Report on the Activities of the ECFS Basic Science Working Group (BSWG)

Annual Report – May 2020

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1. Goals

The ECFS BSWG – Basic Science WG (renewal approved in January 2018) has the following goals:

1) Widening the number of European scientists (as ECFS members) doing fundamental research related to CF, in particular the BSWG aims to attract, train and maintain younger investigators in the CF field;
2) Promote best practice procedures (through organization of workshops);
3) Develop a network (jointly with ECFS-TDN and Registry) for the creation of biobanks of CF patients' materials across Europe for the generation (e.g., primary cultures of epithelial cells, intestinal organoids, etc) and distribution of resources for CF research;
4) Production of consensus guidelines for standardization of research-derived laboratory techniques that can be applied to the clinic (e.g., novel biomarkers to be used in CF diagnosis or as "surrogate endpoints" for clinical trials, etc);
5) Prioritizing topics related to emergent needs in the field so as to create "task forces" (e.g., on assays to measure CFTR activity, drug discovery, etc);
6) Promotion of excellence in CF research by fostering European-scale research to avoid effort duplication at national level and fragmentation and to achieve competitiveness for EU consortia
7) Liaising with basic scientists in other societies (European Respiratory Society; United European Gastroenterology, UK Physiological Society) and patients associations (CFF-USA; Mukoviszidose e.V, CF Trust, Vaincre la Mucoviscidose, etc) to maximize and optimize efforts.

2. Activities

2.1. Annual meeting of the BSWG

The BSWG aimed to organize a session within the 17th ECFS Basic Science Conference in Albufeira, Portugal, 25-28 March 2020, which would have taken place on Thursday, 26 March (18:00 - 19:45). However, due to the Covid-19 pandemic, the 17th ECFS Basic Science Conference did not take place and neither did this BSWG session.

Meanwhile, the report on the BSWG symposium that took place on 28 March 2019 at the 16th ECFS Basic Science Conference in Dubrovnik, Croatia, 27-30 March 2019, was published in JCF:

- Amaral MD, Beekman JM (2020) *Activating Alternative Chloride Channels to Treat CF: Friends or Foes?* Report on the Meeting of the Basic Science Working Group in Dubrovnik, Croatia. *J Cyst Fibros* **19**: 11-15. [PMID: 31676346]. DOI: 10.1016/j.jcf.2019.10.005

2.2. BSWG Workshop

Still within the past year, the BSWG organized the "*Summer School on Epithelial Systems: Physiology and Pathophysiology*[1]" (ESP2019), that took place between 22 – 26 July 2019, at the Faculty of Sciences of the University of Lisboa (FCUL), Portugal, (see Poster in Annex 1).

This workshop aimed to elucidate researchers from the CF community on the theoretical aspects of basic CF science, as well as providing practical training in the new techniques underlying current and novel biomarkers based on CFTR activity and other molecular and cell biology parameters (see detailed programme in Annex 2).

The Workshop was open to 20 participants, and we enrolled participants from (see list of participants in Appendix 3): Brazil (1), France (2), Germany (4), Israel (1), Italy (3), Poland (2), Portugal (1), Sweden (3), Switzerland (1), UK (1+1 Northern Ireland).

The Workshop counted with the support of National Patients Organizations in the form of travel grants for participants from the respective countries: Germany (4) and Belgium (2).

