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that SGE, similarly to 1,25D, prompts a peak of S-phase followed by an arrest in the G0/G1-phase, events which were dependent on the MAP kinases ERK1/2, p38 and JNK. Significant differences of the data between control and treated conditions were analyzed by one way-ANOVA followed by Bonferroni test ($p<0.05$) or t-test (*$p<0.05$, **$p<0.01$). Taken together, these results suggest that SGE, as 1,25D, promotes myotube formation through Akt activation and regulates the cell cycle through ERK1/2, p38 and JNK.

Keywords: Cell Cycle, C2C12 cells, differentiation, vitamin D

BIOPHYSICS 2

(792) A HUMAN TRUNCATED α7 SUBUNIT CO-ASSEMBLES WITH THE FULL-LENGTH α7 TO FORM FUNCTIONAL NICOTINIC RECEPTORS

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The α7 nicotinic receptor subunit gene, *CHRNA7*, codes for a subunit that forms the homomeric α7 receptor, which is involved in learning and memory. In humans, exons 5-10 of *CHRNA7* were duplicated and fused to the *FAM7A* gene, given rise to the *CHRFAM7A* gene. The product of the resulting chimeric gene, dupα7, is a truncated subunit that lacks part of the ACh binding site. We here combined cell expression, confocal microscopy, western blot, and electrophysiological recordings in HEK cells to understand the functional role of the dupα7 subunit. We found that cells transfected with dupα7 cDNA express the dupα7 protein but show neither surface binding of an α7 specific antagonist nor agonist-elicited currents. To determine if dupα7 assembles with α7 into functional receptors, we used an α7 subunit carrying mutations in determinants of conductance (α7LC) as a reporter of receptor stoichiometry. Co-expression of α7LC with dupα7 or the reverse combination, α7 with dupα7LC, allowed detection of single-channel openings elicited by ACh, indicating that α7 and dupα7 subunits co-assemble into functional heteromeric receptors. The analysis revealed that a minimum of two α7 subunits is required for forming functional receptors and that activation of the heteromeric receptors occurs through the α7/α7 interface. Our results contribute to the understanding of the functional significance of the partial duplication of the α7 gene.

Keywords: nicotinic receptor, Patch-Clamp, ion channel, electrophysiology

(1108) EPIGALLOCATECHIN-3-GALLATE INCREASES THE AFFINITY FOR NA^+ IN THE NA,KATPASE

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The kinetics of formation and breakdown of the intermediates involved in the transport of Na^+ is one of the less studied aspects of the Na,K-ATPase reaction cycle. According to the Albers-Post model, binding of 3 intracellular Na^+ to the *E*1 state of the enzyme triggers phosphorylation by ATP in the presence of Mg^{2+} and Na^+ becomes occluded in the phosphorylated intermediate *E*1P. Na^+ is released to the extracellular medium after the *E*1P®*E*2P conformational transition. Occlusion of Na^+ has only been reported in inhibited enzyme, in the presence of oligomycin or Cr-ATP, and in partially proteolized enzyme.

The aim of the present work is to develop a procedure for measuring the kinetics of Na^+ occlusion in the Na,K-ATPase during the normal functioning of the reaction cycle. For this, states with occluded Na^+ need to be rapidly stabilized and isolated.

In this work, we propose to use epigallocatechin-3-gallate (EGCg) as a stabilizing agent (Ochiai et al., 2009, Biochem. Pharmacol., 78:1069-1074) and a rapid-filtration procedure to isolate the species with tightly bound Na^+.

Experiments were carried out at 25 °C in media with imidazole-HCl 25 mM, pH 7.4, using Na,K-ATPase partially purified from pig kidney. To evaluate the effects of EGCg on the affinity for Na^+, enzyme was incubated with eosin Y in a medium containing RbCl and different concentrations of NaCl and EGCg. The $K_{0.5}$ for Na^+ for the increment in eosin fluorescence decreased as [EGCg] increased. Measurements of tightly bound $^{22}Na^+$ to the Na,K-ATPase in the presence of 100 μM EGCg show that this increment in affinity for Na^+ is compatible with the stabilization of a state containing occluded Na^+. Addition of 100 μM EGCg to the washing solution is sufficient to "instantaneously freeze" the reactions of formation and breakdown of Na^+-bound states during the normal functioning of the reaction cycle.

Our results show that EGCg is a good stabilizing agent for characterizing the steps involved in the transport of Na^+.

Keywords: Na,KATPase, cation transport, Na^+ occlusion, epigallocatechin3gallate

(884) HTC1 AND HTC2, TWO *HALOMONAS TITANICAE* CHEMORECEPTORS THAT BIND AROMATIC COMPOUNDS

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Halomonas titanicae KHS3 is a strain isolated from Mar del Plata harbor that is able to grow on aromatic hydrocarbons and displays chemotactic behavior toward them.

Genomic sequencing allowed the identification of 25 chemoreceptor genes. Most of the genes code for proteins with a predicted periplasmic ligand-binding domain and a highly conserved cytoplasmic signaling domain. To identify those chemoreceptors involved in sensing of aromatic compounds, we first looked at their genomic context. We found one chemoreceptor, Htc1, next to genes related to degradation of aromatic compounds. The ligand-binding domain of this receptor was expressed in *E. coli* as a His-tagged protein. The purified protein was subjected to thermal shift assays. In this assay the Tm (melting temperature) of the protein is expected to increase in the presence of stabilizing ligands. Salicylate, 4-hydroxybenzoate and benzoate increased the Tm, among more than 300 compounds present in the screening plates. The binding was confirmed by thermophoresis assays. All three compounds bind to the periplasmic domain of Htc1 with Kds between 80 and 600 μM. Besides, the full-length receptor conferred the ability to control the flagellar movement in response to salicylate when expressed in *E coli*. An *Halomonas titanicae* Htc1 mutant, however, showed only subtle alterations in chemotaxis, suggesting that there is functional redundancy between *Ht* chemoreceptors.

Among other ligand binding domains from chemoreceptor genes that were subjected to thermal shift assays we found another one (Htc2) whose Tm was also increased with salicylate, as well as with malate, malonate and succinate. The binding properties were characterized using isothermal calorimetry (ITC). The C3-C4 dicarboxylic acids bound with high affinities (Kds between 30 and 600 μM), whereas salicylate binds poorly (Kd about 2.5 mM). Full-length cloning and expression for functional characterization in *E.coli* cells and mutant construction are under way.

Keywords: Chemotaxis, Chemoreceptors, aromatic compounds

(1258) PRELIMINARY FUNCTIONAL CHARACTERIZATION OF A CALCIUM-SENSING RECEPTOR- POLYCYSTIN-2 CHANNEL COMPLEX IN THE PLASMA MEMBRANE OF LLC-PK1 CELLS.

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Polycystin-2 (PC2, TRPP2) is a Ca^{2+}-permeable nonselective cation channel from the Transient Receptor Potential (TRP) superfamily of cation channels. PC2 is encoded by the PKD2 gene, whose mutations are responsible for autosomal dominant polycystic kidney disease (ADPKD). PC2 has been detected in different cellular loca-