

Endocrinologia**2012/2013**

Codi: 100809

Crèdits ECTS: 6

Titulació	Pla	Tipus	Curs	Semestre
2500250 Graduat en Biologia	812 Graduat en Biologia	OT	4	2

Professor de contacte

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Utilització d'idiomes

Llengua vehicular majoritària: espanyol (spa)

Algun grup íntegre en anglès: No

Algun grup íntegre en català: No

Algun grup íntegre en espanyol: No

Prerequisits

Principalmente haber superado las asignaturas "Fisiología Animal: Sistemas" y "Fisiología Animal: Neurofisiología i Endocrinología", pero también se necesitan conocimientos de Biología Celular, Histología y Bioquímica

Objectius

La asignatura "Endocrinología" es una optativa del último curso, por lo que alumno tiene ya un gran nivel de conocimientos, incluidos los derivados de las asignaturas obligatorias de Fisiología Animal, que permitirá profundizar en esta materia.

Se usará fundamentalmente publicaciones científicas (Nature, Science, Cell, etc.) como fuente bibliográfica, lo que redundará en beneficio del alumno también desde el punto de vista del dominio del inglés.

Se analizará las funciones de los diversos ejes neuroendocrinos, dando mucho énfasis a las interacciones entre los mismos y con el sistema nervioso central. Además de los ejes endocrinos básicos, también se prestará atención a hormonas no glandulares.

La endocrinología de mamíferos será la parte fundamental de esta asignatura. En la medida de lo posible se analizarán las consecuencias prácticas de estudios en modelos animales para el ser humano.

Competències

- Analitzar i interpretar el desenvolupament, el creixement i els cicles biològics dels éssers vius.
- Aplicar recursos estadístics i informàtics a la interpretació de dades.
- Comprendre els processos que determinen el funcionament dels éssers vius en cada un dels seus nivells d'organització.
- Desenvolupar estratègies d'aprenentatge autònom.
- Desenvolupar un pensament i un raonament crítics i saber comunicar-los de manera efectiva, tant en les llengües pròpies com en una tercera llengua.
- Dissenyar i fer diagnòstics biològics i identificar i utilitzar bioindicadors.
- Fer proves funcionals i determinar, valorar i interpretar paràmetres vitals.
- Tenir capacitat d'anàlisi i de síntesi.
- Tenir capacitat d'organització i planificació

Resultats d'aprenentatge

1. Analitzar i interpretar paràmetres fisiològics indicadors del creixement i el desenvolupament animals.
2. Aplicar recursos estadístics i informàtics a la interpretació de dades.
3. Desenvolupar estratègies d'aprenentatge autònom.
4. Desenvolupar un pensament i un raonament crítics i saber comunicar-los de manera efectiva, tant en les llengües pròpies com en una tercera llengua.
5. Fer proves funcionals i determinar, valorar i interpretar paràmetres vitals dels animals.
6. Identificar, enumerar, descriure, interpretar, explicar i resumir l'estructura i el funcionament del sistema endocrí.
7. Identificar, enumerar, seleccionar, descriure, interpretar, explicar i resumir les habilitats pràctiques necessàries per aplicar les tècniques d'estudis funcionals més freqüents.
8. Identificar, enumerar, seleccionar, descriure, interpretar, explicar i resumir les habilitats pràctiques necessàries per aplicar les tècniques de diagnosi i valorar la utilització de bioindicadors
9. Tenir capacitat d'anàlisi i de síntesi.
10. Tenir capacitat d'organització i planificació.

Continguts

TEORÍA

1. Introducción. Hormonas: moléculas difusibles de señalización. Origen evolutivo del sistema endocrino. Coevolución de hormonas y sus receptores. Familias generales de receptores endocrinos y sus principales características.
2. Control del sistema endocrino por el hipotálamo. Unidad hipotálamo-pituitaria. Nociones sobre el desarrollo del hipotálamo y la hipófisis; bolsa de Rathke. Factores críticos.
3. Control del peso corporal: ingesta y gasto energético. Mecanismos centrales y periféricos. NPY/AGRP, POMC-aMSH /CART, GABA, leptina, insulina. Otros factores orexigénicos/anorexigénicos.
4. Ritmos biológicos. Uso de la luz y de la alimentación como mecanismos sincronizadores. Núcleo supraquiasmático: divisiones, conexiones y principales factores implicados.
5. Neuroendocrinología del eje hipotálamo-hipofisario-adrenal (HPA): CRH-ACTH-GC. Familia CRH/urocortina. Distribución de las neuronas de CRH. Núcleo paraventricular: divisiones, conexiones y principales factores implicados. Receptores CRH1, CRH2, GR, MR. Eje HPA y malnutrición. Funciones centrales del CRH. Respuesta al estrés. Estrés, eje HPA & ansiedad, depresión. Interacciones con el sistema inmunitario.
6. Neuroendocrinología del eje hipotálamo-hipofisario-tiroideo (HPT): TRH-TSH-T3, T4. Distribución de las neuronas de TRH. Regulación de la síntesis y secreción de TRH: temperatura, malnutrición, estrés, interacción con el sistema inmunitario. Funciones centrales de TRH.
7. Crecimiento I. Heredabilidad & susceptibilidad. Aceleración & desaceleración. Catch-up. Senescencia. Crecimiento saltatorio. Crecimiento & desarrollo intrauterino: principales familias de factores de crecimiento (IGF, EGF-TGF-, FGF, PDGF, VEGF, TGF-b...). Crecimiento & gene imprinting.
8. Crecimiento II. Crecimiento postuterino. Gigantismo y enanismo GH-dependiente. Neuroendocrinología del eje hipotálamo-hipofisario-"somático": GHRH-GH-IGF-1. Familia GHRH/PACAP/glucagón... Distribución de las neuronas de GHRH y somatostatina que controlan la GH. Regulación eje HPS: integración con el sistema de control del peso, esteroides sexuales, tiroideas, glucocorticoides.
9. Crecimiento III: Unidad funcional GH-IGFs, efectos directos vs indirectos GH. IGFbps. Papel de otras hormonas: tiroideas (y TSH), esteroides sexuales (y FSH), leptina y simpático, glucocorticoides. RANK y RANKL. Malnutrición & obesidad exógena & insulina. Enanismo psicosocial.
10. Crecimiento y aporte calórico: relación aparente con el envejecimiento. Posible papel del eje GH-IGF-II/insulina. Sirtuinas. mTOR. Estrés oxidativo. ADN mitocondrial. p53. Telómeros.