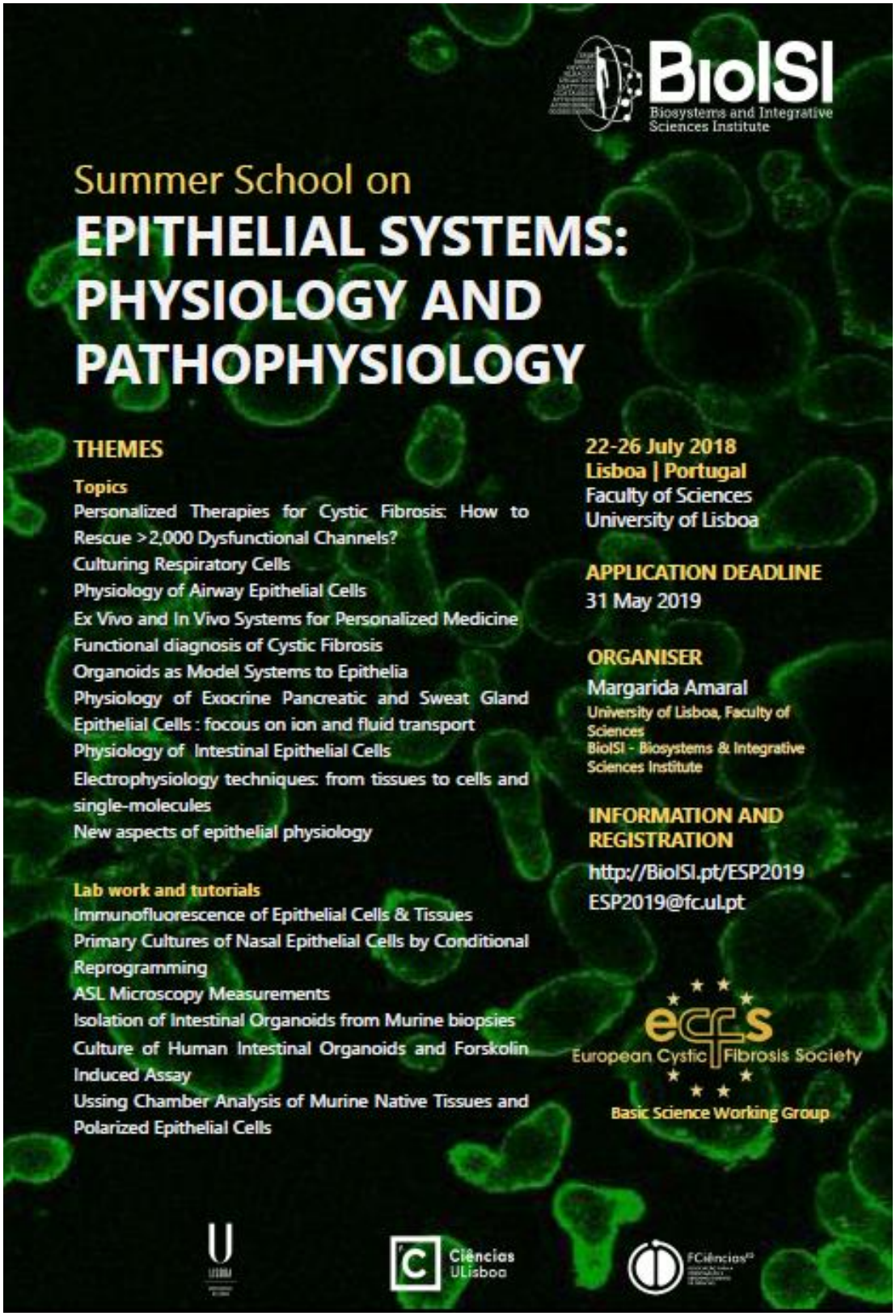
Based on the very positive evaluations of the BSWG ESP 2019 Workshop (see evaluation by participants in Annex 4), it was decided to organize again at FCUL, Lisboa (Portugal) in 2020 the 5th "*2020 Summer School on Epithelial Systems: Physiology and Pathophysiology*" to take place in Lisboa, 27 – 31 July 2020.

However, in March 2020, we took the decision of not organizing the 2020 Summer School as planned due to the Covid-19 pandemic. We considered that although in July 2020 the situation could have cleared, it was still unclear in March whether it will be possible to organize face-to-face events in July. Moreover, for participants the decision to attend would need to be taken by April when there is still great uncertainty regarding travel.

Due to the fact that the BSWG initiatives for 2020 could not take place due to the pandemic (and accordingly, the 2020 budget was not spent), we propose to the ECFS Board to extend the duration for another year, i.e., for a total of 4 years.

