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SPECIAL RESEARCH REPORT

On-site exposure to clinical epilepsy practice for experimental scientists engaged in epilepsy research: A pilot study by the ILAE commission on neurobiology

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Abstract

Educational initiatives that address the gap between basic/preclinical and clinical practices are important to effectively translate basic science discoveries to benefit patients. The ILAE Neurobiology Commission conducted a pilot project aimed at exposing basic and preclinical scientists engaged in epilepsy research to general clinical issues pertaining to the diagnosis and care of people

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with epilepsy. This aim was addressed through a two-week-long, on-site clinical training program for 50 basic scientists in 21 epilepsy centers across 18 countries in the six ILAE regions (with a maximum of 3 basic scientists per center). The learning objectives and the training module were discussed and defined by the project organizing committee, which consisted of Neurobiology Commission members and a team of epileptologists representing different geographical regions. The training activities were conducted at each epilepsy center under the local supervision of clinical tutors. Each basic scientist was exposed to 50.3 ± 23.3 (range 16–89) hours of intensive and dedicated clinical training, coordinated by 2–3 tutors per center, assisted by 6.8 ± 3.6 colleagues. A structured test consisting of 17 general clinical epilepsy questions was completed by the trainees before and after the training activity. The learning assessment was based on the comparison between responses to the exit and entry tests. After the on-site clinical exposure, the proportion of correct answers increased to 87% compared to 61% in the entry test. Structured post-training questionnaires demonstrated very high satisfaction of trainees and all involved tutors across the different aspects of the training module. This global pilot study demonstrated that on-site attendance by basic scientists in specialized clinical settings up-scaled their knowledge of clinical epileptology and facilitated networking with clinicians. Expansion of this pilot to further centers should be considered to understand how exposure to clinical practice affects research direction and quality of translational epilepsy research.

Plain Language Summary: Epilepsy research has long benefitted from collaboration between scientists and clinicians. Early exposure of researchers to people with epilepsy and their care teams may strengthen future impact. This pilot study tested a two-week immersive experience where small teams of basic scientists shadowed clinicians during their work at hospitals around the world. Questionnaires showed high satisfaction among both groups. Results support expanding such training, with the backing of the International League Against epilepsy and aligned centers, to build understanding, interest, and long-term commitment, ensuring bench research is informed by and translates to clinical practice and improved quality of life for patients.

KEYWORDS

basic science, education, epilepsy training, neurobiology

1 | INTRODUCTION

Translational research in medicine is defined as the scientific process that transforms the way research is done to achieve more impactful interventions to improve the health of individuals (https://ncats.nih.gov/about/about-translational-science).[1] One of the objectives of translational research is to seek new strategies to translate basic science discoveries into patient benefit, reducing the conceptual and technical gaps between bench- and clinic-based investigation and practices. A way to pursue this goal within medical settings is to develop educational initiatives that address these gaps. One of the key elements to facilitate this process is to equip medical scientific societies with committees dedicated to basic science that bring together clinicians and basic scientists engaged in preclinical research.

The Neurobiology Commission of the International League Against Epilepsy (ILAE-NBC) was established in 1988 to "*promote epilepsy neurobiology research through advocacy, education and training, focusing on* *improving methodologies, infrastructure, and career opportunities for young investigators"* (https://www.ilae.org/about-ilae/structure-and-working-groups/commissions-and-sections/commission-on-neurobiology). The ILAE-NBC established a specific translational research task force in 2013, later joined by the American Epilepsy Society, formed by a working group that developed new strategies to improve preclinical epilepsy impact.[2] Within this framework and in parallel with the activities of the ILAE Research and Innovation Task Force, a pilot program was launched to develop an on-site training focused on exposing non-clinician scientists to fundamental aspects of clinical epileptology. The need for such training was assessed through a preliminary survey conducted within a global community of basic and preclinical scientists (e.g., non-clinician researchers without formal clinical training) engaged in experimental epilepsy research. This global survey provided insights into the relationship between basic and clinical epileptologists.[3] Based on the analysis of the survey output, members of the ILAE-NBC educational working group elaborated five main learning objectives for a tailored training activity that would address the needs identified by the basic science community: (1) update the rapidly evolving concepts of clinical epileptology, (2) appreciate that a large range of diseases present with spontaneous epileptic seizures, (3) familiarize with clinical terminology, (4) highlight the scientific value of clinical epileptology and clinical research, and (5) raise awareness of the risks of conceptual oversimplification. These topics have also emerged in recent years during training activities at ILAE-supported International Courses focused on bridging basic science with clinical epileptology, such as the San Servolo Summer School Course and the Latin America Summer School in Epilepsy, among others.

