Clinical and Translational Research Training Needs Assessment

RESULTS REPORT

BACKGROUND

The Hispanic Alliance conducted a "Clinical and Translational Research Training Needs Assessment" to provide training and professional development activities that respond to the investigators needs according to a set of core competencies needed to become an effective clinical and translational researcher. This collaborative effort was led by the Professional Development Core (PDC) and the Tracking and the Evaluation Core (TEC). We explored training interests across the clinical and translational research thematic areas and competencies developed by the National Institutes of Health-Clinical and Translational Sciences Award (NIH-CTSA)[1], activity coordination preference and perceived barriers to conduct research at their academic institution.

An anonymous online survey was administered via REDCap and was designed to be completed in approximately 10 minutes. We invited faculty and researchers affiliated to Alliance participating institutions to participate in this assessment. Data collection was from October 21, 2020 to January 28, 2021 including weekly email follow up in order to increase response rate. A total of 1,461 email invitations were sent and 149 individuals completed the assessment. This report summarizes the findings by Alliance participating institutions.

PARTICIPANT PROFILE

Table 1. Participant Profile

Characteristic	n(%)
Main Institution Affiliation (n=149)	
UPR Medical Sciences Campus	94 (63.2)
Ponce Health Sciences University	40 (26.8)
Universidad Central del Caribe	9 (6.0)
Other San Juan Bautista School of Medicine (n=2); UPR Comprehensive Cancer Center (n=3); and Ponce (n=1).	6 (4.0)
Academic Level (n=145)	
Professor	52 (35.9)
Assistant Professor	37 (25.5)
Associate Professor	32 (22.1)
Adjunct Professor	10 (6.2)
Investigator/ Researcher	9 (6.2)
Instructor	4 (2.7)
Other Clinical Rotation Preceptor (n=1); and Research Project Manager (n=1).	2 (1.4)
Highest Academic Degree (n=147)	
PhD	66 (44.9)
MD	31 (21.1)
DrPH	10 (6.8)
EdD	9 (6.1)
DMD/DDS	9 (6.1)
MS	8 (5.4)
MD/PhD	3 (2.0)
PharmD	3 (2.0)
PsyD	3 (2.0)
Other MPH (n=1), DNS (n=1); AuD (n=1); DPT (n=1); and PhD/DMD (n=1).	5 (3.4)

CLINICAL AND TRANSLATIONAL RESEARCH TRAINING NEEDS

Table 2. Thematic Areas of Interest by Alliance Institutions

Thematic Areas	n(%)			
	Overall (n=149)	UPR-MSC (n=94)	PHSU (n=40)	UCC (n=9)
Bench to bedside collaboration	31 (20.8)	19 (20.2)	8 (20.0)	3 (33.3)
Bedside to community translational research	40 (26.8)	24 (25.5)	11 (27.5)	2 (22.2)
Establish and maintain collaborations and teams	54 (36.2)	32 (34.0)	17 (42.5)	2 (22.2)
Mentoring	41 (27.5)	22 (23.4)	15 (37.5)	4 (44.4)
Scientific communication	52 (34.9)	30 (31.9)	18 (45.0)	3 (33.3)
Recruitment and retention of study participants	37 (24.8)	21 (22.3)	11 (27.5)	3 (33.3)
Monitoring protocol adherence	23 (15.4)	16 (17.0)	6 (15.0)	-
Ethical issues in research	14 (9.4)	9 (9.6)	2 (5.0)	2 (22.2)
IRB reciprocity	24 (16.1)	12 (12.8)	10 (25.0)	1 (11.1)
National Clinical Trials Registration	28 (18.8)	15 (16.0)	10 (25.0)	2 (22.2)
Designing research studies	52 (34.9)	33 (35.1)	12 (30.0)	5 (55.6)
Data analysis for research studies	**74 (49.7)**	**50 (53.2)**	17 (42.5)	**6 (66.7)**
Data safety monitoring	29 (19.5)	15 (16.0)	10 (25.0)	4 (44.4)
Data security	31 (20.8)	19 (20.2)	7 (17.5)	5 (55.6)
Data collection strategies and instruments design	53 (35.6)	37 (39.4)	12 (30.0)	3 (33.3)
REDCap data collection platform	60 (40.3)	31 (33.0)	**25 (62.5)**	3 (33.3)
Laboratory techniques	9 (6.0)	2 (2.1)	4 (10.0)	3 (33.3)
I am not interested in receiving training	7 (4.7)	2 (2.1)	3 (7.5)	1 (11.1)

Note: The overall data per row might not be equal to the sum from the three main Alliance participating institutions because other institutions were presented in this table.