[1] Previously called "*Hands-on Workshop on Epithelial Systems: Physiology and Pathophysiology*"

Annex 1 – Poster announcing the "*2019 Summer School on Epithelial Systems: Physiology and Pathophysiology*"



Annex 2 – Programme of the "*2019 Summer School on Epithelial Systems: Physiology and Pathophysiology*"

EPITHELIAL SYSTEMS: PHYSIOLOGY AND PATHOPHYSIOLOGY

Lisboa, Faculty of Sciences, 22-26 July 2019

Time	Monday (22 Jul)	Tuesday (23 Jul)	Wednesday (24 Jul)	Thursday (25 Jul)	Friday (26 Jul)	Time
8.30-9.00	Registration					
9.00-9.30	Course Introduction	Lecture 03 - Physiology of the Airway Epithelial Cells RT	Lecture 05 - Functional diagnosis of Cystic Fibrosis MH	Lecture 07 - Physiol. of Pancreatic and Sweat Gland Epithelial Cells MG	Lecture 09 - Electrophysiology techniques	9.00-9.30
9.30-10.00	Lecture 01 - Personalized Therapies for Cystic Fibrosis MDA					9.30-10.00
10.00-10.30		Coffee Break	Coffee Break	Coffee Break	Coffee Break	10.00-10.30
10.30-11.00	Lecture 02 - Culturing Respiratory Cells AK	Lecture 04 - *ExVivo* and *InVivo Systems for P*ersonalized Medicine MDA	Lecture 06 - Organoids as Model Systems to Epithelia JB	Lecture 08 - Physiology of Intestinal Epithelial Cells KK	Lecture 10 - New aspects of epithelial physiology KK	10.30-11.00
11.00-11.30						11.00-11.30
11.30-12.00	Coffee Break	Break	Break	Break	Break	11.30-12.00
12.00-12.30	Research Seminar 1 AK	Research Seminar 2 RT	Research Seminar 3 KK	Research Seminar 4 JB	Research Seminar 5 MG	12.00-12.30
12.30-13.00						12.30-13.00
13.00-13.30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	13.00-13.30
13.30-14.00						13.30-14.00
14.00-14.30	Lab 01 - Immuno MQ	Lab 03 - ASL RT	Lab 05 Swelling Assay IS & AV?	Lab 06 Ussing Chamber MH	Tutorial 01 - Organoids JB, IS & HB	14.00-14.30
14.30-15.00						14.30-15.00
15.00-15.30						15.00-15.30
15.30-16.00	Lab 02 - Nasal cells AK	Lab 04 - Organoids IS & AV?				15.30-1600
16.00-16.30					Coffee Break	16.00-16.30
16.30-17.00					Tutorial 02 - Ussing Chamber MH & MG	16.30-17.00
17.00-17.30	Coffee Break	Coffee Break	Coffee Break	Coffee Break		17.00-17.30
17.30-18.00	Meet the Expert 1 (Nasal Cells) - AK,RT	Meet the Expert 2 (ASL) - RT, AK	Meet the Expert 3 (Alternative Cl Channels) - KK, MG	Meet the Expert 4 (Organoids) - JB, MDA		17.30-18.00
18.00-18.30						18.00-18.30
18.30-19.00						18.30-19.00
19.00-19.30						19.00-19.30
19.30-20.00					Course Dinner	19.30-20.00

