

COURSE OUTLINE

Day 1: Basic Skin Science 2019—Basic Skin Anatomy and Physiology

Introduction

- Reflections on 40 years of skin science
- Functions of Human Skin
- Hair follicles, sweat glands and finger nails

The Epidermis- Basics

- The dermal epidermal junction
- Keratinocytes – the workhorse cell of the integument
- Keratins – Key structural proteins of the skin (and hair and nail)
- The stratum granulosum and formation of the stratum corneum

The Stratum Corneum (SC) Barrier-Basic Structure- Bricks and Mortar

- SC Barrier Lipids – The mortar
- The Corneocyte Bricks
- Skin penetration pathways and alleged pathways - basics
- Filaggrin and Natural Moisturizing Factors - basics
- Corneodesmosomes, digestion and desquamation

The Science and Technology of Skin Cleansing

- Short intro to skin cleansing technology evolution
- Surfactants and their interactions with skin proteins and lipids
- Skin mildness – understanding skin irritation and dryness
- Importance of skin sensory in cleansing
- Advanced care from cleansers – moisturization and beyond
- Technologies for compromised skin conditions – infant skin, ageing skin, sensitive skin

Skin Moisturization Technologies

- Factors leading to dry skin
- Outside-in approach –
 - Occlusives,
 - Humectants,
 - Lipid technologies
- Inside-out approaches
 - Lipid-precursor technologies
 - Activating skin to make better barrier – PPARs
- Assessing barrier quality
 - TEWL tape strip methodologies
 - In-vivo spectroscopic methods - ATR/IR

Non-Invasive Testing of Skin Function: Basic Methods

- Transepidermal water loss and skin barrier function
- Electrical measurements and skin hydration
- Mechanical properties – the Cutometer
- Skin Color measurements-meters and photographic techniques
- 3 D Texture Analysis
- Biomarker analysis – the wave of the future?
 - Markers of barrier function
 - Markers of inflammation
- Gender and ethnic differences in biophysical properties
 - Gender differences – are they real
 - Ethnic differences in skin properties
 - Differences in baseline properties
 - Is response to irritant different among ethnic group?
 - Is it ethnic origin or only skin pigment type that matters

Day : Advanced Skin Science 2019—Advanced Topics on the Epidermis and Stratum Corneum

The Epidermis

- The dermal epidermal junction
- Stem cells and cell renewal in the epidermis, how does it work?
- Epidermal Keratins structural details and disorders
- Desmosomes in the epidermis
- Tight Junctions in the epidermis

The Stratum Corneum (SC) Barrier:

- Keratins and filament formation
- Structure and formation of the cornified cell envelope
- Filaggrin hydrolysis and natural moisturizing factors
- SC pro barrier and lipids
- SC desmosomes and the complex proteolytic cascade in the SC
- Barrier repair and homeostasis
- The antimicrobial barrier of the Stratum Corneum

Recent Advances in our Understanding of Skin Lipids

- Sebaceous lipids – positives and negatives
- Sebaceous lipids vs stratum corneum integral lipids
- Recent advances in our understanding SC lipid ultra-structure
- In-vivo ATR methodology for probing SC lipid structure
- Review of technologies for maintaining

Skin Pigmentation

- Melanocytes and melanin disorders,
- Melanosome synthesis and translocation,
- Constitutive and facultative pigmentation,
- Genetic and other Factors Determining Skin Color

Skin Aging and Photo-Aging

- Aging of the Epidermis and Stratum Corneum
- The dermal matrix and Intrinsic aging
- Acute effects of sun on skin,
- Reactive oxygen species
- The MAP Kinase pathway and MMPs
- Photoaging in histology
- Photoaging in Appearance

Skin pH and Its Role Maintaining Superior SC Barrier

- Acid-mantle and its origin
- Is skin pH an indicator of skin health?
- Factors that can affect skin's natural pH
- Skin pH vs product pH – relevance to skin care
- Skin pH vs product pH – relevance to skin cleansing

The Dermis – and Skin Appendages

- The papillary and reticular dermis

