QUIMICA BIOLOGICA II

Programa teórico

Metabolismo del Hemo y enfermedades relacionadas

Biosíntesis del hemo, enzimas involucradas, propiedades y mecanismos de reacción. Regulación de la biosíntesis del hemo en células hepáticas y eritroideas. Catabolismo del hemo: rol de la Hemo oxigenasa y sus productos de reacción. Hemoproteinas. Control de los niveles intracelulares de hemo, transportadores. Efectos pleiotrópicos del hemo sobre diferentes eventos biológicos. Hemo como regulador de la homeostasis celular. Enfermedades relacionadas con el camino biosintético del Hemo: Porfirias. Biología Molecular y Farmacogenética de las Porfirias. Sistema metabolizante de drogas: Polimorfismos del citocromo P450 y su relación con el desencadenamiento de las porfirias.. Porfiria experimental: modelos farmacológicos y genéticos. El laboratorio de las porfirinas.

Cinética enzimática

Cinética del estado estacionario. Ecuación de Michaelis-Menten para un sustrato. Reacciones en la que intervienen de 2 ó más sustratos y productos. Mecanismos de reacción. Modelos de velocidades iniciales: intersectantes y paralelos. Estudios de inhibición: por producto, producto alterno, dead-end y sustrato. Estudios de intercambio isotópico. Gráficas obtenidas para los distintos mecanismos enzimáticos. Efecto del pH y la temperatura sobre la actividad enzimática. Predicción y validación de mecanismos de reacción.

Regulación de la actividad enzimática. Enzimas alostéricas: Modelos. Efectos Homotrópicos y Heterotrópicos. Cooperatividad positiva, negativa y mixta. Reactividad de la mitad de los sitios. Mecanismo Flip-Flop. Cooperatividad en enzimas monoméricas. Aplicación a casos reales. Significado fisiológico del comportamiento alostérico.

Cáncer

Bioquímica y biología de la célula tumoral. Angiogénesis. Invasión y metástasis. Oncogenes y genes supresores tumorales. Terapias anticancerígenos:

Quimioterapia, Bioterapia, Terapia fotodinámica. Nuevos tratamientos y perspectivas futuras. Proteómica: técnicas utilizadas y su aplicación en el diagnóstico y tratamiento del cáncer. Estrés oxidativo e inflamacion en el proceso tumoral.

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