Detailed Programme

Class	Title	Room	Faculty	Institution
Lecture 01	Personalized Therapies for Cystic Fibrosis: How to Rescue >2,000 Dysfunctional Channels?	Lecture room	Margarida Amaral	University of Lisboa (Portugal)
Lecture 02	Culturing Respiratory Cells	Lecture room	Anthony Kicic	University of Western Australia (Australia)
Lecture 03	Physiology of Airway Epithelial Cells	Lecture room	Rob Tarran	University of North Carolina (USA)
Lecture 04	*Ex Vivo* and *In Vivo* Systems for Personalized Medicine	Lecture room	Margarida Amaral	University of Lisboa (Portugal)
Lecture 05	Functional diagnosis of Cystic Fibrosis	Lecture room	Martin Hug	University of Freiburg (Germany)
Lecture 06	Organoids as Model Systems to Epithelia	Lecture room	Jeff Beekman	University of Utrecht (The Netherlands)
Lecture 07	Physiology of Exocrine Pancreatic and Sweat Gland Epithelial Cells : focous on ion and fluid transport	Lecture room	Michael Gray	University of Newcastle (UK)
Lecture 08	Physiology of Intestinal Epithelial Cells	Lecture room	Karl Kunzelmann	University of Regensburg (Germany)
Lecture 08	Electrophysiology techniques: from tissues to cells and single-molecules	Lecture room	Michael Gray	University of Newcastle (UK)
Lecture 10	New aspects of epithelial physiology	Lecture room	Karl Kunzelmann	University of Regensburg (Germany)
Research Seminar 01	TBA	Lecture room	Anthony Kicic	University of Western Australia (Australia)
Research Seminar 02	TBA	Lecture room	Rob Tarran	University of North Carolina (USA)
Research Seminar 03	TBA	Lecture room	Karl Kunzelmann	University of Regensburg (Germany)
Research Seminar 04	TBA	Lecture room	Jeff Beekman	University of Utrecht (The Netherlands)
Research Seminar 05	TBA	Lecture room	Michael Gray	University of Newcastle (UK)
Lab 01	Immunofluorescence of Epithelial Cells & Tissues	Lab 8.1.71	Margarida Quaresma & Hugo Botelho	University of Lisboa (Portugal)
Lab 02	Primary Cultures of Nasal Epithelial Cells by Conditional Reprogramming	Lab 8.1.74	Anthony Kicic & Luka Clarke	University of Western Australia (Australia); University of Lisboa (Portugal)
Lab 03	ASL Microscopy Measurements	Lab 8.1.71	Rob Tarran & Luís Marques	University of North Carolina (USA); University of Lisboa (Portugal)
Lab 04	Isolation of Intestinal Organoids from Murine biopsies	Lab 8.1.74	Íris Silva & Anelotte Vonk	University of Lisboa (Portugal)
Lab 05	Culture of Human Intestinal Organoids and Forskolin Induced Assay	Lab 8.1.74 / 79	Íris Silva & Anelotte Vonk	University of Lisboa (Portugal)
Lab 06	Ussing Chamber Analysis of Murine Native Tissues and Polarized Epithelial Cells	Lab 8.3.43	Martin Hug	University of Freiburg (Germany)
Meet the Expert 1	Nasal Cells	Lecture room	Anthony Kicic & Rob Tarran	University of Western Australia (Australia); University of North Carolina (USA)
Meet the Expert 2	ASL	Lecture room	Anthony Kicic & Rob Tarran	University of Western Australia (Australia); University of North Carolina (USA)
Meet the Expert 3	Alternative Cl- Channels	Lecture room	Karl Kunzelmann & Michael Gray	University of Regensburg (Germany); University of Newcastle (UK)
Meet the Expert 4	Organoids	Lecture room	Jeff Beekman & Margarida Amaral	University of Utrecht (The Netherlands) University of Lisboa (Portugal)
Tutorial 01	Analysis of Organoids Swelling Assay Data	Lecture room	Jeff Beekman, Hugo Botelho & Íris Silva	University of Utrecht (The Netherlands) University of Lisboa (Portugal)
Tutorial 02	Measurement and Analysis of Ussing Chamber Data	Lecture room	Martin Hug & Karl Kunzelmann	University of Freiburg (Germany); University of Regensburg (Germany)

