Interprofessional Cancer Research Training – Marriott et al.

Appendix D. External Evaluation of High School Trainees Participating in a Cancer Research Training Program.

Focus Group Scripts: Introduction

Table D1. Post-program focus group scripts evaluating high school trainees participating in a one-week cancer research training program

2019 Introduction Focus Group Script (In-person program)	2021 Introduction Focus Group Script (Virtual program)

• Icebreaker activity while getting settled: For each notecard, respond to these two prompts. No names please!
  ○ Color 1: What was your favorite thing you learned this week? (green card)
  ○ Color 2: How do you plan to use the information you learned this week in your life? (white card)
• About the program
  ○ What parts of the program did you like the most? Probes = meeting particular people, learning about new career options, learning about cancer research
  ○ How did you feel about the different backgrounds and perspectives that were represented by the people you met?
  ○ What backgrounds and perspectives did you feel were not represented well?
  ○ What advice would you give to make the Introduction program better next year?
  ○ What parts of the program would you like to change?
  ○ What would you like to add to the program?
  ○ Fist to Five: Are you interested in coming back for the Immersion program next year?
  ○ Fist to Five: Would you recommend this program to a friend? Probe why, if needed
• About STEM pursuits
  ○ What is unique about this opportunity compared to other STEM-focused activities available to you and your peers? Can you provide examples?
  ○ What different types of research did you learn about this week?
  ○ How did this program change your understanding of research?
  ○ How did this program change your attitudes about research? Probes: Biomedical research, Cancer research
  ○ How did this program change your attitudes about pursuing a career in research?
  ○ What different types of careers did you learn about? Probes: Biomedical research, Cancer research
  ○ Did this program change your educational goals?
  ○ What are your biggest concerns about pursuing a career in science research?
  ○ What advice would you give a friend who wants to pursue a career in science research?
	• Anonymous icebreaker activity using Google Jamboard
	  ○ What was your favorite thing you learned this week?
	  ○ How do you plan to use the information you learned this week in your life?
	• About the program
	  ○ What parts of the program did you like the most? Probes: meeting particular people, learning about new career options, learning about cancer research
	  ○ How did you feel about the different backgrounds and perspectives that were represented by the people you met?
	  ○ What backgrounds and perspectives did you feel were not represented well?
	  ○ What advice would you give to make the Introduction program better next year?
	  ○ Jamboard Fist to Five: Are you interested in coming back for the Intensive program next year? Probe: why?
	  ○ Jamboard Fist to Five: How likely are you to recommend this program to a friend? Probe: why?
	About STEM pursuits
	  ○ What is unique about this opportunity compared to other STEM-focused activities available to you and your peers? Can you provide examples?
	  ○ What different types of research did you learn about this week?
	  ○ How did this program change your understanding of research?
	  ○ How did this program change your attitudes about research? Probes: Biomedical research, Cancer research
	  ○ How did this program change your attitudes about pursuing a career in research?
	  ○ What different types of careers did you learn about? Probes: Biomedical research, Cancer research
	  ○ Did this program change your educational goals?
	  ○ What are your biggest concerns about pursuing a career in science research?
	  ○ What advice would you give a friend who wants to pursue a career in science research?
	Virtual Participation
	  ○ The program became virtual due to COVID-19. How did the program being virtual influence your participation or engagement with the program? Probe: What issues did you experience with the virtual nature of the program?

Introduction Focus Group Results

Six focus groups were held, three in each cohort that included a facilitator and a note taker. Themes were developed by the OHSU Evaluation Core's faculty and staff who served as external evaluators of the project. Focus groups were coded to denote which cohort (e.g., C1, C2) and which focus group they represented (e.g., 1-3): EW=C1F1; AZ=C1F2; KG=C1F3; AD=C2F1; CR=C2F2; AW=C2F3.

Results are presented in script order, with themes summarized in tables:

- Favorite thing learned
- Plan to use information learned in their life
- Program components trainees liked most
- Representation
- Recommendations for improving the Introduction program
- Intention to return for Immersion training
- Likelihood of recommending Knight Scholars Program to a friend
- Uniqueness of this opportunity compared to other STEM-focused activities
- Impact of program on trainees' attitudes/understanding about research
- Impact of program on trainee's attitudes about pursuing a career in research
- Trainees' biggest concerns about pursuing a career in science research
- Advice for future students who want to pursue a career in science research
- Impact of virtual training on Introduction scholars (cohort 2 only)

Favorite thing learned in Introduction program

Table D2. Favorite thing learned during the week

What was your favorite thing you learned this week? (Written responses and notes with estimate count when given)		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Learning about researchers' career trajectories and challenges they faced in getting to where they are today	● Scientists who discussed struggles "gave me hope that someone who has flaws and was never considered "the best" made such a revolutionary change" (C1F2) ● "It was fascinating to find out that you don't have to be in the best class with all A's and being rejected isn't the end." (C1F3)	● "Literally all of the people that we talked to, they got to where they are, like, not on a linear path. It's been a struggle and a really windy road with turns and changes." ● "Everyone's path is bound to change, so just follow your heart" ● Five scholars reported this theme in cohort 2
The variety of career options in cancer research	● "There are many jobs in cancer research" (C1F2) ● Radiation; robot-assisted surgery (C1F3) ● New technology and machinery (C1F1)	● "I loved the exposure of all the different careers in the field of cancer research it makes me want to pursue a career in research" ● "There are so many different careers that are related to fighting cancer" ● Nine scholars reported this major theme in cohort 2
Specific topics that were covered by presenters	● Housing of cancer patients (n=2); clinical trials, disparities in communities and how to address them (C1F3), treatable cancers, cancer drugs, biostatistics, radiation oncology (n=2), pancreatic cancer, fluorescence ● "I definitely learned about what cancer is, treatment, cures, and how much it takes for a cancer institute to run." (C1F2)	● Clinical trials (+5), fluorescence, clinical care, radiology, genetic counseling, child life specialist, science behind cancer, chemistry and biomedicine
Motivation for the future	Not described outside the context of learning about struggles from researchers gave them hope about accessibility of the field.	● "Don't let your failures set you back" ● "That mentorship is KEY and that my differences will become my strengths"

