



UNIVERSITAT
ROVIRA I VIRGILI

FUNDACIÓ URV
CENTRE DE FORMACIÓ PERMANENT

AptaSel - International training on SELEX (Initial + Advanced)

Ficha Técnica

Código:

CSELEXN-A2-2019-2

Título al que da derecho:

Certificado de Aprovechamiento

Dirigido a:

Students and research professionals interested in practical and theoretical aspects of SELEX, from sample preparation to data analysis

Objetivos:

The pre-SELEX course provides a detailed theoretical overview of the polymerase chain reaction (PCR), with practical hands-on training. The aim is to understand how to use PCR specifically for the SELEX process, strategies and approaches for optimising PCR performance and to gain an understanding of how to analyze the results. The second part of the pre-SELEX course is focused on the characterization of the target and on the evaluation of different partitioning strategies, implementing critical quality control steps needed to assure reliable results during aptamer selection. The advanced SELEX course consists of a theoretical part and a practical part, where participants have the opportunity to carry out SELEX under experienced supervision. The course includes a comprehensive overview of different SELEX methodologies, Next Generation Sequencing, truncation studies, characterization of aptamers using binding assays as well as an introduction to aptamer based lateral flow assays.

Fechas:

del 17/O6/2019 al 21/O6/2019

Horario:

Monday to Friday from 9h30-13h30 and 14h30 -17h30

Ubicación:

ETSEQ - DEQ, Av. Països catalans, 26, 43307 Tarragona

Impartición:

presencial

Duración:

35 h

Precio:

1100

Coordinación académica:

Ciara O'Sullivan

Docentes:

Ciara O'Sullivan

Marketa Svobodova

Contacto FURV:

Susana Paxton - susana.paxton@fundacio.urv.cat

Más información:

Este curso cumple los requisitos para ser bonificado mediante FUNDAE. Para más información puede dirigirse a: bonificacio@fundacio.urv.cat

Programa

Módulo: Hands-on PCR

Duración: 7 h.

Contenido:

Hands-on PCR

- - Introduction to PCR (Polymerase Chain Reaction)
 - - Primer design and how to avoid primer dimer formation
 - - Design of a random DNA library
 - - PCR optimization of a random library
 - - Gel electrophoresis system and analysis of PCR data
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- Hands-on lab running PCR and analysis of PCR by gel electrophoresis system

Módulo: Target preparation

Duración: 7 h.

Contenido:

Target preparation

- - Targets, principal requirements for selection
 - - Characterization of selected target
 - - Partitioning strategies
 - - Immobilization of target, conjugation strategies
 - - Quality control
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- Hands-on lab SDS-PAGE (Sodium Dodecyl Sulfate PolyAcrylamide Gel Electrophoresis), different immobilization and conjugation strategies, competitive ELISA (Enzyme Linked ImmunoSorbent Assay) -bead assay

Módulo: Systematic Evolution of Ligands by EXponential Enrichment (SELEX)

Duración: 7 h.

Contenido:

- - Introduction to SELEX
- - Different SELEX strategies
- - Incubation and optimal conditions
- - PCR, PCR optimization of a random library
- - Preparation of single stranded DNA

- - Hands-on lab running SELEX (incubation, PCR, single stranded DNA preparation).

Módulo: Evolution, Next Generation Sequencing (NGS), Truncation studies

Duración: 7 h.

Contenido:

This part covers the monitoring of evolution during SELEX, which allows control and adjustment of the selection pressure and stringency to achieve the desired properties of the selected aptamers. Next Generation Sequencing and data analysis with the interpretation of results and finally determination of secondary structure and truncation studies will be also discussed.

- - Monitoring of evolution during SELEX
- - NGS and data analysis
- - Truncation studies

- Hands-on lab evolution studies (APAA (Apta PCR affinity assay), SPR (Surface Plasmon Resonance), training on analysis of NGS data and truncation studies.

Módulo: Binding assays or Lateral Flow Assays (LFAs)

Duración: 7 h.

Contenido:

Option A) Binding assays

The different binding assays that are routinely used to study the specificity and affinity of aptamers are described and the suitability for different types of binding assays for various types of targets is described.

- - Different binding assays: SPR, SPRi (Surface Plasmon Resonance imaging), APAA, ELAA (Enzyme Linked aptamer Assay), EMSA (Electrophoretic Mobility Shift Assay, MST (MicroScale thermophoresis) and BLI (BioLayer Interferometry).
- - Suitability of binding assays to specific targets

- Hands-on lab binding assays (SPR, SPRi, APAA, ELAA, EMSA, MST and BLI)

Option B) Lateral Flow Assays (LFAs)

An introductory overview of lateral flow assays is provided, where the essential components of these assays and their importance is explained. Fundamental assay considerations and the implementation of aptamers in different lateral flow assay formats will be described.

- Introduction to aptamer based LFAs
- Hands-on lab competitive/sandwich aptamer based LFAs

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