THE EXPRESSION OF G-PROTEIN COUPLED RECEPTOR-64 IN MICE DORSAL ROOT GANGLIA. ***Phillip P. Nguyen and Mark Ledoux***, *Christian Brothers University, Memphis, Tennessee, and University of Tennessee Health Science Center, Memphis, Tennessee.* In order to better our understandings of neuropathy, we need to pay a close attention to the specific genes that manifested in a particular disease. According to a previous study by LeDoux and colleagues, a significant expression of G-protein coupled receptor-64 was identified in mice dorsal root ganglia. This led to the present study, which focused on comparing the expression of the G-protein coupled receptor-64 in type A and type B ganglion cells. The type A cell is larger and gives rise to Aα and Aβ fibers, while the type B cell is smaller and gives rise to Aδ and C fibers. Mice were perfused with saline followed by paraformaldehyde, and the spinal cord was removed and placed in sucrose solution. Ganglia were collected and sectioned at10-μm using a cryostat. Immuno-staining was used to identify the protein expression on the two cell types. The results suggested that type B ganglion cells have a higher protein expression than type A ganglion cells.

ROLE OF NHERF-1 IN OK CELLS. ***Indrani Biswas and Judith Cole***, *Christian Brothers University, Memphis, Tennessee, and University of Memphis, Memphis, Tennessee.* Opossum kidney (OK) cells are researched often for kidney functionality, such as sodium dependent phosphate transport (Na/PO_4). The two clonal subpopulations of opossum kidney (OK) cells, OK-H, and TN-H, were derived from the parental OK cell line. The clonal subpopulations were treated with parathyroid hormone (PTH) determining the role of a scaffolding protein, Na^+/H^+ exchange regulatory factor-1 (NHERF-1) upon the apical brush border of OK cells. The clonal subpopulations display a heterogeneous distribution of microvilli on brush border. A lack of NHERF-1 in OK cells does not affect the distribution, nor show any differences of microvilli. The functional differences of microvilli due to NHERF-1 are unsure, although in OK/H cells, PTH does not signal through phospholipase c (PLC) nor regulate Na/PO_4. PTH does activate PLC and inhibit Na/PO_4 in wild type cells, and TN-H with NHERF-1 restores PTH responsiveness. NHERF-1 should provide further useful studies for PTH regulation Na/PO_4 transport.

WATER QUALITY IN CYPRESS CREEK: AN INORGANIC ANALYSIS. ***LeAnedra Crowell, Daniel Larsen, and Delphia F. Harris***, *LeMoyne-Owen College, Memphis, Tennessee (LC, DFH), and University of Memphis, Memphis, Tennessee (DL).* Cypress Creek is listed as an impaired waterway by the United States Environmental Protection Agency (EPA). Historically, Cypress Creek suffered major contamination from industrial processing and discharge. High concentrations of pesticides and pesticide residues have been measured in Cypress Creek (water and sediment) and in soil in the flood plain surrounding the Creek. Cypress Creek is a tributary to the Wolf River which is also on the EPA list of impaired waterways. The Wolf River empties into the Mississippi River. Within the Memphis City limits there are gaps in the clay structure that create recharge zones for the Memphis Aquifer. This adds significance to the quality of surface water due to its possible connection with the groundwater. Drinking water in Memphis and the MidSouth is pumped from the Memphis Aquifer. The ascorbic acid method was used alone to spectrophotometrically determine the concentration of phosphate in the creek water. Metals are analyzed using direct absorption atomic absorption spectrophotometry. Results are compared for samples collected during dry periods and rainy conditions.

