Endogenous effects of Leptin on Leydig stem cell differentiation are specific to patient's BMI

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Introduction

Several factors like genetic predisposition, lifestyle to environment contribute to male reproductive health. At a cellular level, adult Leydig cells in the testes are essential for reproductive function, as they synthesize and release testosterone. However, the growth and differentiation of Leydig cells could be affected by paracrine factors released by adjacent testicular environment which is constituted of Sertoli and Peritubular myoid cells. In one of our studies, we demonstrated that Leptin, a paracrine factor secreted by Sertoli cells, is critical for Leydig stem cell (LSC) differentiation and subsequent testosterone production via its regulation of desert hedgehog (DHH) signalling. Furthermore, it is well established that obesity plays a role in infertility, and obese men have low testosterone and leptin resistance.

Aim Leptin has specific endogenous effects on Leydig stem cell differentiation that are specific to patient's BMI.

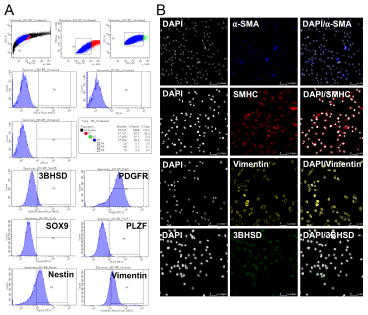
Method

A total of 12 men with testicular failure that were subcategorized as obese (BMI >35), normal (BMI 25-30), and lean (BMI <25) underwent testis biopsies for sperm retrieval.

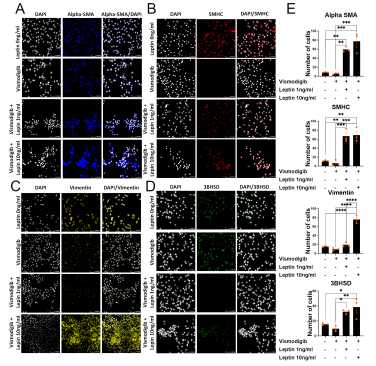
Using an IRB approved protocol, about 10mg of testicular tissue from each of these men were processed for Leydig stem cell isolation, culture and characterized.

GraphPad Prism (GraphPad Software) was used for statistical analysis. All data were presented as the means ± SEM. The statistical significance between two groups was estimated by unpaired two-tailed t test.

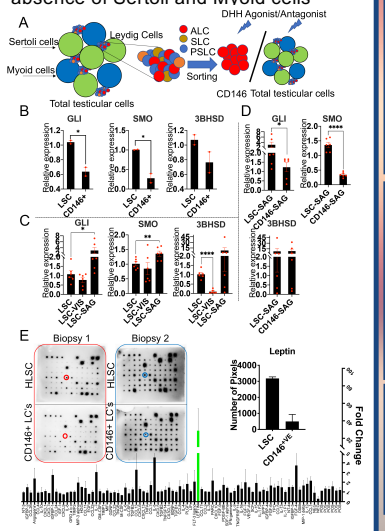
LSCs were cultured in-vitro & characterized



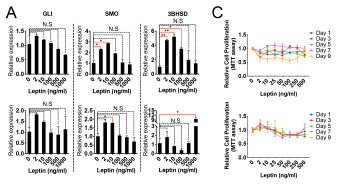
Leptin induces dose dependent differentiation in LSC



Leptin is identified as a paracrine factor which gets inhibited in LSCs in the absence of Sertoli and Myoid cells



Leptin, induces Hedgehog signaling and LSC differentiation at low doses only



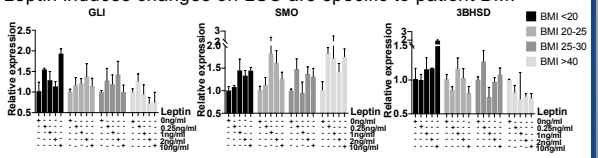
Conclusion

Our results indicate that LSCs can be isolated and cultured from men with testicular failure. Leptin is a paracrine factors released by Sertoli and myoid cells and is critical for LSC differentiation and testosterone production. differentiation and survival.

Acknowledgements

Supported by the American Urological Association Research Scholar Award to HA & RR.

Leptin induces changes on LSC are specific to patient BMI



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