Table 3. Research Competencies of Interest by Alliance Institutions

Research Competencies within each Thematic Area	n(%)			
	Overall (n=149)	UPR-MSC (n=94)	PHSU (n=40)	UCC (n=9)
Bench to bedside collaboration	31 (20.8)	19 (20.2)	8 (20.0)	3 (33.3)
Bedside to community translational research	40 (26.8)	24 (25.5)	11 (27.5)	2 (22.2)
Establish and maintain collaborations and teams	54 (36.2)	32 (34.0)	17 (42.5)	2 (22.2)
Translational and multidisciplinary team dynamics	29 (19.5)	19 (20.2)	9 (22.5)	-
Translational and multidisciplinary teamwork frameworks	40 (26.8)	22 (23.4)	14 (35.0)	2 (22.2)
Industry partners	15 (10.1)	8 (8.5)	4 (10.0)	2 (22.2)
Community partners	26 (17.4)	14 (14.9)	10 (25.0)	2 (22.2)
Mentoring	41 (27.5)	22 (23.4)	15 (37.5)	4 (44.4)
Best practices for mentoring	33 (22.1)	15 (16.0)	14 (35.0)	4 (44.4)
Career development tools and strategies	30 (20.1)	13 (13.8)	13 (32.5)	4 (44.4)
Scientific communication	52 (34.9)	30 (31.9)	18 (45.0)	3 (33.3)
Scientific writing	38 (25.5)	20 (21.3)	15 (37.5)	3 (33.3)
Grant writing	42 (28.2)	25 (26.6)	13 (32.5)	3 (33.3)
Sources of funds	26 (17.4)	16 (17.0)	7 (17.5)	3 (33.3)
Types of grants	27 (18.1)	16 (17.0)	8 (20.0)	3 (33.3)
Steps of the grant writing process	35 (23.5)	20 (21.3)	11 (27.5)	3 (33.3)
Other: Collaborative grants (n=1)	1 (0.67)	1 (1.1)	-	-
Manuscript preparation	35 (23.5)	19 (20.2)	13 (32.5)	3 (33.3)
Communication to general public	21 (14.1)	11 (11.7)	7 (17.5)	3 (33.3)
Recruitment and retention of study participants	37 (24.8)	21 (22.3)	11 (27.5)	3 (33.3)
Monitoring protocol adherence	23 (15.4)	16 (17.0)	6 (15.0)	-
Ethical issues in research	14 (9.4)	9 (9.6)	2 (5.0)	2 (22.2)
Ethical issue in research reported: ‡Applied ethics in the research (n=1); ‡Multiple authors manuscripts and fairness in collaborations (n=1); ‡ Use of human subjects (n=1); †Rigor and reproducibility, data handling and analysis, confidentiality and future use (n=1); and †Community population approach (n=1).	6(4.0)	3 (3.2)‡	2(5.0)†	-
IRB reciprocity	24 (16.1)	12 (12.8)	10 (25.0)	1 (11.1)
National Clinical Trials Registration	28 (18.8)	15 (16.0)	10 (25.0)	2 (22.2)
Designing research studies	52 (34.9)	33 (35.1)	12 (30.0)	5 (55.6)
Research questions	24 (16.1)	13 (13.8)	6 (15.0)	3 (33.3)
Study design	39 (26.2)	28 (29.8)	7 (17.5)	3 (33.3)
Cohort study (prospective observational study)	29 (19.5)	20 (21.3)	7 (17.5)	1 (11.1)
Cross-sectional	27 (18.1)	19 (20.2)	6 (15.0)	1 (11.1)
Case-control	20 (13.4)	15 (16.0)	4 (10.0)	1 (11.1)
Other Case Series (n=1); and Clinical Trials (n=1).	2 (1.3)	2 (2.1)	-	-
Research method	32 (21.5)	18 (19.1)	10 (25.0)	3 (33.3)
Qualitative	21 (14.1)	12 (12.8)	5 (12.5)	3 (33.3)
Quantitative	24 (16.1)	12 (12.8)	8 (20.0)	3 (33.3)
Mixed methods	25 (16.8)	15 (16.0)	6 (15.0)	3 (33.3)
Data analysis plan	34 (22.8)	22 (23.4)	8 (20.0)	4 (44.4)
Systematic errors	23 (15.4)	11 (11.7)	8 (20.0)	4 (44.4)
Sampling techniques	27 (18.1)	13 (13.8)	9 (22.5)	4 (44.4)
Sample size and statistical power	34 (22.8)	20 (21.3)	10 (25.0)	4 (44.4)
Data analysis for research studies	74 (49.7)	50 (53.2)	17 (42.5)	6 (66.7)
Assumptions behind different statistical methods	40 (26.8)	22 (23.4)	13 (32.5)	5 (55.6)
Descriptive and inferential statistics	39 (26.2)	22 (23.4)	12 (30.0)	5 (55.6)