Plan to use information learned in the Introduction program in trainees' life

Table D3. Scholars' plan for using the information they learned during the week in their life

How do you plan to use the information you learned this week in your life?		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Education and career path: general	• "I learned that a lot of the people we talked to didn't go to […] big colleges to be successful. I'll apply this by trying to go to a college I want and master in the field that's most interesting and that can change." (C1F3) • "I want to take the knowledge I have now and share it with other peers. They didn't get the opportunity to be a part of this program, so they don't have the knowledge I have now." (C1F1)	• "I plan to apply to colleges with the intent that I can, and will become whoever I want to be - with the knowledge of all the future possibilities/ careers." • "I plan to use it by helping me decide what path I want to take in life" • "I plan on using this information to find what I'm truly committed and passionate in. The other discussions will also motivate me in other areas in my life"
Education and career path: science/research	• Helping others was a major theme; including interest in social work applications of cancer, including counseling and health services accessibility. • Cancer and treatment awareness (n=4): ""I plan on spreading cancer awareness and info around my rural community so people understand it better and are aware of the treatment." (C1F2; C1F3) • "If I ever meet anyone with cancer again and they'd like to know more about it I'll help them understand more about it. Also probably go into a career to help kids with cancer I'd take the information for my future career." (C1F3) • "I will apply it by looking more into cancer disparities and supporting people w cancer in my personal life" (C1F2) • "This topic really interest me and I'm now thinking about pursuing a career in this field." (C1F2)	• "The information I learned definitely stimulated my interests in cancer research and careers, but it also taught me that career paths aren't linear and to just go with the flow." • "I want to help my community in regards to cancer." • "With my journey through education, especially with my plan to go into a biomedical field."
Education and career path: not science/research	• "I now know that personally, I'm not interested in this field of work except for the Ronald McDonald house. It brought me one step closer to deciding/knowing what I want to do in life and it won't be this." (C1F3)	• "The information I learned this week has helped me to determine that I don't want to go down the pre-med path just yet and the invaluable advice I've received will help me to network and build relationships with others"
Other	"I have no clue at all."	• "I'm more inspired to create good networking with mentors, as well as what field to study in. It also inspired me to balance school with relaxation" • "Be open to learning new things and make connections"

Introduction program components trainees liked most

Table D4. Program components that trainees liked most in Introduction program

What parts of the program did you like the most? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Meeting researchers and professionals	● "I liked going to the lab and seeing what they were actually doing, like when I hear about a scientist I used to think like oh those don't really exist, but going into labs and actually seeing them work was cool." (C1F2) ● "I liked hearing about their story, their careers, and their roles." (C1F3) ● Emphasize struggles in personal stories "cause then we could get a feel for what they were like and we could like relate to them" (C1F2). Makes scientist more human. Focusing on good grades in school wasn't as well-received	● Seeing how much speakers opened up to us; they have the same struggles and seeing what they got to do with their life (C2F2) ● I liked learning about their personal life, it made the room feel less awkward. A lot of people thought scientists were strict, they aren't as scary as they thought they were. (C2F1) ● I liked how the speakers talked so honestly, it wasn't just a pep-talk to go into science/medicine, it was actual perspectives (C2F1)
Meeting other scholars/peer mentors	● Peer mentors were "super nice, funny, easy to relate to" (C1F1) ● The other kids in the program, got closer this week—talked and bonded. (C1F1)	● Talking with our mentors was pretty warming. It was almost like talking to another student, they were very open and interested in the program. It was like they were another student; they would ask questions and they'd answer open heartedly and give us honest answers and good advice. (C2F1) ● I live in a super small town so it's hard to find people with same interests so this allowed her to find other people around the same age that are interested in the same thing; and hearing that other people struggle with the same things that I do (C2F2)
Exposure to STEM areas/careers	● "I liked learning about things kind of like I envision in the future. Like yesterday, they showed us the robot assisted surgery." (C1F3) ● "I knew there were middle men in between everything, not just doctors and scientists, but I didn't imagine there were so many fields in-between"	● It was so interesting learning from them and simplifying things; [One scientist] really pulled me talking about chemistry, it's something I haven't seen before. (C2F1) ● Appreciated learning about the science behind cancer and cancer research (C2F2)
Tours and facilities	● "I liked the tours because it showed me what you do - the labs" ● "Getting to stay in the dorms and connecting with my peers" (C1F1) ● "Being in a different environment	Not present due to virtual setting

Representation of Introduction Program

Table D5. Representation of backgrounds and perspectives in the Knight Scholars Program

How did you feel about the different backgrounds and perspectives that were represented by the people you met? What backgrounds and perspectives did you feel were not represented well? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Good diversity of backgrounds and perspectives	● "I personally liked that it was pretty diverse, like all the speakers we saw. I'm glad I got to see different perspectives like genders, races, ethnicities, nationalities. I thought that was really nice to see." (C1F2)	● The emphasis on diversity was so cool in this program, I don't get the chance to see much POC, and I didn't know how much diversity there is in medicine/science today. (C2F1) ● it was nice knowing that there are people who didn't come from a well family and how they still made it to do something they love (C2F1)
Saw themselves represented	● "I felt like a lot of speakers were very similar. All were from a different area, had struggles growing up. Able to relate to them a little bit." (C1F1)	● Very diverse, whether it was gender, or culture, and economically, "I got to speak with a Native woman who came from a similar background like mine, not being able to afford college and first generation to go to college; it helped a lot of us who are in similar situations" (C2F1) ● Comforting to hear from people different backgrounds and empowering as a woman of color (C2F2)
Missing or underrepresentation	● "Misrepresentation or underrepresentation of African-Americans" (citing Black scientists from Haiti, Jamaica). "Immigrants have more success than African-Americans born in America." (C1F1) ● Newspaper story on the program emphasized rural aspects of the program, which underrepresented urban students	● Muslim: I was hoping to see people from Muslim backgrounds. (C2F1) ● LGBTQ+: LGBTQ weren't as represented (that we knew of) but surprised by how diverse it was (C2F2) ● Disabilities: People with disabilities missing (C2F3) ● Low Resource, non-urban: I wish there was more advice for communities with little resources; Majority were from Portland area (C2F1)

