

Introduction

- Approximately 50% of pediatric patients in the U.S. have vitamin D deficiency.
- Obesity and vitamin D deficiency are uniquely associated with hypertension, elevated fasting glucoses, and increased risk of metabolic syndrome.
- Increasing prevalence of pediatric obesity correlates with many more children with low 25OHD levels.
- 25OHD levels correlate with other physiological markers of vitamin D effects in lean individuals but not obese individuals.
- Obese patients with low 25OHD commonly have no improvement in levels despite high doses of vitamin D treatment.

Is measuring a storage form of vitamin D in these individuals a true reflection of vitamin D action in the body?

Significance: Provide foundational knowledge to understand if expression of Vitamin D Receptor (VDR)-target genes may be used as reference standard for vitamin D status in body

Hypothesis: VDR-target gene expression in obese individuals will:

1. Correlate with each other in subcutaneous adipose tissue.
2. Will not correlate with circulating vitamin D levels.

Methods

- **Study Description:** Secondary analysis of patients that underwent bariatric surgery from 2004 to 2019 at Texas Children's Hospital under a previously consented protocol.
- **Eligibility Criteria:** Obese adolescents ages 13-18 years old that underwent bariatric surgery at TCH.
- **Data Collection:** age at time of surgery, gender, race/ethnicity, BMI, 20 mL blood sample during surgery, and subcutaneous adipose tissue sample collected during surgery.
- **Tissue Analysis:** RT-PCR for levels of VDR-target gene expression that will be normalized to average of 2 housekeeping genes (Table 1).

Methods

	Adipose Tissue
<u>Housekeeping genes</u>	
GAPDH	X
RPLP0	X
<u>VDR-target genes</u>	
VDR	X
CYP24A1	X
PPAR γ	X
TLR4	X
THBD	X