The present report of the multicenter, observational pilot study with pre–post assessment of educational outcomes has several objectives: (1) to describe the organization of an on-site (i.e. hospital-based) clinical training program dedicated to basic scientists; (2) to evaluate the feasibility of a locally organized pilot exposure in epilepsy centers across five continents and six ILAE Regions, (3) to describe the results of the pilot on-site clinical exposure tailored for basic scientists, (4) to detail the training activities and verify the resources necessary to implement such a program, and (5) to demonstrate the educational value achieved by the training. The pilot project was designed to be accessible in all regions of the world, in accordance with ILAE general principles and mission (https://www.ilae.org/about-ilae/ilae-mission-goals-and-strategy).

Key points

- Innovative strategies are needed to bridge the gap between basic and clinical researchers/practice in the field of epilepsy.
- On-site attendance of basic scientists in clinical services is a feasible and low-cost strategy.
- Tailored clinical programs to expose basic/preclinical scientists to clinical practice in epilepsy can be offered in different regions of the world.
- Improvement in basic scientists' understanding of clinical epilepsy practice is achieved through an intensive experience in a receptive clinical setting.
- The proposed educational module facilitates interactions between clinicians and basic scientists.

2 | ORGANIZATION OF THE TRAINING MODULE

The organization of the immersive, mentorship-based training module, as illustrated in Figure 1, was designed by a Project Organizing Committee (POC) formed by the ILAE-NBC education working group (MdC, DH, PJ, NC, JJ, HP, LR, RU, EvV), with the aid of ILAE Research and Innovation Task Force members (MA, AI, MG, JEPS, PP, CT, JW) and additional external associates selected to ensure the involvement of countries from the six ILAE Regions. POC members identified Epilepsy Clinical Centers (ECC) in their working town/country, where up to three trainees with a background in neuroscience, genetics, pharmacology, bioengineering, physics, or computer science (defined as both basic and preclinical scientists; see[3]) were enrolled by Local Project Coordinators (LPC) to spend two weeks in the pilot training program. ECCs hosted scientists with an interest in epilepsy research who worked either within the same institute or in another center of the same town. Recruitment was based on personal contacts between clinicians and basic scientists within each center; candidates were not recruited through a public call, and we did not conduct a formal selection process. For Mexico City and São Paulo, two ECCs were involved, whereas elsewhere only one ECC per city participated. Importantly, the training program consisted of practical sessions and lectures delivered in the local official language.

Before starting the training, the recruited candidates completed a structured entry test consisting of