Recommendations for improving Introduction program

Table D6. Advice for improving the Introduction program in the future

What advice would you give to make the Introduction program better next year? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
More instructions/guidance	● Limiting slides "When they have a lot of slides they go faster and it was harder for me to take notes." (C1F1). ● Have presenters summarize key points for learning and provide presentation materials in advance. Other options include showing a key picture of what they're doing.	● Including a cheat of terms to keep in mind or listen to, there's a lot of words that we don't know and aren't familiar with. There is a gap in knowledge that doesn't allow us to understand what they are talking about. (C2F1) ● It would be helpful to let us know when to take notes at the first session/tips for sessions. (C2F1)
Program Structure	● Preference for hands-on things (C1F1) and less 'talking at students' (C1F3). Make interactive (C1F2), though scholars acknowledged they "couldn't work in the lab because not 16 yet" ● Separating into sub-groups can result in inequity of experience; finding ways for self-selection into groups by interest is recommended. (C1F1) ● "More work focusing on disparities… they should focus on it with a program for underrepresented students" (C1F2)	More Breakout Room Structure ● Breakout rooms self-monitored so hard to navigate and sometimes there were two people in a room and sometimes 15 in another- recommend more balance (C2F3) ● During portions of different people, a little bit more structured, many had to re-introduce themselves, if there was more of an order of how they were presenting (C2F1)
More time (for questions and with great people)	● Scholars wanted more time with people who had interesting, hands-on things to show them (C1F2) ● Scholars want more autonomy in how they spend time with presenters, who tend to talk 'at' students.	More time for questions ● Timing of the breakout rooms could have been better- didn't always get to ask the questions they wanted – more structure for those (C2F3) ● End of session there would be numerous questions that weren't answered so more time for that at the end (C2F2)
Group Bonding More informal time to get to know each other (remote nature made this more challenging than if it had been in person)	● "More things as a whole group instead of splitting up and doing different things." (C1F1) ● Eating food together was described in context of community and comparing regional food preferences. ● More icebreakers and getting to know each other. ● "I actually liked having a roommate of someone I don't know" (C1F2) ● Fun, informal time together (C1F2)	● First day was the only time they got to talk to each other (that would be easier in person but wanted more time to collaborate with other scholars) (C2F3) ● More icebreakers- icebreakers were more in groups but it would be good to move around and meet different people; able to go into small groups and do a set activity together; sending people to rooms and asking them to talk about things is really hard to get conversations started; hard to engage through the chat; get to know each other and have meaningful small conversation (C2F2)
More opportunity to individualize program	● Independence was requested; minors were instructed to travel in triplicate if leaving area (C1F1) ● Clothing (shirts, scrubs, coat) "make it feel official" (C1F2) ● Integrate activities after content	● More opportunity to choose what topics to learn about and focus specifically on interest (C2F2) ● Less than an hour on each presenter and a lot of sitting there and we'd have to sit there for things that weren't as interested in (C2F2)

Intention to return for Immersion training

Table D7. Interest in returning for ongoing training in Immersion program

Are you interested in coming back for the Immersion program next year? Describes specific quotes or field notes describing themes. Fist to five counts summed.		
Theme	**Cohort 1 (In-Person Program)**	**Cohort 2 (Virtual Program)**
Overall rating counts	Total: (n=25); 5 (n=18*); 4 (n=4); 3 (n=2); 2 (n=1) C1F1: 5 (n=4); 4 (n=3); 3 (n=1) C1F2: 5 (n=rest; estimated 8*); 4 (n=1); 3 (n=1) C1F3: 5 (n=6); 2 (n=2)	5 (n=21), 4 (n=9), 3 (n=3)
What students are looking forward to	● "Lab work - I want to see it in action" (C1F3) ● Opportunities in hospitals, labs, and communities (C1F3), ● Deepening knowledge and presenting findings even if uncomfortable (C1F2): " I'm excited to extend my knowledge to deeper parts, like not just this is how it is but this is WHY this is everything. Even though I hate presenting, it will kind of expand my comfort zone" ● "Getting people into to the program is going to give them more exposure to things like this so they can become doctors and scientists like we see, actually doing the research in communities" (C1F2)	● There are a lot of opportunities that are hard to find, so it's very exciting. You don't know how to find opportunities to shadow. To be in a lab, I've never seen a cancer research program; this is definitely something that's not as covered as other positions in the medical field. It's different than everything else. (C2F1)
Concerns	● "This is an introduction but we mostly sat down. However, I'm ready to dive in and want to be hands on." (C1F3) ● "It's a lot of commitment for 3 months and I want to make sure I'm doing something I care about" (C1F2) ● Representation of science: the people scholars see every day should represent them. Programs should be mindful about how and why they are recruiting student populations to limit perceptions of tokenism; also needed for building trust among students so they can envision themselves in these fields (C1F2)	● Very interested in shadowing but it would mean sacrifices at home (C2F3) ● Planning travel and weighing options (C2F3) ● Roommate (can't remember interview)

