**Course book (Advanced Endocrinology) (Ph. D Students ) 2019-2020**

**University of Salahaddin-Erbil**

**College of Science**

**Biology Department**

**Instructor**

 **Prof. Dr. Almas M.R Mahmud**

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| **No.**  | **Lecture Topics**  |
| 1 | Introduction to Endocrinology Coordination of Body Functions by Chemical Messengers Chemical Structure and Synthesis of Hormones Hormone Secretion, Transport, and Clearance from the Blood Feedback Control of Hormone Secretion Transport of Hormones in the Blood “Clearance” of Hormones from the Blood |
| 2 | Mechanisms of Action of Hormones  Signal Transduction pathways |
| 3 | Pituitary Hormones and Their Control by the Hypothalamus Pituitary Gland and Its Relation to the Hypothalamus Hypothalamus Controls Pituitary Secretion Hypothalamic-Hypophysial Portal BloodVessels of the Anterior Pituitary Gland  |
| 4 | Physiological Functions of Growth HormoneGrowth Hormone Promotes Growth of Many Body Tissues Growth Hormone Has Several Metabolic Effects Growth Hormone Stimulates Cartilage and Bone Growth Regulation of Growth Hormone Secretion Abnormalities of Growth Hormone SecretionPosterior Pituitary Gland and Its elation to the Hypothalamus Chemical Structures of ADH and Oxytocin Physiological Functions of ADH Oxytocic Hormone |
| 5 | Thyroid Metabolic Hormones Synthesis and Secretion of the Thyroid Metabolic Hormones 931Iodine Is Required for Formation of Thyroxine Iodide Pump (Iodide Trapping) Thyroglobulin, and Chemistry of Thyroxine and Triiodothyronine Formation Release of Thyroxine and Triiodothyronine from the Thyroid Gland Transport of Thyroxine and Triiodothyronine to Tissues |
| 6 | Physiologic Functions of the Thyroid Hormones Thyroid Hormones Increase the Transcription of Large Numbers of Genes Thyroid Hormones Increase Cellular Metabolic Activity Effect of Thyroid Hormone on Growth Effects of Thyroid Hormone on SpecificBodily Mechanisms Regulation of Thyroid Hormone Secretion Anterior Pituitary Secretion of TSH Is Regulated by Thyrotropin-ReleasingHormone from the Hypothalamus Feedback Effect of Thyroid Hormone to Decrease Anterior Pituitary Secretion of TSH |
| 7 | Diseases of the Thyroid Hyperthyroidism Symptoms of Hyperthyroidism Hypothyroidism Cretinis |
| 8 | Adrenocortical Hormones Synthesis and Secretion of Adrenocortical Hormones Functions of the Mineralocorticoids- Aldosterone Renal and Circulatory Effects of Aldosterone Cellular Mechanism of Aldosterone Action Regulation of Aldosterone Secretion |
| 9 | Functions of the Glucocorticoids Effects of Cortisol on Carbohydrate Metabolism Effects of Cortisol on Protein Metabolism Effects of Cortisol on Fat Metabolism Cortisol Is Important in Resisting Stress and Inflammation Cellular Mechanism of Cortisol Action Regulation of Cortisol Secretion by Adrenocorticotropic Hormone from thePituitary Gland |
| 10 | Adrenal Androgens Abnormalities of Adrenocortical Secretion Hypoadrenalism-Addison’s Disease Hyperadrenalism-Cushing’s Syndrome Primary Aldosteronism (Conn’s Syndrome) Adrenogenital Syndrome |
| 11 | Insulin, Glucagon, and Diabetes Mellitus Insulin and Its Metabolic Effects Effect of Insulin on Carbohydrate Metabolism Effect of Insulin on Fat Metabolism Effect of Insulin on Protein Metabolism and on Growth Mechanisms of Insulin Secretion Control of Insulin Secretion Other Factors That Stimulate Insulin Secretion Role of Insulin (and Other Hormones) in “Switching” Between Carbohydrate andLipid Metabolism Glucagon and Its Functions Effects on Glucose Metabolism Regulation of Glucagon Secretion Somatostatin Inhibits Glucagon and Insulin Secretion  |
| 12 | Diabetes Mellitus Type I Diabetes—Lack of Insulin Productionby Beta Cells of the Pancreas Type II Diabetes—Resistance to the Metabolic Effects of Insulin Physiology of Diagnosis of Diabetes Mellitus Treatment of Diabetes Insulinoma—Hyperinsulinism |
| 13 | Parathyroid Hormone, Calcitonin,Calcium and PhosphateOverview of Calcium and PhosphateRegulation in the Extracellular Fluid and PlasmaCalcium in the Plasma and Interstitial Fluid Absorption and Excretion of Calcium and Phosphate Bone and Its Relation to Extracellular Calcium and Phosphate Vitamin D Actions of Vitamin D Parathyroid Hormone Effect of Parathyroid Hormone on Calcium and Phosphate Concentrations in theExtracellular Fluid Control of Parathyroid Secretion by Calcium Ion Concentration Calcitonin  |
| 14 | Reproductive and Hormonal Functions of the Male (and Functionof the Pineal Gland) Physiologic Anatomy of the Male Sexual Organs Testosterone and Other Male Sex Hormones Secretion, Metabolism, and Chemistry of the Male Sex Hormone Functions of TestosteroneBasic Intracellular Mechanism of Action of TestosteroneControl of Male Sexual Functions byHormones from the Hypothalamus and Anterior Pituitary GlandPineal Gland—Its Function in ControllingSeasonal Fertility in Some Animals |
| 15 | Female Physiology Before Pregnancyand Female Hormones Physiologic Anatomy of the Female Sexual Organs Female Hormonal System Monthly Ovarian Cycle; Function of theGonadotropic Hormones Gonadotropic Hormones and Their Effects on the Ovaries Ovarian Follicle Growth—The “Follicular”Phase of the Ovarian Cycle Corpus Luteum—“Luteal” Phase of the Ovarian Cycle Functions of the Ovarian Hormones—Estradiol and Progesterone Feedback Oscillation of the Hypothalamic- Pituitary-Ovarian System  |