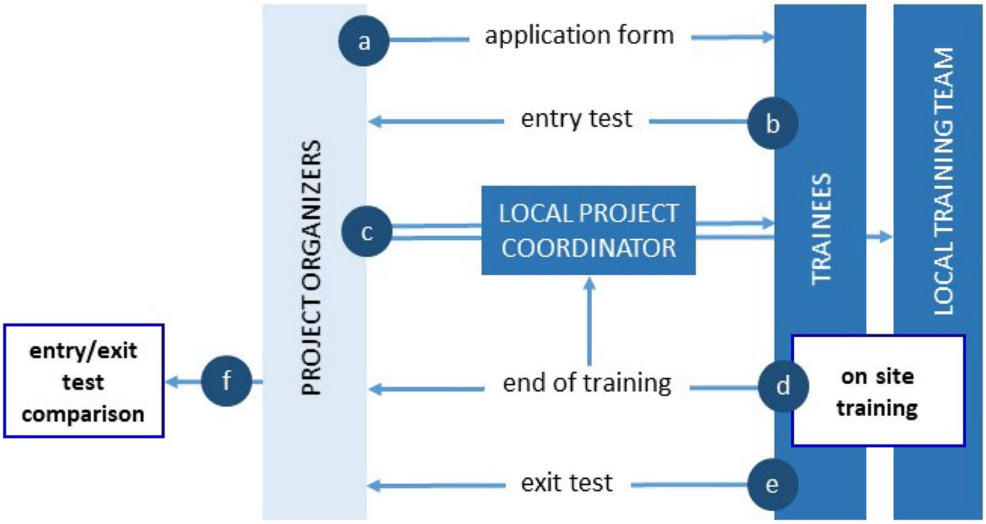

FIGURE 1 On-site training project design. The program workflow is illustrated schematically. The main players are the trainees, the project organizers (PO; aided by an e-learning master), and the local project coordinators (LPC), aided by a local training team. Trainees applied to the program after receiving access credentials from the PO (A). After trainees completed the entry test and sent feedback to the PO (B) and after receiving a selection of 10 readings on epilepsy, PO notified LPC and trainees that the on-site training could begin (C). After the on-site training was completed by all trainees of each center, the LPC notified the PO (D), and trainees sent the PO the compiled exit test (E). At the end of the training, the exit and entry tests were analyzed and compared (F).

17 questions about general clinical epileptology topics written in plain English (Data S1). The questionnaire was developed by a three-stage consultation process across POC members. The same list of questions was included in the exit test completed by the trainees after the on-site clinical training. The application form and the entry/exit tests were made available on a dedicated e-learning platform to collect and analyze trainee biographical data and to evaluate the increase in their clinical epilepsy knowledge (see below). The trainees were not prepared for the entry test, which was designed to reflect their baseline knowledge in clinical epileptology issues. The difference between exit and entry test responses was analyzed and quantified (see below) to measure the effectiveness of the training.

The contents of the training module and of the entry/exit tests were extensively discussed and agreed upon within the POC. The pilot project was launched on May 1st, 2025. Trainees were contacted by email to receive the credentials to access the e-learning platform, where both the application form and the entry test were made available (*a* in Figure 1). Upon completion of the entry test (b), all trainees received a confirmation message and a link to 10 review articles on clinical epilepsy topics selected by the POC,[4–13] and both LPC and trainees were authorized to start the training activity (c). Project enrolment (i.e., completion of all entry tests) was concluded by the second week of July 2025; with the exception of two trainees from one center who closed the training in October, and all other trainees concluded the training by September 15th, 2025. The end of the training was communicated to the program organizers (d) and concluded with the completion of the exit test via the e-learning platform before October 31st, 2025 (e). The entry and exit tests were then analyzed and compared (f in Figure 1; see below). Finally, two questionnaires were sent to all trainees and to the LPCs after the training activity, to gather detailed feedback about the training activities performed at each ECC and the educational process.

3 | PLANNING OF THE ON-SITE TRAINING

Before starting the project, the content of the training activities was discussed within the POC to achieve the five learning objectives mentioned in the Introduction; it was decided that the first on-site training week would be dedicated to general epileptology issues, taught via a mix of methods that varied according to the hosting ECC, and included one-to-one meetings and lectures, participation in handover and clinical case discussion meetings, practical sessions about diagnostic procedures, ward round and outpatient clinic attendance, and journal clubs. The second week focused more specifically on a selected aspect of care that represented a clinical epilepsy program specific to the hosting ECC, such as epilepsy surgery, genetic or autoimmune phenotyping, and transition programs.