Likelihood of recommending Knight Scholars Program to a friend

Table D8. Likelihood of recommending the Knight Scholars Program to a friend

How likely are you to recommend this program to a friend? Describes specific quotes or field notes describing themes. Fist to five counts summed.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Overall rating counts	Total: (n=25); 5 (n=16); 4 (n=7); 3 (n=); 2 (n=2) C1F1: 5 (n=5); 4 (n=2); 3 (n=1) C1F2: 5 (n="all", estimated 10) C1F3: 5 (n=1); 4 (n=5); 2 (n=2)	5 (n=24), 4 (n=5)
Unique opportunity	● "It really kind helps you discover new things" (C1F2) ● "Not just the information which has been amazing, it's just been interesting to see how everyone else lives and relate to people here" (C1F2) ● "There's nothing like this, anything at all, so it's super cool." (C1F2)	● There's a lot of information that is not available elsewhere. It's a good introduction to what this field looks like, its only a week, so you don't have to commit too much, it's not everyone's forte so it's cool to look at (C2F1) ● Go to school with few opportunities so it would be awesome for people from their school (C2F3)
Paid	● Not described in Cohort 1 focus groups in the context of recommending a friend.	● Paid internships are hard to come by (C2F2) ● Get paid for your time, it's a paid learning opportunity, which is good. There is a lot of people that don't know you can get paid to learn in a program. (C2F1)
General	● "I would recommend it to my friends because we live in central Oregon in an area where it's not heavily populated and coming to the city it's been kind of a culture shock so it's interesting to see how different lives are even as a social standpoint." (C1F2)	● Really good experience and would recommend to any underclassmen or people interested in medical field because its different (C2F3) ● Lots of fun and meet people from different backgrounds (C2F2)

Uniqueness of this opportunity compared to other STEM-focused activities

Table D9. Uniqueness of the Knight Scholars Program opportunity compared to other STEM-focused activities available

What is unique about this opportunity compared to other STEM-focused activities available to you and your peers? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Beyond math & science	• Oncology-focused (C1F3) • Exposure to research that happens beyond laboratories (e.g., community research) (C1F3) • Marketing research (how cancer drugs are made and sold; C1F3)	• Those usually have to do with math or engineering, trying to make STEM look fun; you find a lot of the same things. This is very specific and focused on medical and cancer research. It's super unique. I have never come across such a specific career like this (C2F1)
Few other opportunities	• "It's a 3-year program so you can get deeper into it. The first one is like this is kind what we are offering here, are you interested in going deeper into the subject, are you truly invested? And then when you get deeper into it you start to understand more and more about the health field. I don't think there's another program that can get you as deep since they aren't as hands on and they don't last that long and they're not in different environments. Maybe you go home or maybe it's just in this one area but since this one is all across Oregon we're getting different opinions." (C1F2) • Paid opportunity supports equity in participation, particularly for low-income students (C1F2)	• The fact that it was available, I come from a very small school (160 students) and it was such a rare opportunity offered to my community. (C2F1) • Wouldn't have the experience to meet folks from OHSU which wouldn't be possible at my school (C2F3)
Hands-on nature	• "Science in general is more interesting when you get to talk with people who are [doing science]." (C1F1)	• Hands on to see it for yourself and see if it's a career path that you want to pursue; get to see it not just hear about it (C2F3)
More inclusive	• Meeting different people of different backgrounds (C1F3)	• Previous programs were women in STEM-focused and this was more inclusive and broader range; other program was a lot smaller (C2F2) • You didn't need to know much about cancer in order to be in this program and accepted questions and it was really inclusive (C2F2)

Impact of Introduction program on trainees' attitudes or understanding about research

Table D10. How the Knight Scholars Program (Introduction tier) changed trainees' attitudes/understanding about research

How did this program change your attitudes/understanding about research? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Beyond patient care	● "I learned that there was way more opportunities or pathways you could choose, learning about new systems like precision oncology and treatment for just one patient." (C1F1) ● Fields like precision oncology, radiology, and personalized medicine with clinical trials (C1F3). ● "I thought doctors and research were separate. I thought you either do one or the other, not both. Doing this showed us good doctors do research to improve themselves." (C1F2)	● One of the reasons I have been turned off by the medical field, I didn't want to work with patients, but now learning about the different fields of research, it makes me want to pursue a career in the medical field (C2F1)
Beyond bench science	● "I did not know there were so many different types of research, and so many different aspects and components to it" (C1F2) ● Different types of research, like clinical trials, biostatistics, lab work ● Amount of work needed to develop and test new medications (C1F2)	● When I first thought of research, I thought of lab coats and in a lab and thought it wasn't for me and learned that it was lots of other things and so many different things and so many different aspects to it that I never thought of (C2F2)
Personable nature of research	● Interesting nature of research as a motivation for continuing (C1F2) ● "when you actually love your job the hard work gets easy and I feel like that's true" (C1F2) ● Many describe prior perceptions of research being boring changed by their experience.	● We saw it's not just strict and science-y, they have good workspaces and happy environments. Even working around cancer, I thought it was going to be sad, but once the scientists had the experience, they showed us it's not like that. In research, once you simplify what you're doing, it's not that bad, you're just doing it. (C2F1) ● There's a lot of collaboration going on. You can work independently or in a group setting. A lot of their perception about work/life balance, that's not necessarily the case. They have a balance. In reality, their profession isn't their life. (C2F1)
Collaborative nature of research	● Drug discovery process and clinical trials (C1F2) ● Fixing problems using research processes (C1F2) ● "Cancer is a really big thing that you can really get into" (C1F3) ●	● Thought being a research didn't involve much being with people but learned that you can get to work with people (C2F3) ● Knew they were doing experiments but didn't really know how long or how many people were needed to be able to conduct experiments (C2F3)

Impact of Introduction on trainees' attitudes about pursuing a career in research

Table D11. Program impact on changing trainee attitudes about pursuing a career in research