Research Competencies within each Thematic Area	n(%)			
	Overall (n=149)	UPR-MSC (n=94)	PHSU (n=40)	UCC (n=9)
Meta-analytic methods	40 (26.8)	24 (25.5)	10 (25.0)	5 (55.6)
Regression models	43 (28.9)	25 (26.6)	13 (32.5)	5 (55.6)
Multilevel regression models	39 (26.2)	22 (23.4)	13 (32.5)	3 (33.3)
Propensity score analysis	28 (18.8)	15 (16.0)	8 (20.0)	4 (44.4)
Structural equation modeling	23 (15.4)	12 (12.8)	7 (17.5)	3 (33.3)
Qualitative data analysis	55 (36.9)	38 (40.4)	12 (30.0)	4 (44.4)
Visualization of data results	42 (28.2)	26 (27.7)	13 (32.5)	3 (33.3)
Data safety monitoring	29 (19.5)	15 (16.0)	10 (25.0)	4 (44.4)
Data security using cloud storage	31 (20.8)	19 (20.2)	7 (17.5)	5 (55.6)
Encrypting data	26 (17.4)	17 (18.1)	5 (12.5)	4 (44.4)
Data security	31 (20.8)	19 (20.2)	7 (17.5)	5 (55.6)
Data collection strategies and instruments design	53 (35.6)	37 (39.4)	12 (30.0)	3 (33.3)
REDCap data collection platform	60 (40.3)	31 (33.0)	25 (62.5)	3 (33.3)
Basic tools for new users	51 (34.2)	26 (27.7)	22 (55.0)	2 (22.2)
Advanced modules	31 (20.8)	17 (18.1)	11 (27.5)	3 (33.3)
Data collection instruments for longitudinal studies	43 (28.9)	20 (21.3)	20 (50.0)	3 (33.3)
Mobile App	34 (22.8)	19 (20.2)	13 (32.5)	2 (22.2)
Other Online consent (n=1)	1 (0.7)	1 (1.1)	-	-
Laboratory techniques	9 (6.0)	2 (2.1)	4 (10.0)	3 (33.3)
Lab techniques reported: ‡Next generation sequencing (n=1); †iPS cells (n=1); †Metabolomics (n=1); †Proteomics, RNAscope, and CRISPR (n=1); †Real-time PCR, DNA sequencing, and imaging (confocal microscopy) (n=1); and *Platelet physiology (n=1).	6 (4.0)	1 (1.1) ‡	4 (10.0)†	1 (11.1)*

Note: The overall data per row might not be equal to the sum from the three main Alliance participating institutions because other institutions were presented in this table.

