

Biology 37 s14**Endocrinology****Weekly Schedule 10A**

Lectures/Paper Discussions: Tuesday and Thursday 10-11:50

X-hour: Wed 3-3:50 (Problem-solving exercises, patient presentations or videos)

Text/Reading:

- 1. Text: None required.** Texts available on Course Reserve (Dana) (one also as e-text via Canvas link)
- 2. Course Reader:** Collection of 37 manuscripts together with study guides that are required course reading. Available at Wheelock Books. All are also posted as .pdf files on the course Canvas site. Some papers have supplemental data that is only on the Canvas site.

Faculty: Professor Lee Witters

Date	Topic	Prob Set Posted	Prob Set Due
Tuesday, March 25	Lectures 1: Course Introduction and Overview of the Mammalian Endocrine System		
Wednesday, March 26	NO X-HOUR		
Thursday, March 27	Lecture 2: Hormone Receptors; Mechanisms of Hormone Action I		
Tuesday, April 1	Lecture 2 Reading; Lecture 3: Mechanisms of Hormone Action II		
Wednesday, April 2	X-Hour: Problem-Solving in Endocrinology- Guide to Success		
Thursday, April 3	Lecture 3 Reading; Lecture 4: Pituitary and Hypothalamus-An Overview		
Tuesday, April 8	Lecture 4 Reading; Lecture 5: Hypothalamic/Pituitary/Gonadal Axis		
Wednesday, April 9	X-Hour: Group Problem-Solving: A Mystery Case		
Thursday, April 10	Lecture 5 Reading; Lecture 6: Sex Steroids; Hormones of Pregnancy & Lactation		
Friday, April 11		#1	
Tuesday, April 15	Lecture 6 Reading; Lecture 7: The Adrenal Cortex and Its Hormones		
Wednesday, April 16	X-Hour: Group Problem-Solving: Two Mystery Cases		
Thursday, April 17	Lecture 7 Reading; Lecture 8: Sexual Differentiation and Puberty		#1
Tuesday, April 22	Lecture 8 Reading; Lecture 9: Growth Hormone and Related Growth Factors		
Wednesday, April 23	X-Hour: Patient Visit and Presentation		
Thursday, April 24	Lecture 9 Reading; Lecture 10: Thyroid Hormones		
Saturday, April 26, 6-8PM	Mid-Term Exam Review Session		
Monday, April 28, 7-9 PM	Mid-Term Exam		
Tuesday, April 29	Lecture 10 Reading; Lecture 11: Calcium-Regulating Hormones: PTH and Vitamin D		
Wednesday, April 30	X-Hour: Video: Gender Confusion?		
Thursday, May 1	Lecture 11 Reading; Lecture 12: Hormone Production by "Non-Endocrine" Tissue		
Friday, May 2		#2	
Tuesday, May 6	Lecture 12 Reading; Lecture 13: Fuel Homeostasis and Pancreatic Hormones		
Wednesday, May 7	X-Hour: Group Problem-Solving: Two Mystery Cases		
Thursday, May 8	Lecture 13 Reading; Lecture 14: Diabetes Mellitus: History & Molecular Pathogenesis		
Friday, May 9			#2
Tuesday, May 13	Lecture 14 Reading; Lecture 15: Body Weight: Obesity and Type 2 Diabetes		
Wednesday, May 14	X-Hour: Patient Visit and Presentation		
Thursday, May 15	Lecture 15 Reading; Lecture 16: Body Weight: Anorexia Nervosa		
Tuesday, May 20	Lecture 16 Reading; Lecture 17: Neoplasia & Immunoendocrinopathy	#3	
Wednesday, May 21	X-Hour: Video: Anorexia Nervosa		
Thursday, May 22	Lecture 17 Reading; Lecture 18: What is a Hormone Anyway?		
Tuesday, May 27	NO CLASS		#3
Thursday, May 29, 6-8 PM	Final Exam Review Session		
Saturday, May 31, 3-6 PM	Final Exam		

Companion Required Reading for Lecture Series

Note: Students are expected to read these papers prior to the class discussion; note that each set corresponds to the subject of the lecture in the previous class. Papers with * or ** are included as .pdf files on course web site. Papers with ** have photographs or color figures that should be looked at on the web site. Some papers have supplemental data included only on the web site, but should be consulted.