How did this program change your attitudes about pursuing a career in research? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Sparked interest in research	● Research can be accessible ("you don't have to be a 4.0") (C1F3) "It's more possible—not as hard and daunting a path as I thought it was." (C1F1) ● "You can combine what you love and what you're really good at" (C1F2) ● Before I came to this program, I never saw myself in the health field or anything cancer related, but now I feel like I've had exposure to it and I'm grateful for the opportunity. And it opened my eyes to how great everything is in this field and industry. I think seeing people that look like me helped. I thought doctors and scientists weren't anyone I relate to, so seeing them like me made me feel like maybe I can do this and like I can really help." (C1F2) ● "I wasn't really sure about how I would feel about this program but now I am interested in everything. There is a lot to learn and do, sparked an interest in everything." (C1F1)	● Was confused about career path- knew I wanted to do something in the medical field- this week showed me other fields that are cell research it sparked my interest- can still help with cancer research without dealing with blood (C2F3) ● Inspired me more because it was fun to see how the doctors and scientists talked about their work. They really loved it. (C2F1) ● It made me interested because I'm also not a science person but I kept an open mind about it and I actually learned a lot more than I thought and it's actually a lot more interesting to me personally because there a so many different careers (C2F1)
Deepened interest in research	● Team-science approach "There could be 3 scientists working on pancreatic cancer and they're each trying a different way" (C1F2) ● Honed interests and helped to clarify potential paths (e.g., "community work in a hospital"; "I would never do the microscopy stuff. I could never do that. However, I would like to do the labs." (C1F3) ● Interest in innovating in research by trying something new (C1F2)	● Deepened my interest in research; new perspective on what I might want to do (C2F2) ● I'm more inclined to go into the medical field, but I am still unsure of what career path I am pursuing. I want to continue to see if this is what I'd like to do for a lifelong job. (C2F1) ● It made it an option because of how interesting the research aspect of it is (C2F1)
Education impact	● Scholars reported wanting to "take better classes", including "more research classes" (C1F3) ● Degree paths like masters, PhD, and dual degrees (MD/PhD) were shown as possibilities.	● Made me focus more on my education goals (C2F3)

Biggest concerns of Introduction scholars about pursuing a career in science research

Table D12. Introduction scholars' biggest concerns about pursuing a career in science research

What are your biggest concerns about pursuing a career in science research? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Time commitment	● "The schooling. I don't want to go to school that long. It depends, like 10-15 years of school." (C1F3) ● Time of doing it, particularly when it's uncertain if you'd like it.	● Lot of money and time and have to make sure that you're really interested in it because you're going to devote a whole chunk of your life (C2F2)
Financial concerns	● "The amount of money it will cost. That's a big issue" (C1F1; C1F2)	● Financial resources- paying for college (C2F1)
Overcoming doubt	● Concern about failure (C1F2) ● "Cancer is so deadly – it affects a lot of people. The pressures of that – you want to help a lot of people." (C1F3)	● Overcoming doubt in self when it comes to education (C2F3)
Fear of losing interest	● "I would say for me time and dedication. It takes a lot of time to go into a field like cancer research. And I think commitment and just overall interest in what I want to do. I'm interested in science and cancer research but I don't know if it's my passion and something I want to do with a really good chunk of my life. So it's just exploring to see if this is something I really want to do because I'm not entirely sure." (C1F2)	● Staying engaged and passionate about work- don't know if I would be as passionate about it as others around me (C2F3) ● Realizing that I'm not as interested as I believed and feeling like I've lost my purpose (C2F3)
Sacrifices/compromise	Work-life balance is going to be very difficult. Everyone always asked the speakers that question. They said it was really hard. They had to go to work and be there for their families. They could only do those two things. (C1F1)	● It requires your mind when you're even at home. Going home on time, staying late. (C2F1) ● Struggle of maintaining personal life and work (C2F3)

Advice for future students who want to pursue a career in science research from Introduction scholars

Table D13. Advice from Introduction Scholars for future students who want to pursue a career in science research

What advice would you give a friend who wants to pursue a career in science research? Describes specific quotes or field notes describing themes.		
Theme	**Cohort 1 (In-Person Program**	**Cohort 2 (Virtual Program)**
Look for opportunities	● Start young (C1F2) "Look into it as young as you can. Get to know as much has possible before the end of high school, about the field and similar ones." ● Participate in training programs (C1F2) ● "Do as much shadowing as you can." (C1F3) ● "Get involved with your community." (e.g., local hospital, etc.; C1F3)	● Real experiences, we were able to see deeper, whether it's a program, shadowing or a mentor, see what it's really like (C2F1)
Network/ find mentors	● "Reach out to doctors even if you haven't met them or schools you want to go to and try to get summer internships because that will really help, like they want you to have hands on experience" (C1F2) ● "Call and talk to people that have already been through this and do your own research online or come to this camp" (C1F3)	● Mentorship and finding someone who can help you along the way (C2F3)
Stay committed	● "If there's not opportunities to take, make your own. Like when you're bored go online and read something about science and learn by yourself." (C1F2) ● "Plan ahead" (C1F3)	● Keep believing in self and know that it might be a long journey but keep believing (C2F3) ● Not give up because there is the possibility that you can do better the next time (C2F3)
Keep an open mind	● "Almost all doctors you've talked to have changed their career paths multiple times. So you've got to look at your interests as this or possibly this, and don't be afraid to change your path along the way." (C1F2)	● A lot of speakers had an idea of what they wanted to do but changed over time- have an open mind ● Look at the same thing as everyone but think differently (C2F3)

Impact of virtual training on Introduction Scholars

Table D14. Impact of virtual program setting on participation and engagement with the program

The program became virtual due to COVID-19. How did the program being virtual influence your participation or engagement with the program? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Felt like school	● Felt like back in school- but not much we could do about it. I know it would be much different in person (C2F3)
Made personal connections more challenging	● Did feel distant with others in the group (C2F3) ● If you have your camera off it feels like you aren't engaging; I'm really expressive so even with just my camera it feels awkward because for speakers they don't get to ready our body language and disengaging for them not just for us (C2F2)
Increased hesitation to participate	● Intimidating unmuting yourself and asking questions in bigger groups and feels rude to interrupt to ask questions (C2F2) ● Sometimes you want to talk but you get interrupted but someone doesn't know you're going to talk and its awkward staring through the screen. (C2F3)
More distracting	● Got more distracted; if it was in person I wouldn't get as easily distracted (C2F2) ● If I was there, I'd be all in like this is my life right now but being home was distracting (C2F2)
Connection issues	Glitching out during tour (C2F2) It's harder to focus looking at a screen with lagging and interruptions (C2F3)

