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phenotype), or interfere with the transmembrane orientation of newly synthesized protein segments, can a

type-M. jannaschii SecYE?? and an extensivefl sequence-conservation analysis, we show that the closed stat

bonding interactions of numerous highlyfl conserved amino acids. Perturbations induced by mutation at var

type closed-statefl translocon, leading to displacement and increased hydration of the plug. ??fl 2010-Elsevie

Defectivefl Mutations””fl “field-volume”-18”fl “verb-file”fl “verb:home/jamesb/Documents/Mendel

-2010-fl-Dynamicsfl “verb-of-Sec-Y-Translocons-with-Translocation-Defective-Mutations.pdf:pdf”fl “endv

like environment, we have examined the molecularfl dynamics of wild-type and mutant GlpG in different me

bond interactions with lipids are paramount infl protein orientation and dynamics. Mutations in the unusual

Ser catalytic dyad. Similarly, mutations in TM5 change the dynamics andfl structure of the L1 loop. These re

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induced isomerization of the retinal from 11-c/s to all-transfl triggers changes in the conformation of visual-

c/s and all-trans retinal, and withfl two different force fields for describing the retinal molecule. The resultsf

site interactionsfl on the retinal force-field parameters highlights the coupling between thefl retinal molecu

Valadez, Bondar, Tobiasfl-fl “verb-2010--Coupling-of-retinal, protein, and water dynamics in squidfl rho

secretase, BACE, is a membrane-spanning aspartic protease, whichfl cleaves the amyloid precursor protein (

amyloid peptidefl (A β). Previous results have suggested that the regulation offl beta-

secretase and BACE access to APP is lipid dependent, and involves lipidfl rafts. Using the baculovirus expres

length BACE in insect cells and purified milligram amounts tofl homogeneity. We have studied partitioning

conjugated BACEfl between the liquid ordered and disordered phases in giant (10-150 μ m)fl unilamellar v

like, liquid ordered phase; the fraction associated with liquid orderedfl phase increased upon cross-

linking of raft lipids. To examine involvement offl individual lipid species in modulating BACE activity, we ha

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-2005-fl-Lipidfl “verb-s-as-modulators-of-proteolytic-activity-of-BACE-Involvement-offl-cholestefl “verb-r

secretase, thefl only other activity known to cleave type-I transmembrane domains. Rhomboidfl proteases r

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functionfl relationship, Trans-membrane-peptide”fl “strng-namehash”-JMMOG1”fl “strng-fullhash”-J

protein interactions isfl given with focus on the physical interactions between lipids and integralfl proteins in

INVESTIGATING THE RECOGNITION AND INTERACTIONS OF NON-POLAR α HELICES IN BIOLOGY

A THESIS SUBMITTED TO THE UNIVERSITY OF MANCHESTER
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE FACULTY OF LIFE SCIENCES

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James Baker

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