TRAINING COORDINATION PREFERENCE

Table 4. Training Duration and Time Preferred by Alliance Institutions

Preference	Mean (SD)			
	Overall	**UPR-MSC**	**PHSU**	**UCC**
Duration				
Short length (less than 2 hrs)	**3.71** (0.56)	**3.74** (0.58)	**3.65** (0.54)	**3.50** (0.54)
Half-day (approx. 4hrs)	2.98 (0.78)	3.04 (0.77)	2.87 (0.76)	3.00 (1.00)
Full-day (approx. 8hrs)	2.15 (0.86)	2.16 (0.85)	2.03 (0.90)	2.29 (0.77)
Multiple days (1-2 days)	2.22 (0.91)	2.25 (0.92)	2.21 (0.96)	2.29 (0.76)
Time				
Morning (8:00 - 11:00 am)	**3.14** (0.91)	**3.13** (0.94)	**3.22** (0.79)	3.14 (0.90)
Lunch (12:00 - 1:00 pm)	2.74 (1.06)	2.60 (1.06)	3.03 (1.02)	**3.25** (0.71)
Afternoon (1:00 - 5:00 pm)	2.84 (0.94)	2.72 (0.97)	2.97 (0.88)	3.00 (0.93)
Evening (After 5:00pm)	2.29 (1.03)	2.22 (1.02)	2.52 (0.94)	2.29 (1.38)

Note: The duration and time preferences were evaluated by using a 4-point scale with scores ranging from 1 = *Very Unlikely* to 4 = *Very Likely.*

Table 5. Most Convenient Day to Attend Trainings by Alliance Institutions

Top 1	n(%)			
	Overall (n=134)	UPR-MSC (n=87)	PHSU (n=36)	UCC (n=6)
Monday	25 (18.7)	14 (16.1)	6 (16.7)	1 (16.7)
Tuesday	26 (19.4)	17 (19.5)	**8 (22.2)**	1 (16.7)
Wednesday	19 (14.2)	11 (12.6)	7 (19.4)	1 (16.7)
Thursday	16 (11.9)	11 (12.6)	4 (11.1)	1 (16.7)
Friday	**38 (28.4)**	**28 (32.2)**	7 (19.4)	**2 (33.3)**
Saturday	10 (7.5)	6 (6.9)	4 (11.1)	1 (16.7)
Top 2	**Overall (n=133)**	**UPR-MSC (n=85)**	**PHSU (n=35)**	**UCC (n=8)**
Monday	16 (12.0)	11 (12.9)	4 (11.4)	1 (12.5)
Tuesday	22 (16.5)	13 (15.3)	5 (14.3)	2 (25.0)
Wednesday	29 (21.8)	**20 (23.5)**	4(11.4)	**4 (50.0)**
Thursday	**30 (22.6)**	**20 (23.5)**	9 (25.7)	-
Friday	29 (21.8)	17 (20.0)	**10 (28.6)**	1 (12.5)
Saturday	7 (5.3)	4 (4.7)	3 (8.6)	-
Top 3	**Overall (n=134)**	**UPR-MSC (n=86)**	**PHSU (n=35)**	**UCC (n=8)**
Monday	**39 (29.1)**	**25 (29.1)**	**10 (28.6)**	**4 (50.0)**
Tuesday	14 (10.4)	9 (10.5)	2 (5.7)	2 (25.0)
Wednesday	29 (21.6)	20 (23.3)	6 (17.1)	1 (12.5)
Thursday	18 (13.4)	12 (14.0)	5 (14.3)	-
Friday	22 (16.4)	12 (14.0)	**10 (28.6)**	-
Saturday	12 (9.0)	8 (9.3)	2 (5.7)	1 (12.5)

Note: The overall data per row might not be equal to the sum from the three main Alliance participating institutions because other institutions were presented in this table.