Focus Group Script: Immersion

Table D15. Post-program focus group script for high school students in a 10-week cancer research training program

2021 Immersion Focus Group Script (10 week Virtual program)
● Anonymous icebreaker activity using Google Jamboard ○ What was your favorite thing you learned during the program this summer? ○ How do you plan to use the information you learned this summer in your life? ● About the program ○ What parts of the program did you like the most? Probes: meeting particular people, clinical shadowing, public health shadowing, outreach shadowing, OHSU research rotations ○ How did you feel about the different backgrounds and perspectives that were represented by the people you met? ○ What backgrounds and perspectives did you feel were not represented well? ○ What advice would you give to make the Immersion program better next year? ○ What parts of the program would you like to change? ○ What would you like to add to the program? ○ Jamboard Fist to Five: Are you interested in coming back for the Intensive program next year? Probe: why? ○ Jamboard Fist to Five: How likely are you to recommend this program to a friend? Probe: why? ● About STEM pursuits ○ What is unique about this opportunity compared to other STEM-focused activities available to you and your peers? (if time allows). Prompt: Can you provide examples? ○ What different types of research did you learn about this summer? ○ How did this program change your understanding of research? ○ How did this program change your attitudes about research? Probes: Biomedical research, Cancer research ○ How did this program change your attitudes about pursuing a career in research? ○ What different types of careers did you learn about? Probes: Biomedical research, Cancer research ○ Did this program change your educational goals? ○ What are your biggest concerns about pursuing a career in science research? ○ What advice would you give a friend who wants to pursue a career in science research? (note: if time) ● Virtual Participation ○ The program became virtual due to COVID-19. How did the program being virtual influence your participation or engagement with the program? Probe: What issues did you experience with the virtual nature of the program? ○ What should the National Institutes of Health or program organizers know when designing virtual programs like this? What would be an ideal length (weeks) or daily duration (hours of the day) ○ Cameras being on were emphasized – what should others know about why you did/did not use your camera?

Immersion Focus Group Results

Two focus groups were held with Cohort 1 participants who participated in the Immersion program. Each focus group included a facilitator and a note taker. The OHSU Evaluation Core's faculty and staff who served as external evaluators of the project developed themes. Focus groups were coded to denote which focus group they represented (e.g., 1-2) and that they occurred in the second year of the program (Y2): AD=C1Y2F1; AW=C1Y2F2.

Results are presented in script order, with themes summarized in tables:

- Favorite thing learned
- Plan to use information learned in their life
- Program components trainees liked most
- Representation
- Recommendations for improving the Introduction program
- Intention to return for Immersion training
- Likelihood of recommending Knight Scholars Program to a friend
- Uniqueness of this opportunity compared to other STEM-focused activities
- Impact of program on trainees' attitudes/understanding about research
- Impact of program on trainee's attitudes about pursuing a career in research
- Trainees' biggest concerns about pursuing a career in science research
- Advice for future students who want to pursue a career in science research
- Impact of virtual training on Immersion scholars (cohort 2 only)
- Considerations about small group vs large group sessions

Favorite thing learned in Immersion program

Table D16. Favorite thing learned during the Immersion program

What was your favorite thing you learned this week? Primarily written responses submitted via Google Jamboard	
Theme	**Cohort 2 (Virtual Program)**
Learning about careers	● Exploring different career paths and meeting new people (C1Y2F1) ● The new careers that I had no idea about (C1Y2F1)
Personal/professional growth	● Probably that I was perfectly capable of presenting and not dying while doing it (C1Y2F2) ● How to make friends/ be social from a virtual setting (C1Y2F2) ● How to ask questions (C1Y2F2) ● How to work in a team setting (C1Y2F2)
Meeting researchers	● My favorite thing I learned was getting to know the researchers and their labs, that was my favorite week by far (C1Y2F1)
Increased public health/cancer knowledge	● The public health weeks and learning about cancer and inequities ● Learning about public health and how it ties to cancer (C1Y2F1)
Tribal Health Program	● I really enjoyed learning about tribal health. I had no idea about any of it before this program. Definitely my favorite part (C1Y2F2)

Knight Scholars Immersion Focus Groups: Cohort 2 Summary

Plan to use information learned in the Immersion program in trainees' life

Table D17. Scholars' plan for using the information they learned during the Immersion program in their life

How do you plan to use the information you learned this week in your life? Primarily written responses submitted via Google Jamboard	
Theme	**Cohort 2 (Virtual Program)**
Professional Growth	● Job interviews (C1Y2F2) ● Future networking (C1Y2F2) ● I'll be able to do more research finding my career path (C1Y2F2)
Education Planning	● From the experience I had, apply it to school that's coming up maybe change majors because I found out some stuff about myself and interests (C1Y2F1)
Research Skills	● Using the experience in college like researching methods and the places to find reliable info (C1Y2F1) ● Finding reputable sources (C1Y2F2) ● Doing photovoice (C1Y2F2)
Careers not interested in pursuing	● Figured out what careers I don't want to go into- for example, clinical isn't for me (C1Y2F1) ● I found out that I am not interested in public health (C1Y2F1)
Personal Growth	● I will use my newfound confidence to present myself in a better light to others (C1Y2F2) ● Share with people I know, and that I am constantly surround by. Educating them on the important things I've learned that I think other people should know (C1Y2F2)