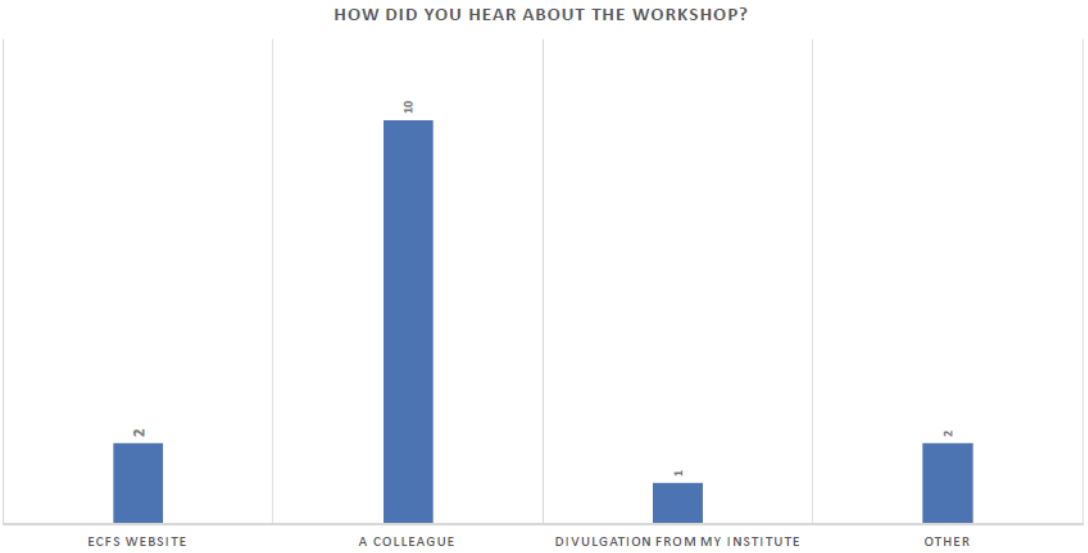
Annex 3 – List of participants at the "*2019 Summer School on Epithelial Systems: Physiology and Pathophysiology*"

List of Participants at the ECFS Summer School on Epithelial Systems: Physiology and Pathophysiology FCUL, Lisboa (Portugal) 22 – 26 July 2019

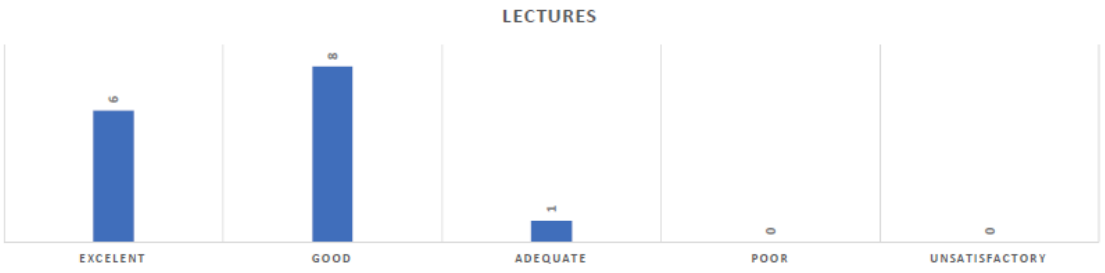
Participant	Institution	Country	E-mail
Agnieszka Leszczyńska	Medical University of Bialystok, 2nd Department of Lung Diseases and Tuberculosis	Poland	agnieszka.leszczynska@umb.edu.pl
Ana Isabel Frias	University of Minho	Portugal	id8209@alunos.uminho.pt
Antony Hoarau	Inserm-P3Cell	France	antony.hoarau@univ-reims.fr
Blandina Esteves	Institute of Virology and Immunology (IVI), University of Bern	Swizterland	blandina.oliveira@vetsuisse.unibe.ch
Dalia Fakih	University of Gothenburg	Sweden	dalia.fakih@medkem.gu.se
Guidone Daniela	Tigem	Italy	d.guidone@tigem.it
Gustavo Gomes da Silva	Faculdade de Ciências Médicas da Santa Casa de São Paulo	Brasil	ggs.ferro@gmail.com
Hanna Schmidt	Ulm University, Institute of General Physiology	Germany	hanna.schmidt@uni-ulm.de
Joana Guerreiro	Centro de Ciências e Tecnologias Nucleares (PT) | German Cancer Research Center (DKFZ)	Germany	joanaguerreiro@ctn.tecnico.ulisboa.pt
Julia Mercier	INSERM - Saint-Antoine Research Center	France	julia_mercier@yahoo.fr
Lisa Douglas	Queen's University Belfast	Northern Ireland, UK	l.douglas@qub.ac.uk
Mahdi Amiri	Department of Gastroenterlogy, Hannover Medical School	Germany	amiri.mahdi@mh-hannover.de
Mark-Christian Jaboreck	Leibniz Research Laboratories for Biotechnology and Artificial Organs (LEBAO) at the Hannover Medical School	Germany	Jaboreck.Mark-Christian@mh-hannover.de
Melania	University of Gothenburg	Sweden	melania.giorgetti@medkem.gu.se
Natalia Pawłowska	Medical University of Bialystok	Poland	natalia.pawlowska@umb.edu.pl
Sachin Sharma	Ariel University	Israel	sachinhcu07@gmail.com
Salsabil Elboraie	Edge Hill University , UK	United Kingdom	Elborais@edgehill.ac.uk
Sofia Jäverfelt	Institution of Biomedicine	Sweden	sofia.javerfelt@medkem.gu.se
Valentina Sala	University of Turin	Italy	valentina.sala@unito.it
Virginia Lotti	Verona University	Italy	virginia.lotti@univr.it

