EADV-ESDR Summer Research Workshop: Skin Regenerative Medicine

Residents Course | 01-05 July 2024 | Madrid, Spain

Course Description

This workshop offers a comprehensive examination of experimental skin regenerative medicine, emphasizing on cell and gene-based approaches. Participants will gain proficiency in culture and manipulation of skin cells in both 2D and 3D modalities, focusing on preserving stem cell functionality and regenerative capacities. The course addresses the application of these strategies in scenarios such as chronic wounds, large skin losses from trauma, and genetic disorders. Essential wound healing concepts are covered, enabling participants to tackle specific challenges with appropriate therapeutic tools.
The curriculum also delves into advanced skin gene therapy strategies (e.g. genome editing) to address inherited skin defects impairing regeneration. Discussions extend to pre-clinical models and clinical applications, providing a comprehensive understanding of translational aspects in regenerative medicine.
Additionally, the course explores the complexity of cellular populations influencing skin physiology. Participants will learn to analyze and manage large datasets derived from regenerative skin approaches, incorporating artificial intelligence methods. This course offers a thorough exploration of theoretical foundations and practical applications in experimental skin regenerative medicine.

Learning Objectives

1. Skin Cell Culture Mastery:
Attain proficiency in cultivating and managing skin cells in 2D and 3D, emphasizing the preservation of stem cell functionality for effective regenerative applications.

2. Application of Cell-based and other advanced skin Regenerative approaches:
Gain insight on the use of skin regenerative therapies strategically, grounded in a solid understanding of wound healing concepts, to address specific challenges like chronic wounds, traumatic skin losses, and genetic disorders.

3. Advanced Gene Therapy Skills:
Development of competence in advanced skin gene therapy strategies to address inherited skin defects, encompassing both theoretical insights and practical considerations in pre-clinical models and clinical applications.

4. Data Analysis and AI Integration:
Explore the complexity of cellular populations in skin physiology and acquire skills in analyzing large datasets from regenerative skin approaches, incorporating artificial intelligence methods for comprehensive data management and interpretation.

Faculty

Course Chair:	Fernando LARCHER	*CIEMAT-UC3M, Madrid*
Course Co-Chair:	Diego VELASCO	*UC3M, Madrid*
International Speakers:	Sabine WERNER	*ETH, Zurich*
	Michele DE LUCA	*UNIMORE, Modena*
	Christine BALDESCHI	*iSTEM, Evry*
	John CONNELLY	*Queen Mary University, London*
	M. Peter MARINKOVICH	*Stanford University, USA*
	Ulrich KOLLER	*DEBRA Haus, Salzburg*
	Julia REICHELT	*Hamad Medical Corporation, Qatar*
	Clarisse GANIER	*King's College, London*
	Matthias TITEUX	*INSERM, Paris*
	Alexander NYSTROM	*University Freiburg, Freiburg*
Tutors /Local Speakers:	Sara G LLAMES	*CCST, Oviedo*
	Marta GARCÍA	*UC3M, Madrid*
	María J ESCAMEZ	*UC3M, Madrid*
	Paloma PEREZ	*IBV, Valencia*
	Marta CARRETERO	*CIEMAT, Madrid*
	Carlos LEÓN	*UC3M, Madrid*
	Ramón G ESCUDERO	*CIEMAT, Madrid*
	Joaquin DOPAZO	*Fundación Progreso y Saluds, Sevilla*
Assistants:	Blanca DUARTE	
	Angélica CORRAL	

Programme

DAY 1
Monday, 01 July 2024

Keratinocyte Biology and culture (2D)

14.00-14:30	Reception and registration of participants
14:30-14:45	Welcome Address - *Fernando Larcher; Diego Velasco*
14.45-15.45	Keynote conference: Human epidermal stem cells in skin regeneration - *Michele De Luca*
15.45-16.15	Coffee break
16.15-16.45	Human and mouse keratinocyte culture methods I - *Fernando Larcher*
16.45-17.30	Human and mouse keratinocyte culture methods II. Derivation from iPSC - *Christine Baldeschi*

DAY 2
Tuesday, 02 July 2024

3D skin cultures

09.00-09.30	Overview 3D skin cultures - *Fernando Larcher*
09.30-10.15	Plasma-based skin equivalents - *Sara Llames*
10.15-10.45	Complex organotypic skin models - *John Connelly*
10.45-11.15	Coffee Break
11.15-11.45	Skin organoids - *Julia Reichelt*
11.45.12.15	Skin Bioprinting - *Diego Velasco*
12.15-13.30	Demonstration organotypic culture preparation - *Sara Llames; Diego Velasco*
13.30-14.30	Lunch Break
14.30-16.00	Demonstration Skin Bio-printing - *Diego Velasco*
16.00-18.00	Presentations by participants

DAY 3
Wednesday, 03 July 2024

Wound healing and skin diseases models

09.00-09.45	Critical players in normal and impaired wound healing - *Sabine Werner*
09.45-10.15	GPCR in skin homeostasis and regeneration- *Marta Carretero*
10.15-11.00	Mesenchymal stem cells to treat chronic skin wounds - *María J Escamez*
11.00-11.30	Coffee break
11.30-12.15	Skin substitutes for chronic ulcers, burns and large wounds - *Sara Llames*
12.15-12.45	Advanced wound healing therapies - *Marta Carretero*
12.45-14.00	Lunch Break
14.00-14.30	Introduction 3D, KO mice, skin-humanized models - *Fernando Larcher*
14.30-15.15	Animal skin disease models I. Prevalent diseases - *Paloma Pérez*
15.15-16.00	Animal skin disease models II (rare diseases) - *Alex Nystrom*
16.00-16.30	Coffee break
16.30-18.00	Presentations by participants.

DAY 4
Thursday, 04 July 2024

Gene therapy and clinical studies

09.00-09.30	Skin gene therapy overview - *Fernando Larcher*
09.30-10.15	Genome editing I - *Ulrich Koller*
10.15-11.00	Genome editing II (in vivo) - *Marta García*
11.00-11.30	Coffee Break
11.30-12.15	Exon skipping / AONs - *Matthias Titeux*
12.15-12.45	Overview of Cell and gene therapy clinical trials for genodermatoses - *Fernando Larcher, María José Escamez*
12.45-13.30	Ex vivo gene therapy in the clinic - *Peter Marinkovich*
13.30-14.00	In vivo gene therapy in the clinic - *Peter Marinkovich*
14.00-15.00	Lunch Break
15.00-16.30	Demonstration: keratinocyte genome editing - *TBD*
16.30-18.00	Presentations by participants
20.30-22.30	Networking Dinner with participants and faculty members

DAY 5
Friday, 05 July 2024

Omics and AI in dermatological research

09.00-09.45	Multiomic studies of skin biology and pathology. Overview - *Carlos León*
09.45-10.15	Dissecting complex cutaneous traits trough RNAseq - *Ramón G. Escudero*
10.15-11.00	Cell heterogeneity. Single cell RNAsec-studies - *Clarisse Ganier*
11.00-11.30	Coffee Break
11.30-12.00	Artificial intelligence to study rare diseases including genodermatoses - *Joaquin Dopazo*
12.00-14.00	Presentations by participants
14.00	Closing of the course and farewell - Fernando *Larcher*

The course might be subject to change

EADV
European Academy of Dermatology and Venereology
Via Balestra 22 B, 6900 Lugano, Switzerland
www.eadv.org

ESDR
European Society for Dermatological Research
Rue Cingria 7, 1205 Geneva, Switzerland
www.esdr.org