Table 6. Training Modality Preferred to Attend Trainings by Alliance Institutions

Top 1	n(%)			
	Overall (n=138)	UPR-MSC (n=89)	PHSU (n=36)	UCC (n=8)
Hands-on workshop	25 (18.1)	17 (19.2)	3 (8.3)	**5 (62.5)**
Seminar / Conference	14 (10.1)	10 (11.2)	2 (5.6)	-
Video conference	21 (15.2)	10 (11.2)	10 (27.8)	1 (12.5)
Webinar	36 (26.2)	22 (24.7)	**11 (30.6)**	2 (25.0)
Online courses	42 (30.4)	**30 (33.7)**	10 (27.8)	-
Top 2	**Overall (n=134)**	**UPR-MSC (n=85)**	**PHSU (n=35)**	**UCC (n=8)**
Hands-on workshop	16 (11.9)	12 (14.0)	4 (11.4)	**4 (50.0)**
Seminar / Conference	28 (20.9)	13 (15.1)	10 (28.6)	-
Video conference	26 (19.4)	21 (24.4)	2 (5.7)	2 (25.0)
Webinar	**37 (27.6)**	**22 (25.6)**	**13 (37.2)**	1 (12.5)
Online courses	27 (20.1)	18 (20.9)	6 (17.1)	1 (12.5)

Note: The overall data per row might not be equal to the sum from the three main Alliance participating institutions because other institutions were presented in this table.

Top 3	n(%)			
	Overall (n=133)	UPR-MSC (n=87)	PHSU (n=34)	UCC (n=7)
Hands-on workshop	35 (26.4)	**24 (27.6)**	**9 (26.5)**	-
Seminar / Conference	22 (16.5)	16 (18.4)	6 (17.6)	-
Video conference	**37 (27.8)**	23 (26.4)	9 (26.5)	**3 (42.9)**
Webinar	14 (10.5)	12 (13.8)	1 (2.9)	1 (14.2)
Online courses	25 (18.8)	12 (13.8)	**9 (26.5)**	**3 (42.9)**

Note: The overall data per row might not be equal to the sum from the three main Alliance participating institutions because other institutions were presented in this table.

PERCEIVED BARRIERS TO CONDUCT RESEARCH

Table 7. Perceived Barriers to Conduct Research at their Main Institutions

In my main institution affiliation, there is a need for...	Mean (SD)			
	Overall	**UPR-MSC**	**PHSU**	**UCC**
Research funding support	**3.35 (0.74)**	**3.43 (0.73)**	**3.15 (0.70)**	**3.75 (0.46)**
Research proposal development support	3.08 (0.89)	3.34 (0.75)	2.48 (0.91)	3.44 (0.73)
Study participant recruitment	2.67 (0.85)	2.77 (0.83)	2.58 (0.86)	2.71 (0.76)
Statistical consultation services	2.95 (0.89)	3.03 (0.83)	2.89 (0.88)	3.11 (0.93)
Data analysis support services	2.96 (0.82)	3.06 (0.81)	2.81 (0.82)	3.11 (0.78)
Data sources for clinical research	2.78 (0.92)	2.94 (0.81)	2.58 (1.03)	3.00 (0.82)
Electronic data storage	2.48 (0.86)	2.61 (0.79)	2.24 (0.86)	2.83 (0.75)
Research coordination	2.72 (0.85)	2.91 (0.81)	2.43 (0.80)	2.43 (0.54)
IRB inter-institutional collaboration	2.44 (0.87)	2.63 (0.85)	2.09 (0.82)	2.57 (0.54)
Protected time for research	3.26 (0.92)	3.38 (0.87)	3.11 (0.98)	3.00 (1.00)
Research grant administration support	2.99 (0.97)	3.32 (0.78)	2.37 (0.99)	3.00 (1.00)
Facilities to conduct research	2.63 (0.89)	2.76 (0.83)	2.41 (0.91)	2.78 (0.83)
Shared instrumentation/equipment	2.65 (0.86)	2.83 (0.74)	2.36 (0.93)	3.00 (1.00)
Regulatory consultation services	2.59 (0.87)	2.79 (0.79)	2.29 (0.87)	2.67 (0.87)
Community partners for research	2.55(0.89)	2.78 (0.85)	2.13 (0.78)	2.78 (0.97)
Scientific writing support	3.05 (0.87)	3.30 (0.74)	2.49 (0.93)	3.22 (0.67)
Mentor's time and commitment	2.95 (0.89)	3.15 (0.81)	2.64 (0.96)	3.00 (0.50)
Mentor's expertise	2.78 (0.97)	3.00 (0.92)	2.37 (0.97)	2.89 (0.78)
Mentor's support	2.78 (0.92)	2.99 (0.86)	2.43 (0.99)	2.78 (0.67)

