UNIVERSIDAD DE CHILE
FACULTAD DE MEDICINA
ESCUELA DE POSTGRADO

CURSO DE POSTGRADO

Basic and Novel concepts in Biomedical Signaling

Nombre Curso

SEMESTRE *1º* **AÑO** *2026*

PROF. ENCARGADO	Andrew Quest Lorena Lobos	14.672.243-1 13.026.059-4
	Nombre Completo	Cédula Identidad

Center for studies on Extracellular vesicles, Metabolism and Cancer (CEMC), Núcleo Interdisciplinario de Biología y Genética (NIBG) Instituto de Ciencias Biomédicas (ICBM), Facultad de Medicina, Universidad de Chile

UNIDAD ACADÉMICA

TELÉFONO *22-9789531* **E-MAIL** aquest@u.uchile.cl - lorotae@uchile.cl

TIPO DE CURSO *Basico*

(Básico, Avanzado, Complementario, Seminarios Bibliográficos, Formación General)

CLASES	**34.5 H**
SEMINARIOS	**25.5 H**
PRUEBAS	**6 H**
TRABAJOS	**20 H**
Nº HORAS PRESENCIALES	**66 H**
Nº HORAS NO PRESENCIALES	**144 H**
Nº HORAS TOTALES	**210 H**

CRÉDITOS *7*

(1 Crédito Equivale a 30 Horas Semestrales)

CUPO ALUMNOS *3* (N° mínimo) *20* (N° máximo)

PRE-REQUISITOS A reasonable understanding of cell and molecular biology. Ability to read and understand papers in English.

INICIO **07 - April - 2026** **TERMINO** **01 July - 2026**

DIA/HORARIO POR SESION *Tuesday 14:00-17:30 h* **DIA / HORARIO POR SESION** *Wednesday 09:00-12:30 h*

LUGAR ***AUDITORIO CEMC,*** *1er piso, Block B - Nucleo Interdisciplinario de Biologia y Genetica, Instituo de Ciencias Biomedicas (ICBM), Facultad Medicina, Universidad de Chile*

Escuela De Postgrado (Sala a determinar) u otro lugar

METODOLOGÍA

The course will last 12 weeks and consist of 1-2 lectures one day (Wednesday) followed by a discussion of 2 papers dealing with the respective topics the following week (Tuesday)

EVALUACIÓN (INDICAR % DE CADA EVALUACION)

Students will be evaluated in 2 separate blocks:
First block (8 weeks)

- Oral participation in discussion of papers every week (30%)
- Answer in writing to short questions every week (20%)
- Oral exam including formulation/discussion of mini project (50%)

Second block (4 weeks)

- Oral participation in discussion of papers every week (30%)
- Answer in writing to short questions every week (20%)
- Final written exam (50%)

Grades from these activities will be averaged taking into account the percentiles indicated to generate the final grade for each block. The average grades from the first and second blocks will be equivalent to 65% and 35%, respectively, of the final grade of the course.

Attendance Requirements
Clases: greater than 80%
Seminars: 100%

PROFESORES PARTICIPANTES (INDICAR UNIDADES ACADEMICAS)

- Interdisciplinary Nucleus in Biology y Genetics, Institute of Biomedical Sciences (ICBM): Andrew Quest Ph.D. (Professor), Lorena Lobos (Associate Professor)
- INTA: Mariana Cifuentes, PhD (Professor)
- Faculty of Odontology: Vicente Torres (Associate Professor)
- Universidad Andres Bello (UNAB): Martin Montecino (Professor)

DESCRIPCIÓN

In this course basic to advanced knowledge in a number of signaling pathways relevant to the development of human diseases will be discussed. The importance of protein targeting, supramolecular complex formation and compartmentalization of signaling molecules will be emphasized.

OBJETIVOS

Main objective: Understand the mechanisms of signal transduction and how malfunction of such processes leads to disease.