Immersion program components trainees liked most

Table D18. Program components that trainees liked most in Immersion program

What parts of the program did you like the most?	
Theme	**Cohort 2 (Virtual Program)**
Meeting Researchers	● "I like getting to hear each professionals' personal stories and paths to success. They were all different and had challenges, and not an easy path, it was inspirational." (C1Y2F1)
Peer Mentors	● "Peer mentors were great buddies, we'd talk about how our day went/weekend, it was a nice casual talk, but they were closer to our age and gave us great tips. They'd give us office hours to give us advice on our presentations. I hope they stay next year." (C1Y2F1)
Diversity	● "It was super diverse and really neat to see" (C1Y2F2)
Public Health Shadow	● "I liked the two public health weeks; liked how we could talk with other professionals and I wasn't lost in the material. I liked the outreach; it was more personal. I think I liked everything. The piece I liked is a lot of focused on inequities. I can easily understand everything." (C1Y2F1)
Research Rotations	● "I liked the research rotations as well as the peer mentors we had, it was great. I liked how they interacted with us, and made it fun. They would use large words and great analogies for us to understand." (C1Y2F1)
Clinical Shadow	● "I liked the clinical week and learning about simulation. For me, I'd rather be working with patients rather than being in the lab. I like the interaction." (C1Y2F1)

Representation of Immersion Program

Table D19. Representation of backgrounds and perspectives in the Immersion tier of the Knight Scholars Program

How did you feel about the different backgrounds and perspectives that were represented by the people you met? What backgrounds and perspectives did you feel were not represented well? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Good diversity of backgrounds and perspectives	• It was really diverse and cool to see. (C1Y2F2) • Many people from different backgrounds – ethnic backgrounds. (C1Y2F2)
Saw themselves represented	• "I didn't like/find a connection to a lot of the people, even though they were different, they were all the same and had a different path, but all got there. It wasn't diverse to me at all. I'd like to see more black people, more people of color. There weren't many at the sessions I attended." (C1Y2F1)
Missing or underrepresentation	• Diverse but I'd still like to see people of color. There weren't many people who look like me, which would be intimidating and makes it hard to relate sometimes (C1Y2F1) • Not many Hispanic/Latino (C1Y2F1) • I'd like to see more LGBTQ people (C1Y2F1) • It would have been great to see more black doctors. (C1Y2F2) • They could include more people with disabilities (C1Y2F2) • It would be nice to see someone from rural areas (C1Y2F2) • Native American backgrounds (C1Y2F2)

Recommendations for improving Immersion program

Table D20. Recommendations for improving the Immersion program in the future

What advice would you give to make the Immersion program better next year? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Ensure appropriate level of language	• When we were sent to a lab, they threw a lot of big words, it was a lot for us to take in because we didn't know the terminology, perhaps a handout prior would be helpful. (C1Y2F1) • Next year I'd recommend to break it down to a HS student to understand, I felt like they were talking a different language. I couldn't come up with questions about their research. (C1Y2F1)
Provide info on presentation to scholars ahead of time	• Information ahead of time, so you could better prepare (C1Y2F1)
Set expectations of scholars early on	• Holding people accountable from the beginning. (C1Y2F2) • We struggled with people participating and having their cameras on. (C1Y2F2) • It would be better to have those expectations set from the beginning. (C1Y2F2)
Protect break time	• Longer breaks, they would be cutting our breaks short when other meetings would go over. This happened a couple of times. (C1Y2F1)
More interactive	• We weren't talking to anyone for a long time. (C1Y2F2) • Wished people were interacting more and bouncing ideas off each other. (C1Y2F2) • Having more random interactions. (C1Y2F2) • Wished they would call on people more. (C1Y2F2)
Shorter sessions	• Some of the sessions are too long. (C1Y2F2) • The longer they are the easier it is to get distracted. • 45 minutes is great. (C1Y2F2) • Shorter is better (multiple students) (C1Y2F2) • An hour or less for virtual per person. (C1Y2F2) • Breaking it up is best. (C1Y2F2)

Intention to return for Intensive training

Table D21. Interest of Immersion scholars returning for ongoing training in Intensive program

Are you interested in coming back for the Intensive program next year? Describes specific quotes or field notes describing themes. Fist to five counts summed.	
Theme	**Cohort 2 (Virtual Program)**
Overall rating counts	Total: (n=9); 4 (n=2); 3.5 (n=2); 3 (n=5)
Want in-person	● If it's in person, I will definitely do it, but not online. (C1Y2F1) ● I want to continue it but I want it to be in person. ● I'm excited to hopefully be in person and have a different experience and work on a more personal level for future projects (C1Y2F2)
Unsure if have time	● Starting college and working (C1Y2F1) ● I don't know if I'll have time for it. (C1Y2F2) ● just because I'm unsure if I'll have time for getting ready for college (C1Y2F2)
Don't want to be away	● I don't want to miss and be away for 5-6 weeks from my friends in the summer. Online, we're done at 2 and I can still go do stuff. (C1Y2F1)

Likelihood of Immersion scholars recommending Knight Scholars Program to a friend

Table D22. Likelihood of recommending the Knight Scholars Program to a friend

How likely are you to recommend this program to a friend? Describes specific quotes or field notes describing themes. Fist to five counts summed.	
Theme	**Cohort 2 (Virtual Program)**
Overall rating counts	5 (n=7); 4 (n=4)
Great opportunity	● Great opportunity, opens your eyes and gives you perspective on things you didn't know (C1Y2F1) ● I loved the opportunity to talk to people and build my resume. (C1Y2F2) ● Great experience and can make connections (C1Y2F1)
Paid	● Great opportunity, transforming experience and exposure to the health and science field, the financial incentive, research experience. That will set you aside from a lot of your peers. You cannot find something like this in other places. (C1Y2F1)
Self-Reflective	● Learning more about myself. (C1Y2F2)

Uniqueness of this opportunity compared to other STEM-focused activities reported by Immersion scholars

Table D23. Uniqueness of the Knight Scholars Program opportunity compared to other STEM-focused activities available per Immersion scholars

What is unique about this opportunity compared to other STEM- focused activities? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Connections with researchers	● The kind of people we can meet and talk with. (C1Y2F2) ● I was never expecting [scientist] to come to the meeting and talk to me. (C1Y2F2) ● Down to earth doctors (C1Y2F2)
Going to OHSU	● Being able to go to OHSU & stay in the dorms (C1Y2F2)
Stipend	● Paid opportunity was an incentive