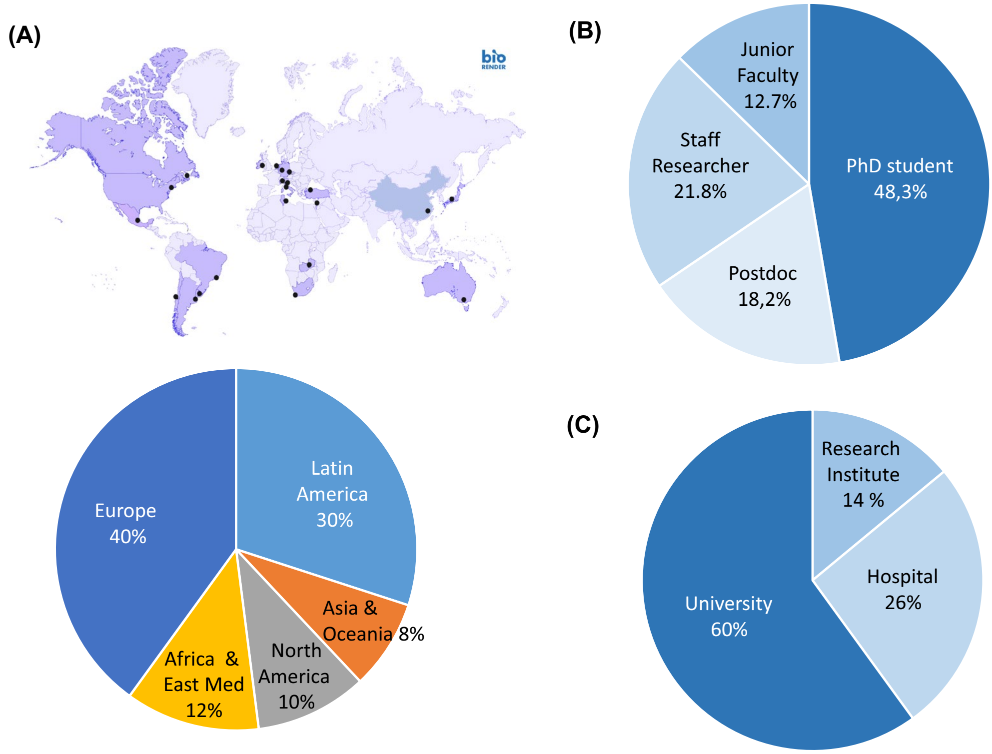

FIGURE 2 Epilepsy Clinical Centers and trainee demographics. (A) Geographical distribution of the countries hosting the pilot training program; the dots identify the location of the Epilepsy Centers engaged in the training (Amsterdam, Beijing, Bologna, Bonn, Buenos Aires, Cape Town, Dublin, Firenze, Halifax, Istanbul, Lusaka, Melbourne, Mexico City, Milano, Montevideo, New York, Prague, Santiago, Sao Paulo, and Sfax). The intercontinental distribution of the ECC proves the feasibility of the training in different geographical regions. The percentage distribution by continent of the number of trainees is illustrated in the lower pie chart. (B) Percentage distribution of the trainees' working positions. (C) Working environments of the trainees.

4 | RECRUITMENT OF LPCs, ECCs, AND TRAINEES

Twenty-one ECCs across 18 countries (Figure 2A) hosted the pilot training. One LPC was identified by the POC in each of the cities/countries involved in the pilot training, and one or more local tutors were identified in each ECC by each LPC. Of the 21 LPCs (9 females, 12 males), 14 had a clinical background, and 11 were senior neuroscientists (4 had both basic and clinical competence); all other tutors selected by the LPCs in each ECC were required to be expert epilepsy clinicians.

The demographics and professional status of the 55 enrolled basic scientists participating in the project were collected from the application forms and are detailed in Figure 2A–C. Of these 55 candidates, 50 (30 female) completed the training. Three trainees were locally trained in African countries (one in South Africa and two in Zambia), three in an East Mediterranean country (Tunisia), two in Asia (both in China), 20 in Europe (three in Czech Republic, two in Germany, three in Ireland, eight in Italy, two in the Netherlands, and two in Turkey), five in North America (two in United States of America and three in Canada), two in Oceania (both in Australia), and 15 in Latin America (two in Argentina, five in Brazil, two in Chile, four in Mexico, and two in Uruguay; lower panel in Figure 2A). Twenty-three trainees lived and were exposed to clinical practices in ECCs from low–middle-income countries and 27 trainees worked and attended high-income countries' ECCs (defined according to https://www.ilae.org/files/dmfile/countries-list---world-bank---4-december-2025.pdf). About half of the trainees (48.3%) were PhD students, 18.2% were postdoctoral fellows, 21.8% were staff researchers, and 12.7% were junior faculty (Figure 2B). The trainees worked either in universities (60% of cases), or hospitals (26%), or research institutes (14%; Figure 2C). The large majority of trainees (86.3%) declared that they had no clinical background, and 61.8% had little knowledge of clinical epilepsy. Despite their limited clinical knowledge, 56.4% of the applicants had already collaborated with clinical epileptologists for research purposes.

