted with allergy at their program. These respondents did not have a declared interest in AI and reported that AI didactics and electives would be valuable to increase interest.¹³ These findings suggest that increasing both clinical and nonclinical AI exposure to residents and medical students is likely to increase interest in the field and fellowship.

Unlike other subspecialties commonly encountered in early learners' training, many medical students and residents are not exposed to the field of AI early in their schooling and primary residency training program. These early learners spend the bulk of their clinical time in the inpatient setting, often limiting access

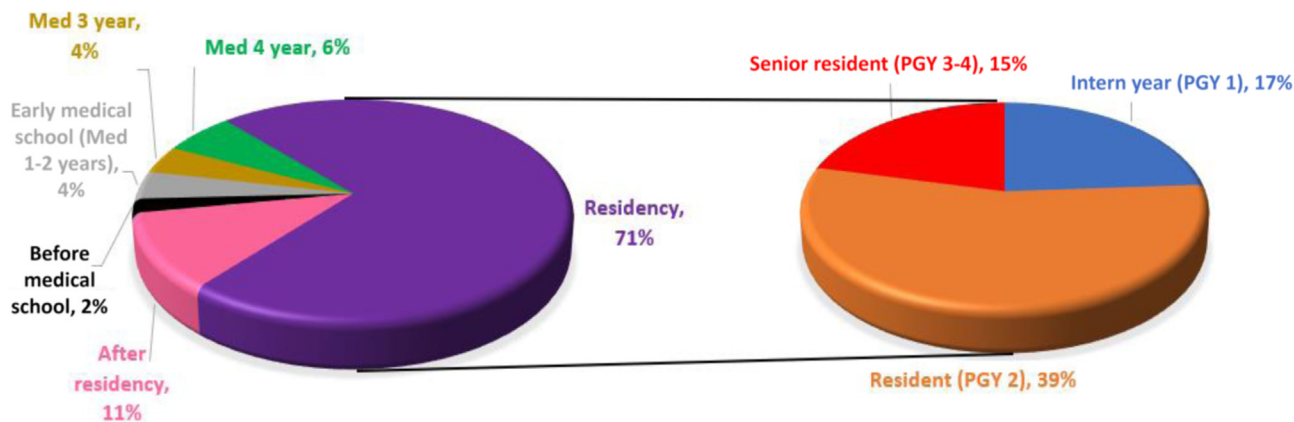


FIGURE 3. AI fellows timing of decision to pursue a career in AI.

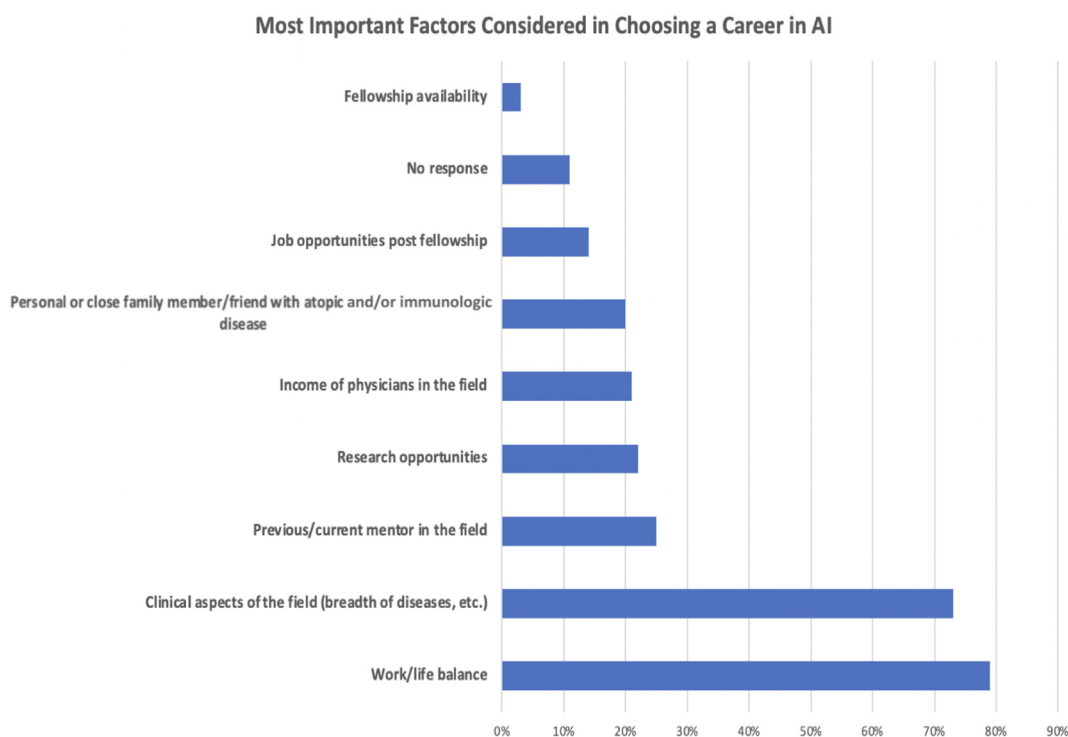


FIGURE 4. Factors that influenced AI fellows when choosing a career in AI.

to most AI rotations.³ It is not unusual for residents and medical students to lack exposure to the field. The fact that most respondents who ultimately chose AI tended to have mentorship in the specialty and decided to pursue AI during residency highlights the opportunity that the field has for effective recruitment even later in training. With that in mind, efforts to grow interest in the field of AI must be more creative and intentional, especially at those programs and medical schools without AI services. It is imperative that allergists and immunologists all do their part to introduce AI as a specialty to the medical students and residents they encounter.