CONTENIDOS/TEMAS

Specífic aims: During the first 8 weeks, lectures will focus on building an understanding of individual signaling pathways involving receptors (Tyrosine kinases, G-protein-coupled, cytokine, nuclear) the universal second messengers (Calcium, cyclic AMP and cyclic GMP, lipid second messengers, etc), protein kinases (src, raf-MAPK, PKC, etc.), phosphatases, proteases, downstream effector molecules, including how these events can lead to changes in gene transcription. The seminars will provide a forum for the discussion of the relevant literature. In the subsequent 4 weeks, some examples of more complex signaling “organelles” and their relevance to biomedical processes will be discussed.

BIBLIOGRAFIA BASICA

Participants should have some basic knowledge of cell and molecular biology, as well as signalling pathways at a level taught in undergraduate courses

BIBLIOGRAFIA RECOMENDADA

Recommended reading will be provided prior to the respective lectures.

Calendario de actividades

BASIC AND NOVEL CONCEPTS CELL SIGNALING 2026

		FECHA	HORAS PRESENCIALES	HORAS PRESENCIALES	DESCRIPCION ACTIVIDAD	PROFESOR
1	Tuesday	07 April	14.00 - 15.00 15.30 - 17.30	3	General introduction GPCRs & 2nd messengers	A. Quest L. Lobos
	Wednesday	08 April	09.00 - 10.30 11.00 – 12.30	3	Receptor / and Non-receptor tyrosine kinases	L. Lobos A. Quest
2	**Tuesday**	**14 April**	**14.00 -15.00 15.30- 17.30**	**3**	**Journal Club-1**	**L. Lobos A. Quest**
	Wednesday	15 April	09.00 - 12.30	3	Lipid second messengers	A. Quest
3	**Tuesday**	**21 April**	**14.00 - 17.30**	**3**	**Journal Club-2**	**A. Quest**
	Wednesday	22 April	9:00 – 12:30	3	Kinases: MAPKs, PKC, PI3K	A. Quest
4	**Tuesday**	**28 April**	**14.00 – 17:30**	**3**	**Journal Club-3**	**A. Quest**
	Wednesday	29 April	09.00 - 12.30	3	Phosphatases and Proteases	A. Quest
5	**Tuesday**	**05 May**	**14.00 – 17:30**	**3**	**Journal Club-4**	**A. Quest**
	Wednesday	06 May	09.00 – 12.30	3	Transcription factors	L. Lobos
6	**Tuesday**	**12 May**	**14.00 – 17.30**	**3**	**Journal Club-5**	**L. Lobos**
	Wednesday	13 May	09.00 – 12.30	3	Wnt/bcatenin signaling	V. Torres
7	**Tuesday**	**19 May**	**14.00 – 15.30**	**3**	**Journal Club-6**	**V. Torres**
	Wednesday	20 May	09.00 – 10.30	1.5	Epigenetic Regulation	M. Montecino
8	**Wednesday**	**20 May**	**11.00 – 12.30**	**1.5**	**Journal Club-7**	**M. Montecino**
	Tuesday	26 May	14:00-17:30	3	Intermediate oral exam: Presentation of project proposal	A. Quest L. Lobos
	Wednesday	27 May	09:00 – 12:30	3	Discussion intermediate exam Compartmentalization part I Compartmentalization part II	A .Quest L. Lobos
9	**Tuesday**	**02 Jun**	**14.00 – 17.30**	**3**	**Journal Club 8**	**A. Quest**
	Wednesday	03 Jun	09:00 – 12.30	3	Adhesion complexes	V. Torres
10	**Tuesday**	**09 June**	**14.00 – 17.30**	**3**	**Journal Club-9**	**V. Torres**
	Wednesday	10 June	09.00-12.30	3	Exosomes	L. Lobos A. Quest
11	**Tuesday**	16 June	**14.00 – 17.30**	3	**Journal Club-10**	L. Lobos A. Quest
	Wednesday	17 June	09.00-12.30	3	Inflammasome	M. Cifuentes
12	**Tuesday**	**23 June**	**14.00 – 17.30**	3	**Journal Club-11**	**M. Cifuentes**
	Wednesday	24 June	09.00-12.30	3	Summary discussion Preparation final exam	A. Quest L. Lobos
13	Wednesday	01 July	09.00-12.30	3	Final exam: written test	All