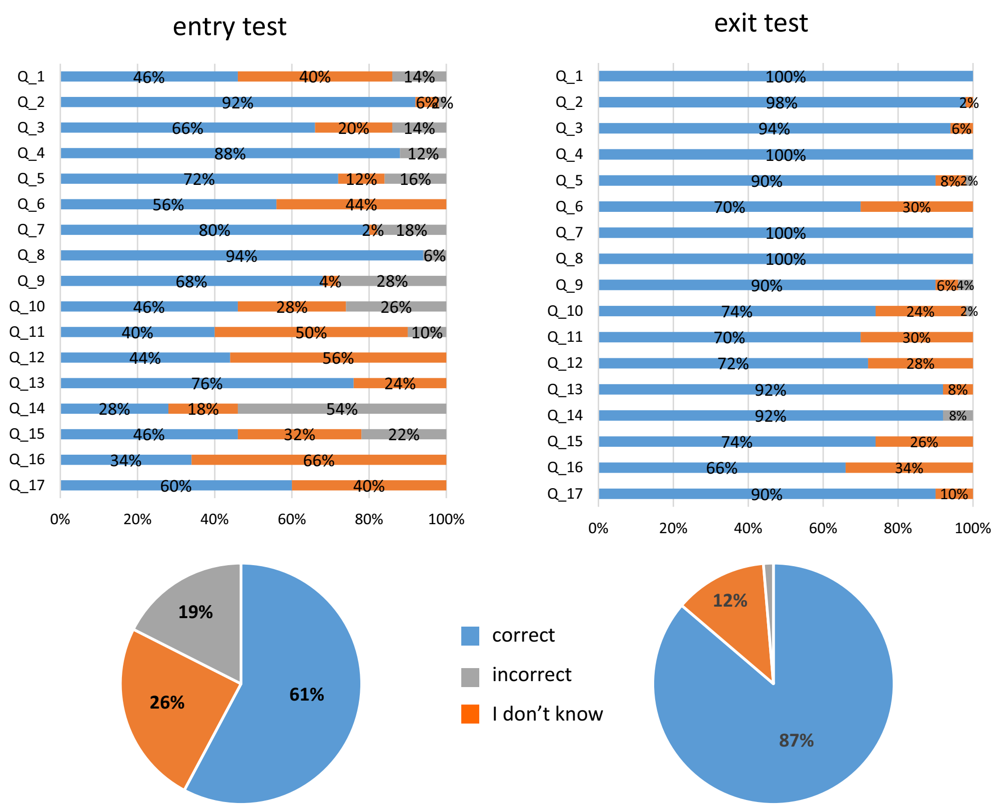

FIGURE 3 Responses of the basic scientists to the same set of 17 questions (Q1 to Q17; Data S1) on clinical epilepsy issues before (entry test; left graphs) and after the on-site training (exit test; right graphs). In the upper panels, the percentage distribution of incorrect (in red), correct (in blue), and doubtful ("*I don't know*" responses, in gray) responses for each of the 17 questions is shown. Overall percentage distribution of the correct, incorrect, and doubtful responses in the entry and exit tests.

5 | OUTPUT OF THE TRAINING ACTIVITY

The output of the training activities was assessed by analyzing the results of the entry and exit tests designed on the dedicated e-learning platform. For the analysis, continuous variables were summarized by means ± standard deviations, while categorical variables were described using frequencies and percentages of occurrence. The entry and exit tests consisted of 17 multiple-choice questions that assessed both knowledge-based items and trainees' self-perception of knowledge (Data S1). Two questions using a 5-point Likert scale were reduced to a 3-item scale for simplification. Initial comparison of pre- and post-training response scores was descriptive and evaluated the average percentages of correct and incorrect answers before and after training. Inferential analysis on knowledge differences was performed using McNemar's Test applied per item. For this dichotomous analysis, both 'I don't know' and incorrect answers were grouped as incorrect. The level of statistical significance was set at $p < 0.05$. When we invited participants, we specified that we intended to assess the skills acquired after the training with a final test, but we did not mention that the test questions would be the same.

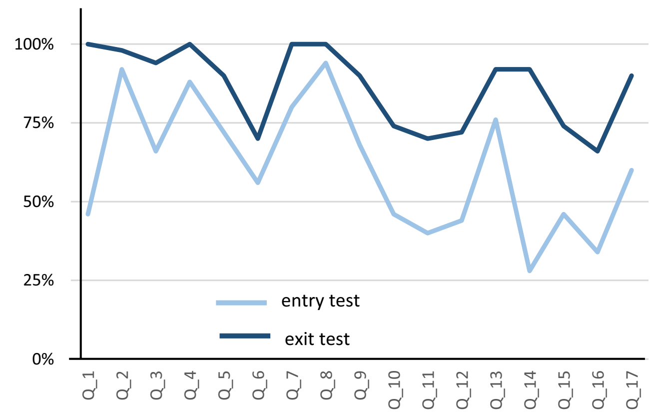

FIGURE 4 Direct comparison between the overall percentage of Q1–Q17 responses in the entry (light blue line) and exit test (dark blue line). A clear gain in knowledge is demonstrated across all the different topics explored by the questionnaire.