A critical factor that was not adequately captured in our survey was diversity within the field. Our survey collected information on the number of respondents who identified as URiM but did

not expound upon this topic. This survey identified a higher percentage who self-identified as URiM than the AI fellow-in-training population, so it is possible that URiM fellows responded at a higher frequency than non-URiM fellows. This would suggest that they are well represented in these survey results. Promoting inclusion, recruitment, and retention of diverse trainees and faculty is vital to the progress of medicine, including the AI specialty. Health disparity outcomes in underrepresented racial and ethnic minorities unfortunately manifest commonly in allergic and immunologic disease, especially regarding asthma.^{14,15} Data from the past 2 decades suggest that health inequities in AI are not improving,¹⁴ a reality only accentuated by the COVID-19 pandemic.¹⁶ One way to address this key factor in patient care is to expand AI physician workforce

diversity, especially as URiM physicians have been shown to have a higher probability of working in medically underserved and health professional shortage areas.¹⁷

AI is a dynamic and rewarding field that offers substantial benefits to those who choose to pursue a career in the specialty. This study elucidated that most AI applicants chose the field in residency and that mentorship was an important factor in that decision. Future studies and efforts should also examine perceptions and misperceptions of our specialty and promote inclusion in our field, especially directed toward URiM trainees. Intervention opportunities that increase AI visibility in medical school and early residency settings and support mentorship from private practice and academics may be the most impactful first steps to ensuring the vitality of our field.

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ONLINE REPOSITORY

1) What is your gender?

- Male
- Female
- Prefer not to respond

2) Do you self-identify as a member of a racial or ethnic group historically underrepresented in medicine (URiM), African-American/Black, Hispanic/Latino, American Indian/Alaska Native or Native Hawaiian/Pacific Islander?

- Yes
- No

3) What is your current age?

- 25-29
- 30-35
- 35-40
- >40

4) Did you attend medical school in the United States?

- Yes
- No

5) Did you have the opportunity to participate in an Allergy and Immunology rotation before starting fellowship? If yes, please select all that apply.

- Medical school
- Residency
- Other Please specify: _____
- AAAAI clinical rotation curriculum

- No, I did not have the opportunity

FIGURE E1. Allergy and Immunology Fellow Survey.

6) In which field did you complete your primary residency?

- Internal medicine
- Pediatrics
- Internal medicine/Pediatrics
- Other Please specify: _____

7) Did the clinical site(s) at your Medical School have an Allergy and Immunology Division/Section?

- Yes
- No
- Don't know

8) Did your residency program (department) have an Allergy and Immunology Division/Section?

- Yes
- No
- Don't know

9) Did your residency program (department) have an Allergy and Immunology Fellowship Program?

- Yes
- No
- Don't know

10) When did you first learn about the field of Allergy and Immunology?

- As a child (before college age)
- During college
- Early medical school (Med 1-2 years)
- Med 3 year
- Med 4 year
- Intern Year (PGY 1)
- Resident (PGY 2)
- Senior Resident (PGY 3-4)
- After residency

FIGURE E1. (CONTINUED).

11) When did you first consider a career in Allergy and Immunology?

- Before medical school
- Early medical school (Med 1 - 2 years)
- Med 3 year
- Med 4 year
- Intern Year (PGY 1)
- Resident (PGY 2)
- Senior Resident (PGY 3-4)
- After residency

12) When did you decide to pursue a career in Allergy and Immunology?

- Before Medical School
- Early Medical School (Med 1 - 2 years)
- Med 3 year
- Med 4 year
- Intern Year (PGY 1)
- Resident (PGY 2)
- Senior Resident (PGY 3-4)
- After residency

13) Did you have a mentor in Allergy and Immunology before starting fellowship?

- Yes (go to Q14)
- No (go to Q15)

14) What was your Allergy and Immunology mentor's career in the field?

- Basic scientist (works exclusively in the lab)
- Physician scientist
- Private practice allergist
- Clinician in academic setting
- Position in industry

15) What other fellowship programs did you consider?

- Pulmonology
- Hematology/Oncology
- Rheumatology
- Infectious Diseases
- Other Please specify: _____
- I didn't consider any other fellowship programs

FIGURE E1. (CONTINUED).

16) Prior to fellowship, did you have the opportunity to attend either the American Academy of Allergy, Asthma, & Immunology (AAAAI) or American College of Allergy, Asthma and Immunology meetings (ACAAI)?

- Yes
- No

17) Have you been a participant in the AAAAI Chrysalis Program?

- Yes (go to Q18)
- No (go to Q19)

18) During what part of your career were you a Chrysalis Project travel grant recipient?

- Early Medical School (Med 1 and 2 years)
- Late Medical School (Med 3 and 4 years)
- Intern Year (PGY 1)
- Resident (PGY 2-4)
- Applied for the travel grant but was not selected

19) What were the most important factors to you as you considered a career in Allergy and Immunology (select up to 3 responses)?

- Research opportunities
- Clinical aspects of the field (breadth of diseases, etc.)
- Work/life balance
- Income of physicians in the field
- Previous/current mentor in the field
- Personal or close family member/friend with atopic and or immunologic disease
- Job opportunities post fellowship
- Fellowship availability

20) Please share any other information you feel could be helpful on your decision to apply to Allergy and Immunology fellowships.

Thank you for your input.

FIGURE E1. (CONTINUED).