MAINTENANCE OF BETA ADRENERGIC RECEPTOR SIGNALING IN HUMAN MICROVASCULAR RETINAL ENDOTHELIAL CELLS. ***Kimberly Williams and Jena J. Steinle***, *Christian Brothers University, Memphis, Tennessee, and University of Tennessee Health Science Center, Memphis, Tennessee.* This study was designed to investigate beta-adrenergic receptor regulation of Fas signaling in human retinal endothelial cells. Cells were grown in high glucose medium until confluent, serum starved for 18–24 hours, followed by treatment with a beta-1-adrenergic receptor agonist, xamoterol. Cell culture lysates were collected at 15, 30, and 45 minutes after stimulation, along with not-treated controls. Western blot and ELISA analyses were completed. Fas ligand was significantly decreased levels following 15 and 30 minutes stimulation; Fas receptor decreased at all time points. The ratio of phosphorylated FADD to total FADD protein was significantly decreased at 30 minutes. Cleaved caspase-8 levels decreased significantly at all times, while cleaved caspase-3 was significantly decreased at 45 minutes. These results suggest that beta-adrenergic receptors regulate the Fas ligand-Fas signaling cascade to reduce apoptosis in human retinal endothelial cells. This study indicated that maintaining beta-adrenergic signaling in diabetes may be protective for the retina.

MONOCYTE RESPONSE IN OSTEOLYSIS AND POSSIBLE PREDISPOSITION TO THE DISEASE. ***Brian Walter and Richard Smith***, *Christian Brothers University, Memphis, Tennessee, and University of Tennessee, Memphis, Tennessee.* Peri-implant osteolysis is a disease process characterized by bone loss around orthopedic implants. The disease process is mediated by macrophages. These cells normally take up the particles generated as the implant wears. These macrophages may be stimulated by the wear debris to secrete inflammatory cytokines, thus inducing osteolysis. Our hypothesis is that bacterial endotoxins may play a role in activating these macrophages. Our goal is to determine the macrophage response to wear debris in cells from normal volunteers and patients with and without periprosthetic osteolysis and the association of the magnitude of the response or the incidence of the disease with particular TLR4, CD14, and TLR2 polymorphisms. Our preliminary results indicate that macrophage response showed variation between the groups and SNP analysis showed evidence of genetic variation within donors. Although it is too preliminary to determine if the gene polymorphisms examined are associated with the degree or occurrence of osteolysis.

MACULAR PIGMENT OPTICAL DENSITY'S ROLE IN MACULAR PHYSIOLOGY AND DISEASE. ***Jeremy T. Armstrong and Alessandro Iannaccone***, *Christian Brothers University, Memphis, Tennessee, and University of Tennessee Health Science Center, Memphis, Tennessee.* Our purpose was to investigate the relationship between macular pigment optical density (MPOD), C-reactive protein (CRP), serum lutein and zeaxanthin (L&Z) levels, and variants in the complement factor H (*CFH*) gene, and to conduct a pilot study on the effect of MPOD augmentation on macular function. MPOD was correlated to both serum L&Z and serum CRP, and serum L&Z and CRP were inversely correlated, but relationships were complex and not linear. No significant correlations were observed between *CFH* variants and

either MPOD or CRP. Following L&Z supplementation, a significant MPOD increase was accompanied by improved pattern electroretinogram amplitude and increased dark-adapted cone sensitivity. Studies on MPOD, and serum L&Z or CRP will show different degrees of correlation depending on their ranges within the examined population samples. Harboring pro-inflammatory *CFH* variants does not correlate with high CRP or low MPOD. MPOD augmentation following L&Z supplementation is associated with improved macular function.

EXAMINE THE EFFECTS OF POST-REHABILITATION TELEPHONE FOLLOW-UP ON PATIENT COMPLIANCE. ***Chen Edri***, *University of Memphis, Memphis, Tennessee*. The study examined discharged physical therapy patients' compliance to their Home Exercise Program under the supervision of a telephone follow-up system. Twenty-six subjects were collected, given an initial interview, and randomly assigned to either a control group or a follow-up group. The follow-up group was interviewed bi-weekly for a period of three months, whereas the control group was left aside without contact. Both groups completed a terminal interview at the end of the three-month period and the data was analyzed to determine the significance of the follow-up.

