confirm differences in gene expression. We found that hepatic gene expression (fold ± SEM) of Gamma-Butyrobetaine Hydroxylase 1 (*Bbox1*) was higher in vehicle-treated animals (1 ± 0.60) compared to dieldrin-treated animals (0.29 ± 0.12). *Bbox1* catalyzes the last step in the L-carnitine biosynthetic pathway, which is necessary for mitochondrial beta-oxidation. Dieldrin-induced reduction in L-carnitine production may be a critical factor in adult reproductive function. Further, Protein-L-Isoaspartate (D-Aspartate) O-Methyltransferase Domain Containing Protein 1 (*Pcmtd1*) was higher (1± 0.76) in vehicle-treated animals compared to dieldrin-treated animals (0.13 ± 0.044), and DENN Domain Containing 5B (*Dennd5b*) was also found to be higher in vehicle-treated (1 ± 0.39) compared to dieldrin-treated (0.28 ± 0.10) turtles. We found that dieldrin exposure did not alter gene expression of Cytochrome p450 1a (*Cyp1a*) a marker of aryl hydrocarbon receptor signaling, or Vitellogenin 2 (*Vtg2*) a marker of estrogen signaling. In our RNAseq analysis we unexpectedly discovered a *hepacivirus* infecting *T. scripta*. In the dieldrin-treated group, we used QPCR to examine gene expression of potential markers of *hepacivirus* infection. Neither Interleukin 1 Beta (*Il-1*β), SMAD Family Member 6 (*Smad6*), C-C Motif Chemokine Ligand 5 (*Ccl5*), or TNF Receptor Superfamily Member 9 (*Tnfrsf9*) was found to differ in turtles carrying the virus, compared to non-infected animals. In conclusion, we found that developmental dieldrin exposure of *T. scripta* slightly reduces neonatal expression of several gene transcripts which may be correlated to adult reproductive fitness.

Adrenal

ADRENAL CASE REPORTS II

Using Chromogranin A to Unmask the Great Masquerader: A Case Reportof a Minimally Symptomatic Pheochromocytoma

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SUN-LB35

Introduction/Background: Pheochromocytomas are rare neoplasms, occurring in less than 0.2% of the population. The classic triad of symptoms includes hypertension, headaches and sweating. An increasing number of patients with pheochromocytomas that are diagnosed at a pre-symptomatic stage.***Clinical Case*** A 69 yo male being worked up for hematuria and possible bladder cancer was referred to endocrinology due to a 3 cm x 3 cm right adrenal "incidentaloma." The mass was noted to be heterogeneously enhancing on CT adrenal protocol, suggesting pheochromocytoma, adrenal carcinoma or metastasis. He endorsed no clinical symptoms of hormone excess and blood pressure was controlled HCTZ. He was found to have elevated serum metanephrines (184 pg/mL, nl <57) and noremetanephrine (608 pg/dL, nl <148) and total metanephrines (792 pg/dL, nl <205). Other hormonal determinations were normal including cortisol (9AM, 8.97 ug/dL, nl 3-22), DHEAS 66 mcg/dL (25-240), estradiol 23 pg/mL (<39), 17 OHD 60 ng/dL, ACTH 37 (6-50), free testosterone 43.6, total testosterone 396, androstenedione 63 (20-220). Further testing revealed 24 hour urine metanephrine and catecholeamines; urinary metanehrine 2025, noremetanephrine 1729, total 2442 and epinephrine 48, norepinephrine 336 and dopamine 112 which were 2-3 times the upper limit of normal. Because the patient consumed significant amount of caffeine (10 cups of coffee and cola daily), these studies were repeated after caffeine washout. Repeat serum testing revealed metanephrine at the upper limit of normal (metanephrine 47, noremetanphrine 146, respectively). Chromogranin A levels were elevated before (626 units) and after PPI discontinuation, (539 units, nl 25-140). Given the biochemical results and size of mass, he was referred him surgical resection. He was treated pre-operatively with doxazosin and underwent an uncomplicated right adrenalectomy via posterior right retroperitoneoscopic. Pathology was consistent with pheochromocytoma without capsular invasion. Immunohistochemical stains were characteristic of pheochromocytoma, positive for synaptophysin, chromogranin, and S100 but negative for Cytokeratin AE1/AE3 and calretinin. ***Conclusion:*** We present the case of a patient with a clinically asymptomatic pheochromocytoma. The diagnosis was supported by elevations in chromogranin and catecholamine metabolites, although the latter results were mixed and clouded by potential confounding factors such as heavy caffeine intake. The case demonstrates that with early detection, screening should include patients with no symptoms and otherwise low risk of disease. Decisions on surgical resection should be based on clinical suspicion, symptoms, imaging, tumor size and biochemical findings given the aggressive nature of these tumors and their malignant potential.