For Thursday, March 27: Course Introduction and Overview

Canvas Site Reading: Chapter 1, Principles of Endocrinology, in Williams Textbook of Endocrinology, Melmed, Polonsky, Larsen & Kronenberg, eds, 12th edition (e-text with link to Lecture 1 from Canvas 'Syllabus' page)

For Tuesday, April 1: Hormone Receptors ; Mechanisms of Hormone Action I

**Bochukova, E et al (2012) A mutation in the thyroid hormone receptor alpha gene, *New Engl J Med*, 366, 243-249 [supplemental data on web site].

For Thursday, April 3: Hormone Receptors ; Mechanisms of Hormone Action II

*Swords, F.M. et al (2002) Impaired desensitization of a mutant adrenocorticotropin receptor associated with apparent constitutive activity, *Mol Endo*, 16, 2746-2753

**Jiang, S. et al (2011) Functional characterization of insulin receptor gene mutations contributing to the Rabson-Mendenhall syndrome—phenotypic heterogeneity of insulin receptor gene mutations, *Endocrine J*, 58, 931-940

For Tuesday, April 8: Pituitary and Hypothalamus: An Overview

**Kelberman, D et al (2009) Molecular analysis of novel *PROPI* mutations associated with combined pituitary hormone deficiency (CPHD), *Clin Endo*, 70, 96-103

**Siggaard, C. et al (1999) Clinical and molecular evidence of abnormal processing and trafficking of the vasopressin preprohormone in a large kindred with familial neurohypophyseal diabetes insipidus due to a signal peptide mutation, *J Clin Endo Metab*, 84, 2933-2941

For Thursday, April 10: Hypothalamic/Pituitary/Gonadal Axis

**Bouligand, J et al (2009) Isolated familial hypogonadotropic hypogonadism and a *GNRH1* mutation, *New Engl J Med*, 360, 2742-2748

**Topaloglu, AK et al (2012) Inactivating *KISS1* mutation and hypogonadotropic hypogonadism, *New Engl J Med*, 366, 629-635 [+ supplemental data included]

**Tello, JA et al (2012) Congenital hypogonadotropic hypogonadism due to GnRH receptor mutation in three brothers reveal sites affecting conformation and coupling, *PLoS One*, 7, e38456

For Tuesday, April 15: Sex Steroids; Hormones of Pregnancy and Lactation

**Quaynor, SD et al (2013) Delayed puberty and estrogen resistance in a woman with estrogen receptor a variant, *New Engl J Med*, 369, 164-171 [+supplemental data on web site]

**Shozu, M. et al (2003) Estrogen excess associated with novel gain-of-function mutations affecting the aromatase gene, *New Engl J Med*, 348, 1855-1865

For Thursday, April 17: The Adrenal Cortex and Its Hormones

**Geller, D.S. et al (2000) Activating mineralocorticoid receptor mutation in hypertension exacerbated by pregnancy, *Science*, 289, 119-123

**Samuels, ME et al (2013) Bioinactive ACTH causing glucocorticoid deficiency, *J Clin Endo Metab*, 98, 736-742 [+supplemental data on website]

For Tuesday, April 22: Sexual Differentiation and Puberty

**Teles, MG et al (2008) A GPR54-activating mutation in a patient with central precocious puberty, *New Engl J Med*, 358, 709-715 [+on-line supplemental data].

**Liu, G. et al (1999) Leydig-cell tumors caused by an activating mutation of the gene encoding the luteinizing hormone receptor, *New Engl J Med*, 341, 1731-1736

* Mystery case: A case of mistaken gender identity

For Thursday, April 24: Growth Hormone and Related Growth Factors

**Besson, A et al (2005) Short stature caused by a biologically inactive mutant growth hormone (GH-C53S), *J Clin Endo Metab*, 90, 2493-2499

**Woods, K.A. et al (1996) Intrauterine growth retardation and postnatal growth failure associated with deletion of the insulin-like growth factor I gene, *New Engl J Med*, 335, 1363-1367

**Abuzzahab, M.J. et al (2003) IGF-1 receptor mutations resulting in intrauterine and postnatal growth retardation, *New Engl J Med*, 349, 2211-2222

For Tuesday, April 29: Thyroid Hormones

**Liu, Z et al (2011) Constitutive activation of the thyroid-stimulating hormone receptor (TSHR) by mutating Ile⁶⁹¹ in the cytoplasmic tail segment, *PLoS ONE*, 6, e16335

**Moreno, JC et al (2002), Inactivating mutations in the gene for thyroid oxidase 2 (THOX2) and congenital hypothyroidism, *New Engl J Med*, 347, 95-102.