Table 1. Genes Chosen for Analysis

Results

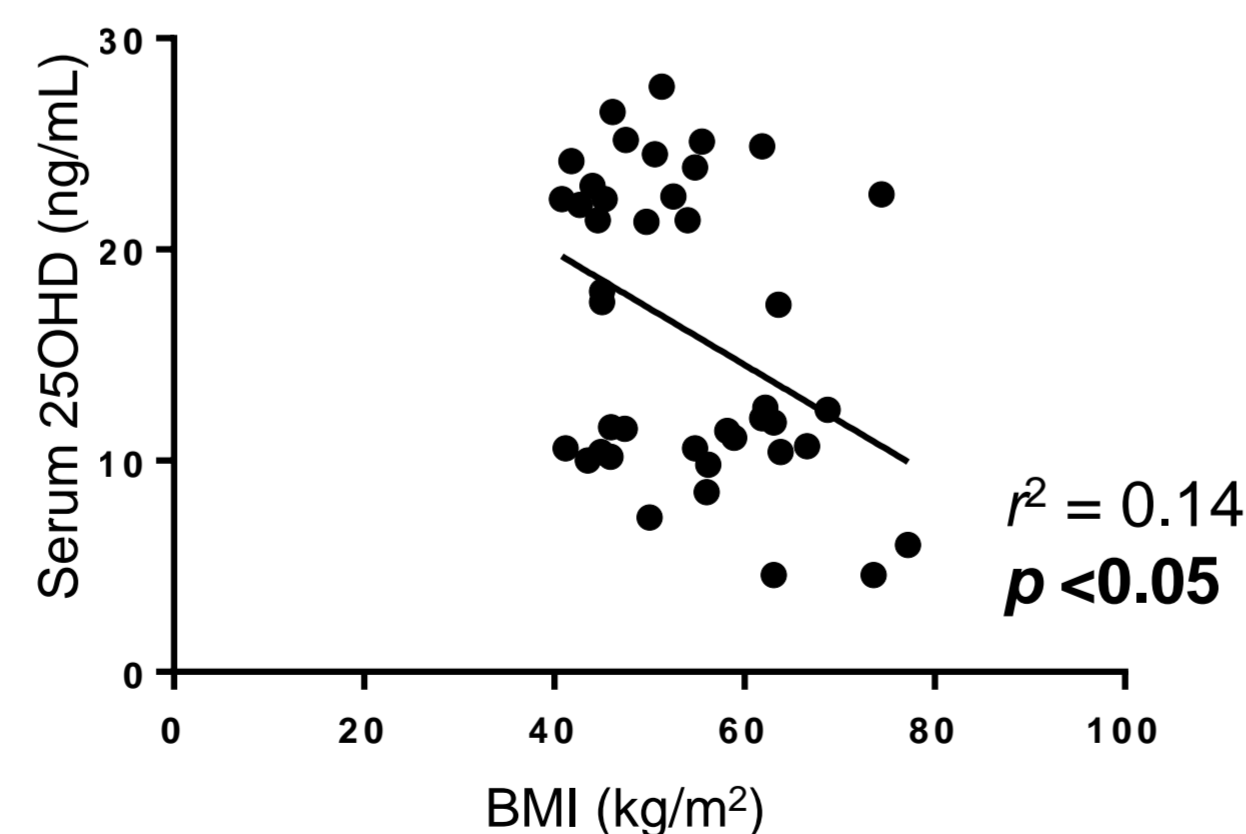
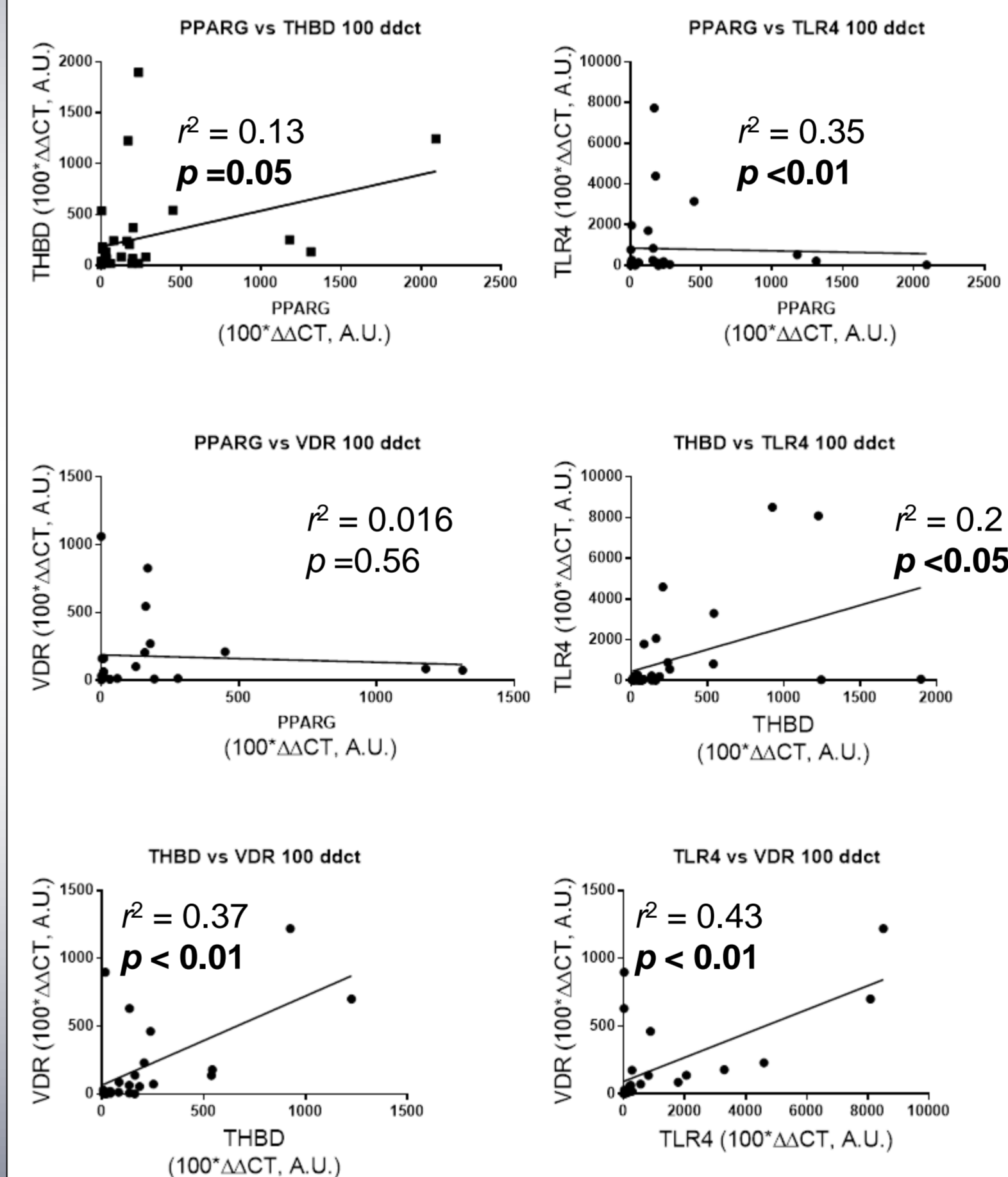


