that this receptor along with other known receptors, found on the enterodectin-1 L-cells, are potential therapeutic targets for treating type 2 diabetes, for example, through drugs that can increase the release of GLP-1 by activating these receptors to mimic the high postprandial GLP-1 levels observed in diabetic surgery patients, which is thought to be responsible for the essentially immediate diabetes remission for majority of patients. A major advantage of targeting these lumen facing receptors is that potential drug molecules do not need to enter the systemic circulation for a therapeutic benefit, potentially minimizing their side effects.

**Sa1834**

**Long Noncoding RNA PTENP1 Competes With miR-29b to Regulate JAM-A Expression and Intestinal Epithelial Barrier Function**

Lan Xiao, Rao N. Jalaludini, Jing Wu, Myraa Gorospe, Jian-Ying Wang

Gut epithelial barrier protects the subepithelial tissue against a wide array of noxious substances in the lumen, and its integrity and normal function depend on specialized structures composing different intestinal junctions including tight junctions (TJs). The constituent complexes of TJs undergo continuous remodeling and turnover, but the exact mechanism underlying this process remains to be fully investigated. MicroRNAs (miRNAs) and long noncoding RNAs (lncRNAs) regulate expression of different genes and are involved in many aspects of cellular functions. Unlike miRNAs that function as post-transcriptional repressors for target mRNAs, the exact biological functions of lncRNAs and their mechanisms remain largely unknown, especially in maintenance of the gut epithelial integrity and barrier function. In this study, we determined the role of the lncRNA PTENP1 in the regulation of TJ expression and further examined its interaction with miRNA-29b (miR-29b). Methods: Studies were conducted in Caco-2 cells, and expression of PTENP1 and miR-29b were determined by real-time quantitative (q) PCR and fluorescent in situ hybridization (FISH) assays. Loss- of- and gain-of-functions of PTENP1 and miR-29b were completed by transfection with the specific PTENP1 antisense (anti-PTENP1) or anti-miR-29b oligonucleotides (anti- miR-29b) and by ectopic overexpression of the PTENP1 gene or miR-29b precursor (pre-miR-29b). The barrier function was examined by transepithelial electrical resistance (TEER) and paracellular tracer flux assay using fluorescent dextran. Results: PTENP1 was distributed in both the nucleus and cytoplasm but miR-29b was predominantly located at the cytoplasm as measured by FISH assays. PTENP1 silencing by transfection with siPTENP1 decreased the expression levels of JAMA (by -85%), although it failed to alter expression of TJs ZO-1 and ZO-2. Decreased levels of JAMA by PTENP1 silencing compromised the barrier function, indicated by decrease in TEER values and an increase in the levels of paracellular flux of dextran. In contrast, ectopic PTENP1overexpression induced JAMA expression and enhanced the epithelial barrier function. On the other hand, ectopically expressed miR-29b by transfection with pre-miR-29b decreased JAMA protein levels and disrupted epithelial barrier function. miR-29b directly bound to the JAMA mRNA and repressed its translation without effect on total JAMA mRNA levels. Interestingly, PTENP1 could function as a sponge antagonist of miR-29b, since it associated with miR-29b as measured by biotinylated miR-29b pull-down assays. Conclusion: These results indicate that 1) PTENP1 is a novel enhancer of JAMA expression, 2) miR-29b inhibits JAMA translation, and 3) interaction between PTENP1 and miR-29b plays an important role in the regulation of JAMA expression and epithelial barrier function.

**Sa1835**

**Effect of Dietary Lipid, Fiber Type, and Particle Size on the Gastrointestinal Endocrine Function and Nutrient Utilization in Growing Pigs**

Milena Saqui-Salces, Zhaohei Luo, Brian J. Kerr, Pedro E. Urriola, Gerald C. Shurson