ADHERENCE RATES IN ADOLESCENTS PRESCRIBED HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART). ***Michael Herr, Gabriela Maron, Aditya Gaur, Wally Bitar, and Pat Flynn***, *Christian Brothers University, Memphis, Tennessee (MH);and St. Jude Children's Research Hospital (SJCRH), Memphis, Tennessee (GM, AG, WB, PF)*. Adolescents are the fastest growing group of new HIV infections in the US. It is important to determine how dosing frequency can influence adolescents' adherence to HAART. The objective was to compare adherence and outcome of therapy at 24 weeks in adolescents receiving once a day (QD) or twice a day (BID) regimens. Records of patients, ages 13 to 24, receiving QD or BID regimens were reviewed for self-reported adherence, socioeconomic barriers and viral load at 24 weeks. Logistic regression was used to determine relationships between predictor and outcome variables. Seventy-eight patients were included. QD regimen and living with family were predictors for ≥ 95% adherence. Male gender and ≥ 95% adherence by self report were predictors for undetectable viral load at week 24. Adolescents on QD regimen are more likely to report ≥ 95% adherence than those on BID regimens. Self report ≥ 95% is a predictor for undetectable viral load. Adherence to HARRT in adolescents can improve by decreasing dosage frequency.

CHARACTERIZATION OF SEPTATION MUTANTS IN *ASPERGILLUS NIDULANS*. ***Frances Benoist, Sara Gremillion, Darlene Loprete, and Terry Hill***, *Rhodes College, Memphis, Tennessee*. We have identified a series of six mutant strains of the fungus *Aspergillus nidulans*, which lack crosswalls (septa) when grown at the restrictive temperature of 42°C and which exhibit elevated sensitivity to the cell wall compromising agent Calcofluor White (CFW). Under these conditions, germlings fail to grow beyond the germ tube stage of development, due to rupture of hyphal tips and uncontrolled spillage of cytoplasm. We conducted allelism tests of these mutations in order to identify how many mutant loci are involved. Results showed that the mutation in strain RCH-49 occurs in the same locus as the mutation in strain R-274. The mutations in strains RCH-2, RCH-59, RCH-66 and RCH-83 occur at independent loci. Thus, five independent loci were found to be mutated in six strains tested. This result indicates that this screening strategy for septation mutants is not yet fully saturated.

GENETIC INTERACTIONS BETWEEN THE G1 CYCLIN *CLN3* AND *THI73* MAY LINK THE ENDOPLASMIC RETICULUM TO REGULATED CELL DIVISION. ***Jacquelyn G. Hancock and Mary E. Miller***, *Rhodes College, Memphis, Tennessee*. The G1 cyclin, Cln3, is a regulatory protein that coordinates cell division by activating the cyclin-dependent kinase, Cdc28. In order for the Cln3/Cdc28 complex to regulate commitment to cell division, it must be released from the endoplasmic reticulum (located in the cytoplasm of the cell) and moved into the nucleus. Once in the nucleus, the complex activates a transcriptional program functionally homologous to the Retinoblastoma pathway in mammalian cells. To understand how Cln3 movement is regulated, a genetic screen utilizing a reporter that consists of the Cln3 nuclear localization signal (NLS) fused to green fluorescent protein identified *THI73* as important for Cln3 NLS function. While the exact function of *THI73* is unknown, it thought to be localized to the ER and is induced in response to low vitamin B concentrations. We find that Cln3-dependent viability is reduced in the absence of *THI73* most likely due to a defect in localization of Cln3. To further understand the mechanism that links Cln3 dependent cell division and Thi73 activity, a high-copy suppression analysis of the Cln3-dependent growth defect in a Thi73 deletion strain is in progress.

PURIFICATION OF LAMPREY MANNOSE-BINDING LECTIN AND BINDING TO *AEROMONAS SALMONICIDA*. ***Wendy M. Rose and Donald D. Ourth***, *University of Memphis, Memphis, Tennessee*. Mannose-binding C-type lectin (MBL) was isolated by affinity chromatography from sea lamprey (*Petromyzon marinus*) plasma. The affinity-purified and 2-ME reduced lamprey MBL showed two bands of 35 kDa and 65 kDa by SDS-PAGE and Western blotting using guinea pig anti-MBL IgG as the primary antibody. The lamprey MBL binds to mannose on the surface of the pathogen *Aeromonas salmonicida*. The presence of MBL in high concentration in lamprey plasma could be important in their innate immunity and resistance to infection. This study describes the presence of MBL in sea lamprey plasma and evidence for a C-type lectin complement pathway of innate immunity.