Note: The perceived barriers were evaluated by using a 4-point scale with scores ranging from 1 = *Strongly Disagree* to 4 = *Strongly Agree.*

Figure 1. Additional Barriers Identified to Conduct Research at their Main Institutions

UPR-MSC	PHSU

Research Culture (n=3)

→ *If the administrative body in your school does not know what research all is about, then you are in big trouble to request understanding and support. Please, Please, provide mandatory training to them [administration], if they want more money for grants, they have to do their part.*

→ *UPR-MSC is not cultural research institution.*

→ *Poor research culture and support by the administration.*

Administrative Support (n=2)

→ *Administrative support to accomplish with studies due dates and tasks.*

→ *Availability of administrative support.*

Other (n=3)

→ *Bureaucracy in our Campus.*

→ *Support for training.*

→ *There is a need for basic-clinical sciences collaboration. I am interested in data-mining electronic medical records. This is difficult and is not listed above.*

Mentor (n=3)

→ *Educate possible mentors then count with them to proceed in the programs.*

→ *In public health, mentors are needed for junior faculty.*

→ *Lack of cooperation of senior investigators in my institution. I understand that they may request the interest of other investigators or faculty to collaborate in the different phases of the process. The same in other institutions where research is carried out.*

Time (n=3)

→ *Small faculty - time and effort needed to make academic administration and committee work function well reduces time protected to develop and conduct research guaranteed base salary is low - makes establishing as an ESI [early-stage investigator] more difficult.*

→ *The time protected is not enough.*

→ *Time protected.*

Other (n=1)

→ *I think the main factor is that my position is as a teacher, so I have other roles to fulfill. Research work is done secondarily unless there are funds with which the time can be purchased.*

PARTICIPANTS FEEDBACK

Figure 2. Participant Feedback

SUGGESTIONS ON HOW TO BETTER SUPPORT YOUR TRAINING NEEDS

→ *Assistance in connecting with potential collaborators. Assistance in identifying potential external funding sources.*

→ *Focus on research changes during emergencies like the one that we are experiencing with COVID -19. [For example], how to continue research…*

→ *I have been fortunate to receive administrative support since the PRCTRC and hope I can continue to count on their services in the future.*

→ *I would suggest organizing a kick-off meeting with potential trainees to discuss possible timeline of activities and deadlines.*

→ *Join the faculty teams.*

→ *Interested in learning ways to improve access to and analysis of EMR [Electronic Medical Record].*

→ *It will be very convenient that when the in-person training can re-start, that several of them could be given at Ponce. Having most (if not all) trainings at Rio Piedras or the metro area, makes it difficult for me to attend and I would think there are several researchers in the area that would also benefit from have trainings at Ponce.*

→ *Organize hands-on workshop.*

→ *Proposal review.*

→ *Train supervisors or administrators to guide their staff: on their professional development One-on-one reviews with supervisor or careers advisors are extremely important to discuss professional or career development unfortunately we lack these types of career development tools.*

ADDITIONAL COMMENTS AND RECOMMENDATIONS

→ *I hope that really considered the information obtained through this survey.*

→ *If project coordination services related to research that is to take place within the facility will be incorporated to the Alliance, it would facilitate the achievement of study goals.*

→ *Need commitment from the administration to take action in the most urgent needs for excellence in cancer research.*

→ *Organize grant review panels to help obtain successful grants. Match successful researchers in getting funding with ones struggling to help get to know which approaches are preferred by the particular funding agency.*