Dietary lipid and fiber play an important role on gastrointestinal (GI) endocrine function. In addition to diet composition (DC), particle size (PS) has been suggested to be an important factor affecting nutrient digestibility and GI function. To determine the role of insoluble (corn cholesterol drums with solubles) or soluble dietary fiber (soybean hulls) sources on GI endocrine function, we fed growing pigs diets of different composition that were fine (corn dried distillers grains with solubles) or soluble dietary fiber (soybean hulls) sources. Methods: Studies were conducted in Caco-2 cells, and expression of PTENP1 and miR-29b were determined by real-time quantitative (q) PCR and fluorescent in situ hybridization (FISH) assays. Loss- of- and gain-of-functions of PTENP1 and miR-29b were completed by transfection with the specific PTENP1 antisense (anti-PTENP1) or anti-miR-29b oligonucleotides (anti- miR-29b) and by ectopic overexpression of the PTENP1 gene or miR-29b precursor (pre-miR-29b). The barrier function was examined by transepithelial electrical resistance (TEER) and paracellular tracer flux assay using fluorescent dextran. Results: PTENP1 was distributed in both the nucleus and cytoplasm but miR-29b was predominantly located at the cytoplasm as measured by FISH assays. PTENP1 silencing by transfection with siPTENP1 decreased the expression levels of JAMA (by -85%), although it failed to alter expression of TJs ZO-1 and ZO-2. Decreased levels of JAMA by PTENP1 silencing compromised the barrier function, indicated by decrease in TEER values and an increase in the levels of paracellular flux of dextran. In contrast, ectopic PTENP1overexpression induced JAMA expression and enhanced the epithelial barrier function. On the other hand, ectopically expressed miR-29b by transfection with pre-miR-29b decreased JAMA protein levels and disrupted epithelial barrier function. miR-29b directly bound to the JAMA mRNA and repressed its translation without effect on total JAMA mRNA levels. Interestingly, PTENP1 could function as a sponge antagonist of miR-29b, since it associated with miR-29b as measured by biotinylated miR-29b pull-down assays. Conclusion: These results indicate that 1) PTENP1 is a novel enhancer of JAMA expression, 2) miR-29b inhibits JAMA translation, and 3) interaction between PTENP1 and miR-29b plays an important role in the regulation of JAMA expression and epithelial barrier function.

**Sa1836**

**Impact of High-Fiber Diets of Different Fermentability on Intestinal Cell Differentiation**

Milena Saqui-Salces, Zhihun Huang, Pedro E. Urriola, Gerald C. Shurson

High-fiber diets are prescribed as lifestyle strategies to patients to reduce the incidence or severity of gastrointestinal (GI) inflammatory diseases. Long-term feeding of high fiber diets increases villus height, goblet cell number, epithelial cell proliferation, and cell turnover rate. Studies of the effect of fiber on the intestinal epithelium have used purified fiber sources that do not model the effect of common dietary fiber. We observed that the beneficial and adverse effects of different fiber sources are different from those of isolated fiber, i.e., the former may be different from fiber that is extraneous to the gut, but not from goblet cells. We hypothesized that high fiber diets modulate the intestinal epithelial differentiation signaling favoring the development of secretory cells at the expense of absorptive cells. We analyzed the changes in proliferation, Notch and Wnt signaling induced by diets including fiber sources with different fermentability. Procedures were approved by the University of Minnesota Institutional Animal Care and Use Committee. Wheat straw (WS), corn dried distillers grains with solubles (DDGS), and soybean hulls (SBH) were evaluated as fiber sources that were different (23%, 5% and 30% respectively) to the highly-soluble- and highly-soluble but indigestible cell wall fractions. We used double- and single-switch feedings, respectively. Procedures were approved by the University of Minnesota Institutional Animal Care and Use Committee.

**Sa1878**

**Metabolic Syndrome and the Risk of Barrett's Esophagus in White Males**

Aaron P. Thrift, Jonathan Hilal, Hashem B. El-Serag

Background & Aims: Few studies have examined the association between metabolic syndrome and the risk of Barrett's esophagus (BE). Whether metabolic syndrome confers a greater risk than the sum of its components is unknown. We investigated associations between metabolic syndrome and the risk of BE in White Males. Methods: We conducted a case-control study among eligible symptomatic patients scheduled for elective esophageal gastroduodenoscopy and a sample of patients eligible for screening colonoscopy recruited at participating primary care clinics. Metabolic syndrome was defined as the presence of at least three of: high waist-to-hip (WHR) ratio, hypertriglyceridemia, low high-density lipoprotein (HDL) cholesterol, hypertension, or diabetes. We used multivariate logistic regression to calculate adjusted odds ratios (OR) and 95% confidence intervals (95%CI). Results: There were 244 BE cases, 209 colonoscopy controls and 615 endoscopy controls. Comparing BE cases with the combined control group, metabolic syndrome was statistically significantly associated with BE risk (OR=1.59, 95%CI 1.02-2.40) and there was a dose effect increasing metabolic syndrome components (P trend < 0.001); when all 5 components were present, the OR was 2.61 (95%CI 1.14-5.99). We found that among those with metabolic syndrome, high WHR, hypertriglyceridemia, high HDL, and diabetes were associated with increased risk of BE, whereas lowered HDL cholesterol was associated with lower risk of BE. When we compared cases with the control groups separately, metabolic syndrome was associated with BE for comparisons with endoscopy controls (OR=1.67, 95%CI 1.02-2.53) but not colonoscopy controls (OR=0.87, 95%CI 0.49-1.54). Associations with the individual components of metabolic syndrome also depended on the comparison group. Conclusions: Metabolic syndrome may be associated with BE in persons undergoing endoscopy. However, not all components of metabolic syndrome contribute to risk equally or in the same direction.