Steroid Hormones and Receptors

STEROID BIOLOGY AND ACTION

The LncRNA Growth Arrest Specific 5 Regulates Cell Survival via Distinct Structural Modules With Independent Functions

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SAT-LB138

The growth arrest-specific 5 (*gas5*) gene encodes a long non-coding RNA (lncRNA) that is required for normal growth arrest, slows down the cell cycle, controls apoptosis, and is required for the inhibition of cell growth by mTOR inhibitors such as rapamycin. In agreement with this role in regulating cell proliferation, Gas5 expression is reduced and acts as a tumor suppressor in numerous cancers, including B-cell lymphoma and leukemia. At its 3' terminal end (nucleotides 546-566) Gas5 contains a predicted stem-loop structure that specifically interacts with steroid receptors (SRs) and blocks DNA-dependent steroid signalling. In steroid-sensitive cancer cells such as prostate cancers this SR binding motif is responsible for Gas5 effects on cell growth. This is not true in other cell types, however, where proliferation is not strongly dependent on SR signaling (e.g. leukemic T cells). Therefore, other regions in

Gas5 must be active and use different mechanisms to regulate cell survival. We have used SHAPE chemical probing to analyze the secondary structure of Gas5 *in vitro* and *in cellulo*. We find that the secondary structure of endogenous Gas5 resembles that of *in vitro* transcribed Gas5 RNA. The molecule contains three separate structural modules: a 5' module with low secondary structure content, a highly structured core module, and the SR binding module, which forms separate from the rest of the molecule close to its 3' end. Functional studies in leukemic T cells show that the 5' module mediates Gas5's role in inhibiting basal cell survival and slowing the cell cycle, whereas the core module is required for mediating the effects of mTOR inhibition. These results confirm that the Gas5 structural modules function independently in cells and each module acts under different cellular conditions, likely using different molecular mechanisms. RNA pull-downs from cell lysates using the identified modules and full-length RNA identified proteins preferentially associated with each module. Proteins preferentially associated with the 5' terminal region are enriched in splicing and RNA processing factors. The structured central region preferentially interacts with proteins involved in chromosome organization such as the SWI/SNF family of nucleosome remodeling complexes.

Tumor Biology

TUMOR BIOLOGY: GENERAL, TUMORIGENESIS, PROGRESSION, AND METASTASIS

A Dual Role for IGF-1R in Mammary Tumorigenesis

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SAT-LB26

The insulin-like growth factor type 1 receptor (IGF-1R) is now thought to have a dual function in breast cancer. Several studies have shown overexpression of the IGF-1R pathway results in increased tumor cell proliferation and survival. Recent loss-of-function models have shown decreased mammary tumorigenesis latency and increased metastasis. These recent studies correlate with analyses of human patient datasets identifying worse overall survival with low IGF-1R expression. Similarly, inhibition of IGF-1R in the clinic has had no affect or has led to worse outcomes supporting the hypothesis that the IGF-1R may have tumor suppressive properties. Our prior published studies revealed loss of IGF-1R function results in heightened tumor epithelial stress, which alters the tumor microenvironment to be permissive for metastasis. Therefore, we asked does the loss of IGF-1R inherently change the tumor epithelium or is it simply the alterations of the microenvironment that lead to a metastatic primary tumor? We first analyzed cell invasion of primary tumor epithelial cells from a mouse tumor model driven by the Wnt1 oncogene (MMTV-Wnt1) and with reduced IGF-1R signaling by expression of a dominant-negative transgene (MMTV-dnIGF-1R). Epithelial cells from the MMTV-Wnt1/dnIGF-1R (bigenic) tumors invaded at the same rate as MMTV-Wnt1 tumor epithelial cells by tail vein injection suggesting invasive capacity is unchanged with reduced IGF-1R signaling. Interestingly, size of lung micrometastases from tail vein injected bigenic tumor epithelial cells was significantly reduced and the number also decreased over time in part due to a proliferative defect determined by immunostaining for pH3. Similarly, bigenic primary tumor epithelial cells injected into the mammary gland fat pad failed to form tumors suggesting alterations in cell adhesion. Consistent with this observation, E-cadherin gene and protein expression were decreased in the bigenic tumor epithelium compared to MMTV-Wnt1 tumors. *In vitro* analysis of cell adhesion in MMTV-Wnt1 primary epithelial cells resulted in both $K8^+$ (luminal) and $K14^+$ (basal) tumor epithelial cells adherence, while only $K14^+$ cells from bigenic tumors adhered to collagen. Similarly, the lung micrometastases from tail vein injections exhibited predominantly K14+ cells. Analysis of MMTV-Wnt1 and bigenic primary tumors using single cell RNAseq revealed alterations in both stromal and epithelial populations that may contribute to bigenic primary tumor growth and metastasis. These data support the conclusion that inhibiting IGF-1R signaling results in both alterations to the tumor epithelium (partial EMT) and microenvironment that result in metastasis, but also, that the IGF-1R deficient metastatic cells need a niche or paracine signaling to proliferate.

Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS II

A Benign and Favorable Diagnosis: Glycogen Hepatopathy Causing Transient Transaminitis During Diabetic Ketoacidosis in Type 1 Diabetes Mellitus

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MON-LB126

Background: Transient transaminitis is a rarely discussed complication of uncontrolled diabetes mellitus (DM). Known as glycogenic hepatopathy (GH), it is belived to be caused by build-up of glycogen in hepatocytes. Recognized as benign and reversible, GH is associated with hepatomegaly (>90% cases) and primarily seen in patients with type 1 DM during periods of inadequate hyperglycemic control. Differential diagnoses include glycogen storage diseases, nonalcoholic fatty liver disease, hepatosclerosis, autoimmune hepatitis, hemochromatosis, Wilson disease, and acute viral hepatitis.[1]

Case Report: A 26-year-old African American female with type 1 DM and sickle cell presented on multiple occasions to the emergency department with abdominal pain associated with nausea, vomiting and diarrhea. Initial labs consistently included glucose levels >600 mg/dL (70-105 mg/dL), elevated anion gap ranging 20-40s mEq/L (5-15 mEq), and severe metabolic acidosis reflective of diabetic ketoacidosis (DKA). Labs were also significant for repeated mild transaminitis despite adequate fluid hydration.

After several admissions, we observed a distinct pattern of mild transaminitis that directly fluctuated with her levels of blood glucose. With some minor lag, the patient's liver