For Thursday, May 1: Calcium-Regulating Hormones

**Malloy, PJ et al (2002) A novel mutation in helix 12 of the Vitamin D receptor impairs coactivator interaction and causes hereditary 1, 25-dihydroxyvitamin-D-resistant rickets without alopecia, *Mol Endo*, 16, 2538-2546

**Pallais, J.C. et al (2004) Acquired hypocalciuric hypercalcemia due to autoantibodies against the calcium-sensing receptor, *New Engl J Med*, 351, 362-369

For Tuesday, May 6: Hormone Production by "Non-Endocrine" Tissue

- *Stewart, A.F. et al (1980) Biochemical evaluation of patients with cancer-associated hypercalcemia: evidence for humoral and nonhumoral groups, *New Engl J Med*, 303, 1377-1383.
- *Burtis, W.J. (1990) Immunochemical characterization of circulating parathyroid hormone-related protein in patients with humoral hypercalcemia of cancer, *New Engl J Med*, 322, 1106-1112.
- **Beuschlein, F. et al (2000) Acromegaly caused by secretion of growth hormone by a non-Hodgkin's lymphoma, *New Engl J Med.*, 342, 1871-1876.

For Thursday, May 8: Fuel Homeostasis and Pancreatic Hormones

- **Taschenberger, G. et al (2002) Identification of a familial hyperinsulinism in the sulfonylurea receptor I that prevents normal trafficking and function of K_{ATP} channels, *J Biol Chem*, 277, 17139-17146,
- *Féry, F. et al (1999) Impaired counterregulation of glucose in a patient with hypothalamic sarcoidosis, *New Engl J Med*, 340, 852-856.

For Tuesday, May 13: Diabetes Mellitus: Molecular Pathogenesis

- **Girard, CA et al (2009) Expression of an activating mutation in the gene encoding the K_{ATP} channel subunit Kir6.2 in mouse pancreatic β cells recapitulates neonatal diabetes, *J Clin Invest*, 119, 80-98\
- *Petersen, KF et al (2012) Reversal of muscle insulin resistance by weight reduction in young, lean, insulin-resistant offspring of parents with type 2 diabetes, *Proc Natl Acad Sci*, 109, 8236-8240

For Thursday, May 15: Body Weight: Obesity and Type 2 Diabetes

- **Farooqi, IS et al (2007) Clinical and molecular genetic spectrum of congenital deficiency of the leptin receptor, *New Engl J Med*, 356, 237-247 [+on-line supplemental data].
- ** Sumithran, P et al (2011) Long-term persistence of hormonal adaptations to weight loss, *New Engl J Med*, 365, 1597-1604 [+ supplemental data on web site]

For Tuesday, May 20: Body Weight: Anorexia Nervosa and Endocrine Dysfunction

- **Caronia, LM et al (2011) A genetic basis for functional hypothalamic amenorrhea, *New Engl J Med*, 364, 215-225
- *Chou, S et al (2011) Leptin is an effective therapy for hypothalamic amenorrhea, *Proc Natl Acad Sci*, 108, 6585-6590 [+supplemental data on web site]
- *Mitra, M et al (2011) Physiologic estrogen replacement increases bone density in adolescent girls with anorexia nervosa, *J Bone Min Metab*, 26, 2430-2438.

For Thursday, May 22: Neoplasia of Endocrine Glands/ Immunoendocrinopathy

- *Michiels, F-M et al (1997) Development of medullary thyroid carcinoma in transgenic mice expressing the RET protooncogene altered by multiple endocrine neoplasia type 2A mutation, *Proc. Natl. Acad. Sci. USA*, 94, 3330-3335.
- ** Knauf, JA et al (2005) Targeted expression of BRAF^{V600E} in thyroid cells of transgenic mice results in papillary thyroid cancers that undergo dedifferentiation, *Cancer Res*, 65, 4238-4245