

MEDELLIN -COLOMBIA JUNE 5-8, 2018





COURSE ON SYSTEMS BIOLOGY FOR A SUSTAINABLE BIOECONOMY: PRINCIPLES AND APPLICATIONS

INTRODUCTION

Systems biology and/or metabolic engineering aims to understand complex biological systems through mathematical modeling and *in silico* simulations. This is a highly interdisciplinary field of study, which follows a holistic approach to understand how biological systems function and interact among them. Special attention should be paid to using tools of metabolic engineering for designing bioprocesses from a rational approach.

Although metabolic engineering has been applied worldwide since early 1990s, its introduction in formal educational programs in Colombia and surrounding countries is not yet widely applied due to a shortage of professionals educated on this topic, and limitations in the available technologies.

INVITED LECTURERS

Aljoscha Wahl / TUDelft – The Netherlands Isabel Rocha / Universidade do Minho - Portugal Walter van Gulik / TUDelft – The Netherlands Katharina Nöh / Jülich Institute – Germany Alexander de Luna Fors / Cinvestav - Mexico

LOCAL ORGANIZERS AND TEACHING STAFF

Andres Gonzalez-Barrios / Universidad de los Andes Andres Pinzon-Velasco / Universidad Nacional de Colombia, Rigoberto Rios-Estepa / Universidad de Antioquia Camilo Suarez-Mendez / Universidad Nacional de Colombia,

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REGISTRATION AND INFO

https://minas.medellin.unal.edu.co/e ventos/systems-biology-for-asustainable-bioeconomy/index.php

GOAL

The course aims to provide students with tools of systems biology for designing bioprocesses including topics on cellular metabolism, analytical techniques, bioinformatics, metabolic flux analysis, strain development and applications

COURSE COORDINATOR

Camilo Alberto Suarez-Mendez Universidad Nacional de Colombia

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COURSE PROGRAM

DAY I WELCOME AND INTRODUCTORY LECTURES

8:00 - 9:00	Registration
9:00 - 9:30	Introduction and Course Overview I Camilo Suarez-Mendez
9:30 - 10:45	Introduction to Cellular Metabolism I Walter van Gulik
10:45 – 11:00	Coffee break
11:00 – 12:15	Introduction to Microbial Growth Systems I Camilo Suarez-Mendez
12:20 – 14:00	Lunch time
14:00 - 15:30	Introduction to Energetics and Thermodynamics I Walter van Gulik
	in microbial systems
15:30 - 17:30	Poster session / Interacting with invited speakers I Selected attendees
January Martin	PDdr58

DAY 2 OMICS TECHNOLOGIES AND METABOLIC MODELING

8:00 – 9:15	Introduction to Genomics and Metagenomics I Andres Gonzalez-Barrios
9:15 – 10:30	Introduction to Proteomics I Aljoscha Wahl
10:30 - 10:45	Coffee break
10:45 - 12:15	Introduction to Flux Analysis, FBA and MFA I Isabel Rocha
12:15 - 14:00	Lunch time
14:00 - 15:15	Introduction to 13C-MFA I Katharina Nöh
15:15 – 15:30	Coffee break
15:30 - 18:30	Workshop Metabolic Modeling I Aljoscha Wahl – Camilo Suarez-Mendez



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COURSE PROGRAM

DAY 3 OMICS TECHNOLOGIES AND METABOLIC MODELING

8:00 - 9:15	Introduction to Bioinformatics and I Andres Pinzon-Velasco
	Computational Systems Biology
9:15 – 10:30	Introduction to Metabolomics I Walter van Gulik
10:30 - 10:45	Coffee break
10:45 – 12:00	Introduction to Transcriptomics I Rigoberto Rios-Estepa
12:00 – 14:00	Lunch time
14:00 – 15:30	Workshop Metabolic Modeling I Aljoscha Wahl – Katharina Nöh
15:30 - 15:45	Coffee break
15:45 – 18:30	Workshop Metabolic Modeling I Aljoscha Wahl – Katharina Nöh

DAY 4

APPLICATIONS OF SYSTEMS BIOLOGY

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8:00 - 9:00	Applications of systems biology in Plant Biotechnology I Rigoberto Rios-Estepa
	Metabolic Engineering of Jatropha curcas
9:00 - 10:00	Applications of systems biology in Industrial Biotechnology I Isabel Rocha
	Yeast metabolic chassis designs for diverse biotechnological products
10:00 - 10:15	Coffee break
11:15 – 12:30	Applications of systems biology: a case study I Alexander de Luna Fors
	Genomewide mechanisms of aging and longevity in the budding yeast
12:30 - 14:00	Lunch time
14:00 - 15:00	Applications of systems biology: a case study I Andres Gonzalez-Barrios
15:00 - 15:15	Coffee break
15:30 – 18:30	Forum: Present and future of systems biology I All invited lecturers and local staff
	for a sustainable bioeconomy

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