Of the 55 recruited scientists, five were excluded from the final analysis due either to incomplete training and/or to ECC administrative or organizational impediments.

The mean number of trainees who completed training at each site was 2.5 ± 0.9 (mean ± SD; range 2–5), while the number of applicants for each training program averaged 3.5 ± 1.6 (mean ± SD; range 1–6) in different ECCs. Data in the lower panels of Figure 3 illustrate the overall percentage differences between pre- and post-training evaluations. The average changes in responses before and after the training ($n = 50$) are detailed in the upper Figure 3 panels. The average response distribution for each question is illustrated in Figure 4 for the entry (light blue line) and the exit tests (dark blue line). The graph illustrates a general increase in knowledge following training, with some questions exhibiting greater gains.

The training activities carried out in each ECC were collected post-hoc through a questionnaire sent to all LPCs after the conclusion of the training and after all trainees of all ECCs completed the exit test. The practical activities in the clinic and the lectures on clinical epilepsy topics offered during the training period are illustrated in the left and right columns of Table 1, where the percentage distribution of the activities among ECCs is also indicated. In some ECCs, the following additional specific topics were also addressed during the second week of on-site training: how to plan a stereo-EEG implantation (seven ECCs), sleep disorders (one ECC), genetic assessment (three ECCs), magnetoencephalographic evaluation (one ECC), and discussion of preclinical research strategies (three ECCs). The following practical activities were also offered during the second week: attendance in the operating room during epilepsy surgery (four ECCs), attending the neurogenetic laboratory (two ECCs), and neuropathology case discussions (four ECCs). These activities were selected according to the specific clinical procedures and programs available in each ECC.

By investigating the total exposure time across centers, we observed a bimodal distribution with 40 h representing the median exposure. Mann–Whitney U test revealed that trainees with high exposure (>40 h) achieved a significantly better performance gain compared to those receiving <40 h exposure (mean gain 5.23 vs 2.48; $p = 0.041$). Spearman correlation analysis across the continuous spectrum of hours was not significant ($rho = 0.233$, $p = 0.107$), suggesting a non-linear dose–response curve. Next, we analyzed the impact of both practical sessions and theoretical lectures on learning. No significant differences in performance gain were found based on the number of lectures ($p = 0.832$) or total (practical + lecture) activities ($p = 0.591$).

As illustrated in Table 2, the official clinical tutors assigned by the LPCs in each ECC were 42 (22 females and 20 males, LPC included; all co-authors of the present report; mean of 2.1 ± 0.94 SD per ECC), delivered tutoring tailored to the basic scientists. In addition to the above tutors, an average of 6.8 ± 3.6 staff clinicians per ECC (range from 0 to 12; total of 125 for the entire project) contributed as tutor assistants to the training program activities, with 40.8 ± 20.4 dedicated hours per ECC (range between 17.5 and 80 h). The total time spent by the trainee in each ECC was, on average, 50.3 ± 23.3 h, with a range of 16–89 h.

TABLE 1 Practical clinical activities (left) and clinical lectures (right) performed during the training in the 21 ECCs. In the middle and right columns of each table, the number (n) and percentage (%) of ECCs that performed the specific training activity are listed.

