European Network on Myalgic Encephalomyelitis/Chronic Fatigue Syndrome
COST Action - CA15111

Deliverable 6

Description and programme book of training schools and training events (renewed annually)

One of the main tasks of WG5 is to organize two training schools: "Summer school on -omics and bioinformatics in ME/CFS research", and "Summer school for translational research in ME/CFS". First training school "OMICS TECHNOLOGIES AND BIOINFORMATICS APPLICATIONS IN ME/CFS RESEARCH" was organized and conducted during GP2. Second training school is in the process of organization and will be conducted during GP3.

FIRST TRAINING SCHOOL

"OMICS TECHNOLOGIES AND BIOINFORMATICS APPLICATIONS IN ME/CFS RESEARCH"

Description

Organizer: UNIVERSITÀDEGLI STUDI DI PAVIA, Pavia (Italy), Prof Enrica Capelli and Dr Lorenzo Lorusso

Venue address: Residenza Universitaria Biomedica Collegio S.Caterina, Via L. Giulotto, 12, Pavia, 27100, Italia

Dates: July, 17-22 (2017)

Purpose of training school: Disseminating knowledge on the latest generation technologies to increase the skills of Early Career Investigators (ECI) involved in ME/CFS research for biomarker discovery.

Topics included in the training:

- Next generation technologies
- miRNA identification and quantitation
- Microbiota characterization
- Bioinformatics

Theoretical and practical sessions

Trainers:

Laboratory methods: Enrica Capelli (Italy), Simona Panelli (Italy)

Bioinformatics and Statistics: Laura Baldo (Spain), Simone Marini (Italy), Simona Panelli (Italy)

Maximum number of trainees to be accepted for reimbursement according to the EUROMENE plan: 12

Important dates

MAY 19: call for the Training School published on the EUROMENE web-site
JUNE 10: Deadline for applications
JUNE 15: Selection results
JULY 17-22: Training school in Pavia

Selection procedure

Eligibility criteria:

- Trainees from COST Full Members/COST Cooperating Member, from approved NNC institutions; from approved European RTD Organizations
- Early Career Investigators (PhD students, PhD + 5 years)
- Knowledge on basic molecular methods
- Preference to scientists working in the field of ME/CFS, but others are not excluded

How to apply: Send a CV and a motivation letter to the Scientific Committee

e-mail: euromenetrainingschool@gmail.com

- **Scientific Committee:** Enrica Capelli; Lorenzo Lorusso; Evelina Shikova; Modra Murovska; Carmen Scheibenbogen
- **Applicants by country**

Country	Number of applicants
Latvia	4
Spain	3
Italy	2
Germany	2
Romania	2
Belarus	1
Bulgaria	1
All	15

Approval from the COST Office to accept all 15 applicants/Total expenditures for grants of all 15 trainees (12254 euro) fit within the planned sum for trainees

Conclusions

- Efficient instrument for disseminating knowledge to increase capacity of ME/CFS research by involving Early Carrier Investigators (ECI), including from new EU member states
- High interest from ECIs site in this activity (15/12)
- Almost 47% (7/15) involvement of ECIs from the new EU member states

FIRST TRAINING SCHOOL

"OMICS TECHNOLOGIES AND BIOINFORMATICS APPLICATIONS IN ME/CFS RESEARCH"

Programme

Monday 17 July 2017: Introduction to the training school:

10:30 Welcome Roberta Ardino - President of the "Associazione Malati di CFS/AMCFS-Onlus"

11:00 Participants' presentations

12:00 Lack of specific biomarkers and the consequences in diagnostics: the case of ME/CFS

Dr. Lorenzo Lorusso: Pitfalls in diagnostic procedure for CFS

13:00 Lunch

14:30 Prof. Enrica Capelli/Dr. Lorenzo Lorusso: which biomarkers for CFS?

I.microRNA

II.microbial dysbioisis

16:00-17:00 Discussion

Tuesday 18 July 2017: gene expression and miRNA

9:00 Prof. Enrica Capelli: Micro RNA sequencing and quantitation: which samples, which technological approaches?

11:00 Laboratory practical activities: RNA extraction (sample, methods, yields, quality check, sequencing flow chart)

13:00 Lunch

14:30-17:30 Dr. Simone Marini: Bioinformatics of miRNA sequence data

I. miRNA annotation

II. Identification of new miRNA

III. Statistical evaluation

IV.

Wednesday 19 July 2017: analysis of miRNAs

9:00 miRNA Laboratory practice activities: miRNA expression tests (type of tests, technologies…)

11:00 Discussion

13:00 Lunch

14:30 Laboratory practice activities: miRNA in biological fluids

16:00 Discussion

Thursday 20 July 2017: analysis of miRNAs

9:00 Prof. Enrica Capelli/Dr. Valeria D'Argenio: miRNA libraries and sequencing procedures

11:00 Prof. Enrica Capelli: DNA extraction (type of sample, technologies, strategies, metagenomics approaches)

13:00 Lunch

14:30-17:30. Microbiota and CFS

Laboratory practice activities: metagenomics approaches to characterize microbial communities

I.16s amplicon

II.ITS 1 amplicon

Friday 21 July 2017

9:00 Dr Simona Panelli: Microbial identification by culture independent methods

II. disbyosis of bacteriome and pathological consequences

11:00 Prof Laura Baldo: Bioinformatics after amplicon sequencing

12:00 Lunch

14:30 Dr. Simona Panelli: Mycome characterization (principles and strategies)

16.00 Prof. Laura Baldo: Statistical analysis of metagenomic data

Saturday 22 July 2017

9:00 Prof. Enrica Capelli/ Lorenzo Lorusso: Biomarkers for ME/CFS:

Designing researches for biomarkers discovery using micro-RNA and/or microbial composition (each participant)

11:00 Evaluations and Discussion

12:00 Lunch

14:30 Prof. Enrica Capelli/ Dr. Lorenzo Lorusso. Conclusive remarks.

Evaluation Questioners - Summary

- **Innovation**: only 2 students have attended previously similar courses
- **Relevance** for ME/CFS research:

  14: relevant (6 excellent; 8 good; 1 poor)
- **Logistic**/facility

  12: satisfaction (6 excellent; 6 good; 3 poor)
- **Most appreciated (usefull) topics:**

  11: new methods/new information (5: bioinformatics; 4: metagenomics/ microbiota; 2: miRNAs)

  3: exchanging/share experiences

  1: pitfalls in ME/CFS research
- **Comments**

  General: N. 2

  1: everything is excellent

  1: slides difficult to read

  Comments/suggestions: N. 10

  3: more informatic modules with practical sessions

  2: more practice (analysis of miRNAs)

  1: improve the course with the shot-gun sequencing method

  1: modules too general and topics not related

  1: prepare program in time

  1: more lecturers with experience in ME/CFS

  1: more training school like that and with more practice