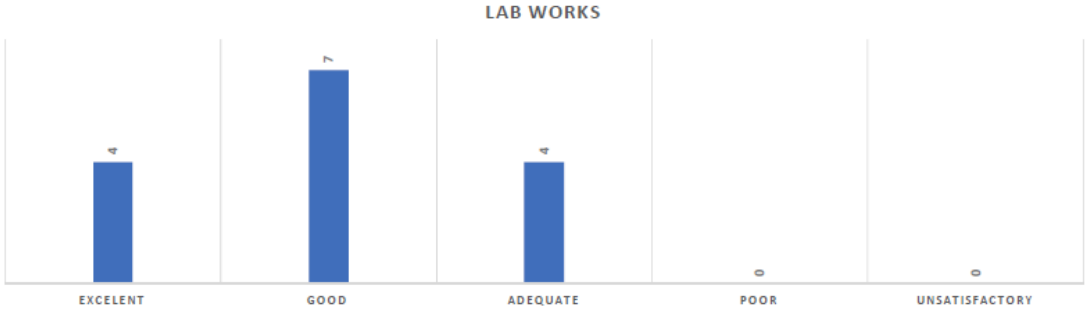
Annex 4 – Evaluation by participants of the "*2019 Summer School on Epithelial Systems: Physiology and Pathophysiology*"