Practical activities	***n***	**%**
Inpatient clinical ward	21	100,0
Clinical handover meetings	20	95,2
Case discussion	21	100,0
Video-EEG monitoring	21	100,0
EEG interpretation	20	95,2
Outpatient clinic	17	81,0
EEG outpatient	15	71,4
Neuroimaging	13	61,9
Journal clubs	11	52,4
Patient need session	6	28,6
Lectures on	***n***	***%***
Clinical procedures	16	76,2
Classifications and etiologies	17	81,0
Pediatric epilepsies	10	47,6
Clinical trials	4	19,0
Status epilepticus	6	28,6
Cognitive assessment	9	42,9
Drug therapies	16	76,2
Surgical therapies	17	81,0
Tissue/neuropathology	8	38,1
Presurgical assessment	16	76,2
Dysimmune epilepsies	4	19,0

6 | POST-TRAINING SATISFACTION QUESTIONNAIRES

The e-learning platform exit test prepared for the trainees included six additional open-ended questions to gauge the satisfaction of the trainees with the training program. The program received positive feedback across all measured domains. Satisfaction levels were high: 92% of trainees reported the activity met their expectations, and 90% agreed that the format was satisfactory. The perceived impact of the training on future work was strong, with 96% of participants trusting that the concepts they learned would

TABLE 2 Human resources involvement and training times: Average values and ranges calculated from the post-training questionnaire sent to LPC of the 21 ECCs (Data S2).

	Number	Average ± SD	Range
Tutors	42	2.1 ± 0.94	1–3
Tutor Assistants	125	6.8 ± 3.57	0–12
Trainees	50	2.5 ± 0.88	2–5
		Average ± SD (h)	**Range (h)**
Trainee training time		50.3 ± 23.32	16–89
Tutoring time		40.8 ± 20.45	17.5–80

influence their future research, both in how it would be planned and in the experimental practices. Tutors received high praise for their efforts, with a 96% agreement that the mentors were motivated to share their clinical knowledge. As a result, 98% of trainees would recommend the training, and 96% plan to stay in contact and collaborate with the hosting clinicians. The open comments made by the trainees highlighted the motivation and skills of the clinical tutors, the program's multidisciplinary and collaborative nature, and its value for networking opportunities. Moreover, the practical training was perceived as useful, with the two-week format effectively addressing the gap between basic science and clinical epileptology. The feedback provided by trainees predominantly highlighted three areas for program enhancement and improvement: extending the duration of practical sessions, providing more learning materials, and improving the practical organization of the training schedule.

In parallel with the opinions of trainees, comments on the training program and future perspectives were also collected from tutors and were conveyed in a single document by each LPC. A 19-item questionnaire on the type of training (administered via an on-line surveying service; Data S2) was sent to the 21 LPCs after the training was completed. The first set of questions (Q1 to Q5; see also above) collected data on the interest and participation of basic scientists, recording the number of requests to become a trainee as well as the actual number of basic scientists enrolled in and completing the training. Questions 6 and 7 explored the format of the training, and questions 8 to 11 investigated the critical issues experienced during the training activity. Another set of questions (12–19) inquired about the possible changes proposed for future editions of the on-site training program.

LPCs' feedback reported overall a high satisfaction with the training format and content. Most LPCs (75%, $n=15$) considered the training duration 'about right,' whereas a few felt it was 'too little time' (10%, $n=2$) or 'too long a commitment' (15%, $n=3$). Regarding the format, tutors reported the two-week training was delivered either consecutively (35%) or with more than a month between sessions (35%), while 30% used a non-consecutive schedule for both weeks of tutoring. Nearly all tutors (90%) reported no issues in organizing sessions before and during training, with four ECCs facing administrative or collegial challenges. No problems were identified regarding the interaction and collaborative intent of ECC tutors. Overall, 80% rated the experience as 'extremely positive,' while 20% deemed it 'positive.' All tutors expressed willingness to repeat the training between 1 and 4 times per year, for a median of 4 basic science trainees annually (range 2–8). Only 15% would recommend a one-week program, whereas 85% favored a two-week period (either consecutive or non-consecutive). Some tutors proposed a structured program involving several nearby ECCs, in order to maintain momentum and share the organizational burden. All LPCs agreed to recommend that other ECCs adopt this training module format. In the open question section and during discussion sessions of the OPC, most tutors enjoyed the reciprocal interaction with basic scientists and appreciated the exposure to a different perspective that fostered discussion beyond ordinary schemes on critical epilepsy issues.

Based on the feedback of tutors, challenges to the program were related to trainee study commitments and organizational logistics; these often required flexible, non-consecutive schedules and the arrangement of honorary appointments for trainees. To address these structural obstacles and ensure long-term success, tutors strongly recommended shifting from a single-center model to a structured, collaborative program involving multiple epilepsy centers. Future improvements, based on trainee feedback, may focus on increasing the number of practical sessions and ensuring greater alignment between the program structure and the educational materials.