11. Diferenciación sexual: sexo genético, gonadal y fenotípico. XIC: X inactivation center. SRY y otros factores críticos en el desarrollo & mantenimiento gonadal. Genitales internos y externos: principales hormonas implicadas. Estados intersexuales: clasificación de Prader.

12. Neuroendocrinología del eje hipotálamo-hipofisario-gonadal. Distribución de las neuronas de GnRH. Regulación de la síntesis y secreción de GnRH: generador de pulsos *versus* pico preovulatorio. Funciones centrales de GnRH. Pubertad: neuronas KiSS.

13. Diferenciación sexual de la conducta I. Psicoendocrinología. Información genética *versus* ambiente. Conducta sexual de modelos animales: Acción organizadora y activadora de las hormonas sexuales. Bases neurales de las diferencias sexuales en la conducta. SRY y cerebro. Genomic imprinting & cerebro.

14. Diferenciación sexual de la conducta II. Elección de pareja. Proceptividad, atractividad y receptividad: factores que parecen influir en primates/humanos. Olores, feromonas, y MHC. Sexo, recompensa y vínculos de pareja: vasopresina, oxitocina y dopamina. OT, VP & conductas sociales. Conducta maternal: OT, esteroides sexuales, prolactina. Neuronas PHDA, THDA, TIDA.

15. Diferenciación sexual de la conducta III. Identidad de género, transexualidad. Comportamiento de género. Diferencias sexuales cognitivas. Orientación de género.

16. α -MSH. Proopiomelanocortina (POMC). Distribución de las células de POMC: expresión central *versus* periférica. Función clásica de la α -MSH: control de los cromatóforos. Funciones no clásicas: melanocortinas.

PRÁCTICAS

Estudio de la diabetes experimental inducida por estreptozotocina en rata

Metodología

Las actividades formativas se componen (a) de clases teóricas, con el formato habitual de clase magistral apoyada por imágenes obtenidas normalmente de artículos científicos. Mucho de este material estará a disposición del alumno en el campus virtual; (b) prácticas, en las que se analizará un modelo animal de diabetes experimental; y (c) seminarios, donde en la medida de lo posible se efectuarán pruebas funcionales con los alumnos. Estas actividades necesariamente se han de complementar con otras supervisadas y autónomas.

Activitats formatives

Títol	Hores	ECTS	Resultats d'aprenentatge
Tipus: Dirigides			
Clases teóricas	35	1,4	1, 3, 4, 5, 6, 7, 9, 10
Prácticas	12	0,48	1, 2, 3, 5, 6, 7, 8, 9, 10
seminarios	4	0,16	2, 3, 4, 9, 10
Tipus: Supervisades			
Preparación de seminarios	6	0,24	2, 9, 10
Tipus: Autònomes			
Elaboración de trabajos	14	0,56	2, 3, 4, 6, 9, 10
Estudio	65	2,6	1, 3, 4, 5, 6, 7, 9

Avaluació

Los conocimientos teóricos se valorarán mediante dos parciales; deberá superarse el 4.5 para poder hacer media de los dos parciales. Caso de que deba realizarse (al final del curso) el examen de recuperación, éste podrá ser del primer, segundo o ambos parciales en función de las notas obtenidas anteriormente. El examen será tipo test, de 4 posibles respuestas siendo cierta solo una, y usando la penalización blanda en la corrección.

Las prácticas se valorarán mediante la presentación de resultados y examen tipo test.

Los seminarios se valorarán mediante presentación y discusión de resultados y examen tipo test.

Se ha de superar el 5 en conjunto para aprobar la asignatura

Activitats d'avaluació

Títol	Pes	Hores	ECTS	Resultats d'aprenentatge
Examen de teoria	80%	6	0,24	1, 3, 5, 6, 7, 8, 9, 10
Pràcticas	10%	4	0,16	1, 2, 3, 4, 5, 6, 7, 8, 9
Seminarios	10%	4	0,16	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bibliografia

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Publicació Philadelphia : Saunders Elsevier, c2008

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INTRODUCCIÓN

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