Information on the participants

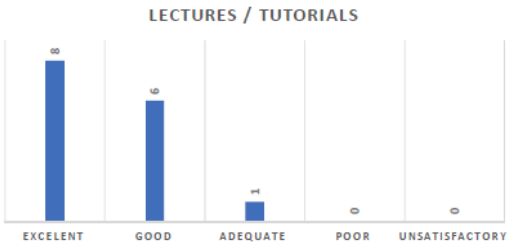


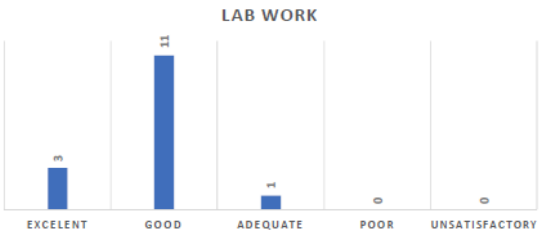
Organization of Programme

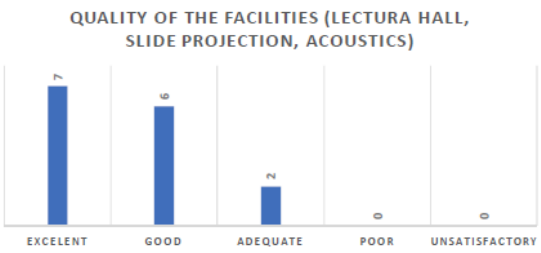




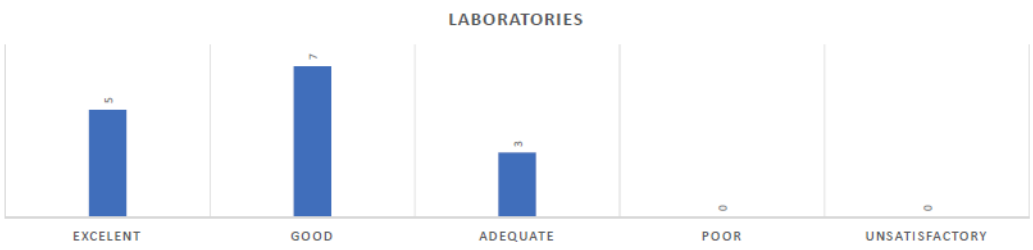
Quality of the programme

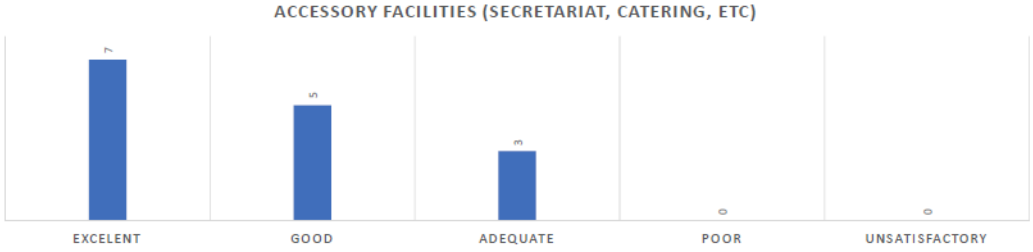




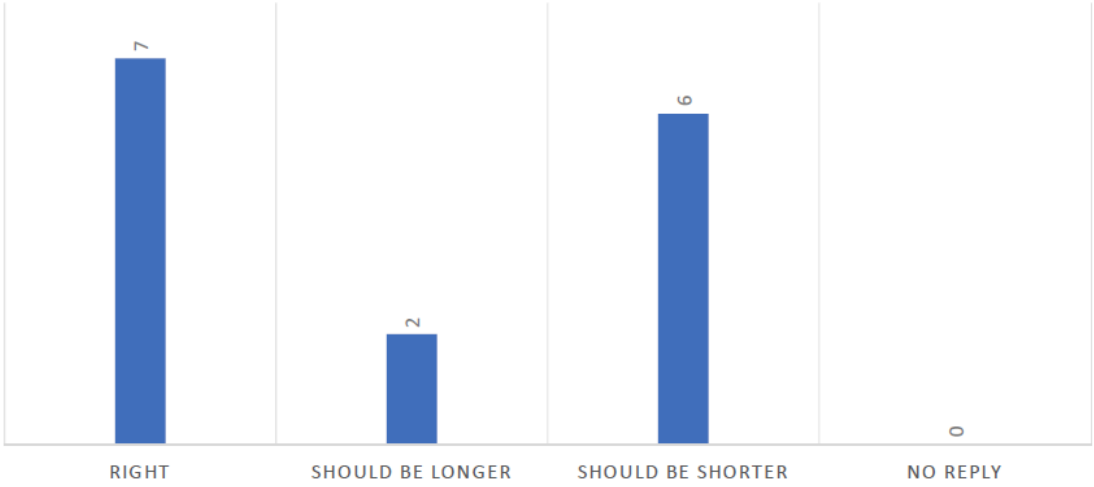


Quality of the facilities





Duration of the workshop



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