7 | CONCLUSIONS

We report the establishment and global testing of an on-site training in clinical epilepsy specifically designed for non-clinician scientists. The training program achieved the predefined set of learning objectives, and the participants gained new knowledge and understanding of clinical and patient-related issues over a relatively short period of time. Intrinsic limitations of the pilot test are the short-term assessment of knowledge, the self-selection of motivated trainees, and the relative heterogeneity of training delivery in different ECCs. It has to be clarified that the term *clinical training* does not mean that basic scientists were fully trained in clinical epileptology; during the two weeks, they received a brief introductory exposure to clinical epileptology.

The enthusiastic feedback from both trainees and tutors expressed after the training demonstrated that intensive interactions were established with mutual benefit. Clinical tutors acknowledged having benefitted from this pilot program and appreciated the basic scientist's perspective to open issues derived from the exposure to clinical procedures. Moreover, the training format strengthened professional relationships between preclinical/basic scientists and clinical scientists. The results support this training format as a blueprint for future global educational initiatives. Based on this pilot experience, the educational task force of the ILAE-NBC has plans to expand this type of training beyond this pilot test by implementing and coordinating a local, on-site, ILAE-Chapter-based training module. Key performance indicators, such as joint collaborative studies, publications, and grant applications, could be monitored over the years following the on-site training to verify whether this educational activity created conditions conducive to future long-standing research collaborations. Nonetheless, the upskilling of basic scientists in clinical epileptology will enable clinically meaningful research questions to be the focus of their endeavors.

Most importantly for the ILAE mission, the broad ILAE regional distribution of the involved ECCs shows that the proposed on-site clinical training is feasible in different geographical regions, irrespective of whether they are low-, medium-, or high-income countries. This pilot project demonstrates the geographic distribution of ECC within *active* ILAE Chapters, which are ready to nurture clinical training programs tailored to local demand by neuroscientists. This impression, based on the pilot recruitment of 21 ECCs, will be verified in the future by increasing the number of ILAE Chapters called to join this type of training program. We started a new project under the supervision of the ILAE Neurobiology Commission that plans to evaluate key performance indicators over a long period (ideally 3–5 years) after the training activity. Future educational initiatives may depend on local resources, tutor availability, and institutional support, all factors that could further strengthen the real-world perspective and impact of the training.

Finally, the reciprocal need for clinicians to receive training in basic and preclinical neuroscience, representing the other essential dimension of translational research, emerged during the pilot project and could be addressed. Accordingly, a future objective of the ILAE Neurobiology Commission is to support the implementation of the existing ILAE Academy competency-based curriculum, including dedicated neurobiology modules for clinicians.

AUTHOR CONTRIBUTIONS

AI, CT, DH, EC, EvV, GB, HP, JNG, JEPS, JW, LR, MA, MdC, MG, NC, PB, PJ, PP, ADR, and SdC contributed to the design of the training activity module within the Project Organizing Committee (POC); AF, AI, AJB, CT, DH, EvV, HS, JEPS, JW, LF, LR, MA, PB, PJ, PP, RU, SB, SK, and YW were identified as Local Project Coordinators (LPC) and contributed to trainee tutoring; BG, BW, CB, CO, DF, DK, EA, EMY, FB, GA-C, GB, IBA, IES, IM-J, KV, LM, ML, MU, ND, NM, NM, PP, RH, RS, SK, SO, TB, VK, and YL were designated as clinical tutors in the hosting clinical centers. MdC, BG, and SdC analyzed the data and drafted a first complete version of the manuscript that was reviewed by PJ and DH and was integrated with the comments of all other Authors.

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CONFLICTS OF INTEREST STATEMENT

None of the authors has any conflict of interest to disclose. We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

DATA AVAILABILITY STATEMENT

Data are available upon request at the *Carlo Besta* Neurological Institute data repository.

ETHICS STATEMENT

This *special educational report related to experimental and translational work* was written by experts selected by the Neurobiology Commission of the International League Against Epilepsy (ILAE) and was approved for publication by the ILAE. Opinions expressed by the authors, however, do not necessarily represent the policy or position of the ILAE.

SOCIAL MEDIA AND ARTICLE PROMOTION

This is a pilot of an upcoming larger educational project under the auspices of the ILAE Neurobiology Commission.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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