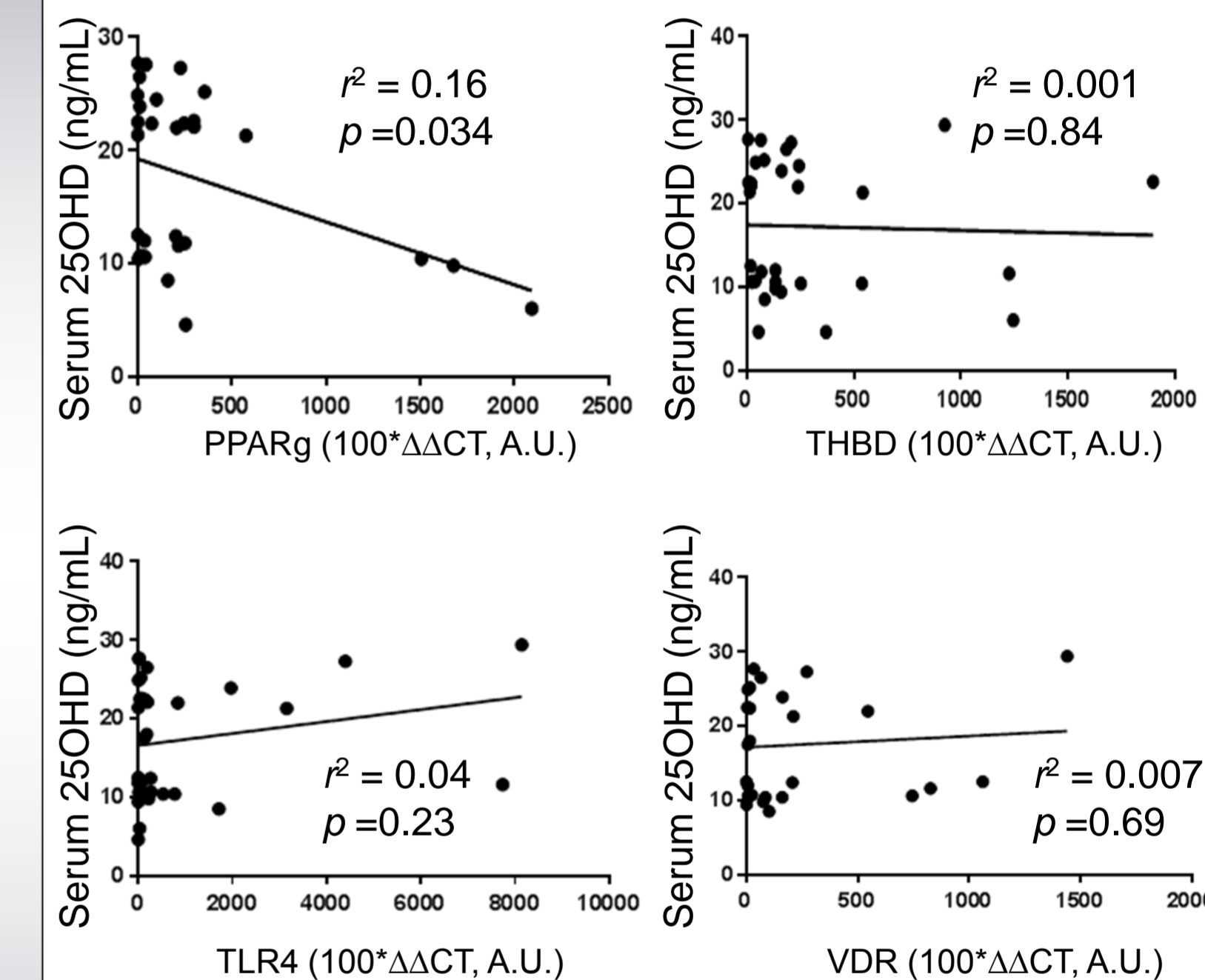
Figure 1. BMI vs Serum 25OHD Levels

Results



Figures 2-6. Gene Expression Correlations (Gene vs Gene)

Results



Figures 7-10. Gene Expression vs Serum 25OHD Levels

Conclusions

- Preliminary findings: VDR-target gene expression correlates with each other but not with circulating serum 25(OH)D levels
- 25(OH)D levels may not indicate levels of vitamin D action and may not be appropriate indicator of vitamin D deficiency in obesity