Impact of Immersion program on trainees' attitudes or understanding about research

Table D24. How the Knight Scholars Program (Introduction tier) changed trainees' attitudes/understanding about research

How did this program change your attitudes/understanding about research? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
More likely to do research	● It changed my mind; I could see myself doing research in psychology. I find it interesting. (C1Y2F1) ● I found research boring because it's a lot of work, but after sitting in I was changing my mind a little, I do like it now. I like history, but when it comes to science, the sub-topic within science can be interesting. It all depends on the topic you want to research. (C1Y2F1)
Increased understanding of research	● Cancer research: I found it more interesting, there's a lot you can do in it. I'm interested in prevention. (C1Y2F1) ● It broadened the spectrum of the medical field. (C1Y2F2) ● There are a lot more people involved than you think. (C1Y2F2) ● We saw a bunch of researchers doing a lot of different things. (C1Y2F2)
Difficulty of research	● Research is harder than people make it look! (C1Y2F2) ● Researching is not as hard as it looks but it's not easy either you just have to have good resources and I used to find researching boring but I can see myself doing this as well (C1Y2F1)

Impact of Immersion program on trainees' attitudes about pursuing a career in research

Table D25. Impact of Immersion program on changing trainee attitudes about pursuing a career in research

How did this program change your attitudes about pursuing a career in research? (Immersion) Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
More attainable	● I feel like the medical field is more attainable (C1Y2F2)
Found fields they are interested in	● I'm more interested in biostatistics (C1Y2F2) ● It helped me realize that I really like radiology (C1Y2F2)
Want patient focus	● I find the research side is interesting but I'd rather be more in patient (C1Y2F2)
Better idea for major	● I didn't really know much about different majors and this program helped me narrow it down. (C1Y2F2) ● I want to major in psych or sociology. (C1Y2F1) ● In terms of finding a major, yes! (C1Y2F2)

Biggest concerns of Immersion scholars about pursuing a career in science research

Table D26. Immersion scholars' biggest concerns about pursuing a career in science research.

What are your biggest concerns about pursuing a career in science research? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Not being accepted	● Not being accepted, I don't like being in places where I'm the only Black person. Those situations weren't fun and uncomfortable. That's my biggest hesitation about going into a scientific field (C1Y2F1) ● Due to the lack of Black people in the field, I feel like I don't know if I would be accepted; I don't want to sacrifice my authenticity to be accepted in that field of work. I don't want to feel like I have to conform. I want room for creativity and expression. The cost of some programs (masters), I'm more drawn to film, journalism, arts. (C1Y2F1)
Burn out	● Getting tired, it's a lot of work or burnt out (C1Y2F2) ● Work - life balance (C1Y2F2)
Financial	● So expensive (C1Y2F2) ● Pay levels (C1Y2F2)

Advice for future students who want to pursue a career in science research from Introduction scholars

Table D27. Advice from Introduction Scholars for future students who want to pursue a career in science research

What advice would you give a friend who wants to pursue a career in science research? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Opportunities like Knight Scholars Program	● You should sign up for the Knight Scholars program; connect them to [staff; program coordinator referenced]. Get your resume together and start working on your application and get help from the school counselor/career coordinator. I'd recommend putting my name down as a referral. (C1Y2F1) ● To get your foot in the door with programs like this! (C1Y2F2)
Do your research	● Look very closely into it before you make any finalizing moves (C1Y2F2)

Impact of virtual setting on engagement and participation in the Immersion program

Table D28. Impact of virtual setting on engagement and participation for scholars in the Immersion program

How did the program being virtual influence your participation and engagement? Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Cameras on was challenging	● We understood people wanted to see our faces, but it was a lot, 9-2 sitting staring at a screen is a lot (C1Y2F1) ● It was hard to have cameras on, especially coming from online schooling. I didn't get a break from it. Zoom fatigue and home circumstances make it hard to always have it on. (C1Y2F1) ● I think my appearance would impact a lot if i wanted to turn on my camera on or not (C1Y2F1) ● I have bad anxiety and get anxious being on camera for a long time. I look at the way I look and get too focused on that and get very anxious. Our mental health can be impacted. It makes my brain and my body anxious. (C1Y2F1) ● I felt I was too tired so I would fall asleep and didn't want anyone to see or I needed to get up and move around my room (C1Y2F2)
Felt like school	● Negatively impacted my engagement; but feel like I'd get more out of it in person. Just like online schooling, I didn't learn that much this last year. I learn more in person. You can be present. I don't think I could personally do online again as I don't do well in an online environment (C1Y2F1)
More easily distracted	● "I fell asleep a few times" (C1Y2F2) ● I was getting distracted (C1Y2F2) ● It was hard to stay focused (C1Y2F2)
Headaches from being online all day	● I got lots of headaches (C1Y2F2) ● There were days I did not want to come because it made my head hurt (C1Y2F2) ● It was very hot and I struggled with migraines (C1Y2F2)
Connectivity limitations	● Poor internet connectivity (C1Y2F2) ● Wi-Fi issues; I had to use my phone at one point which used up all my data (C1Y2F1)

Recommendations from Immersion scholars on group sizes (small vs large)

Table D29. Immersion scholar recommendations about sizes of group sessions

Small Group versus Large Group Sessions Describes specific quotes or field notes describing themes.	
Theme	**Cohort 2 (Virtual Program)**
Bigger Group Pros	● I liked the bigger groups with all the Knight Scholars because it felt fuller, some regions would have a great session that I could have joined, since we were divided by region. (C1Y2F1)
Smaller Group Cons	● Smaller groups got awkward faster and felt the pressure of coming up with a question. When there's more people there are more heads for questions to flow. (C1Y2F1) ● Sometimes I wanted to join other sessions. (C1Y2F1)