Nrf2 expression. These results suggest that IDS-T2DM induces testicular cell death presumably through caspase-8 activation and mitochondria-mediated cell death pathways, and also by significantly down-regulating testicular *Nrf2* expression and function. SFN up-regulates testicular *Nrf2* expression, and its target antioxidant expression, which was associated with significant protection of the testis from IDS-T2DM-induced germ cell death.

Keywords: High fat diet; male germ cells; *Nrf2*; sulforaphane; type diabetes

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AB197. The prevalence of FSH autoantibodies in the aging male

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Aim: This study was conducted to evaluate the prevalence of FSH autoantibodies in aging male and further observe the correlation between FSH autoantibodies and reproductive hormones.

Methods: The serum samples were collected from 192 normal men whose mean age was 49.47±18.51 (range, 18-88) years and the level of sera FSH, LH, T, SHBG and FSH antibody was detected by RIA and ELISA assay, respectively. Free testosterone index (FTI) was analyzed based on the serum level of total T and SHBG.

Results: The positive incidence of anti-sera against FSH in the group, aged 60-89 years, was significantly higher than that in the group, aged 18-59 years (20.00%, 14/70 *vs.* 9.84%, 12/122) (P<0.05). There was positive correlation between age and the concentration of serum FSH or LH (r=0.306, P=0.0001; r=0.246, P=0.002). Meanwhile, a negative correlation between age and the level of serum T or FTI was also found (r=–0.461, P=0.0001; r=–0.407, P=0.0001). The FSH autoantibodies in different age men do not have effect on the level of serum LH, T, SHBG and FTI. However, in the group aged 60-89 years, the level of serum FSH in the positive FSH autoantibodies samples was lower than that in the negative samples (P<0.05).

Conclusions: Aged men were associated with higher incidence of FSH autoantibodies. The level of serum FSH in aged man could be affected by FSH autoantibodies. Anti-sera against FSH in men might be involved in a certain physiologic process of male aging.

Keywords: FSH autoantibodies; FSH; male aging

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AB198. Nodal regulates the differentiation of iPS cells to male germ cells via Smad2/3, Oct4 and Foxh1 activation

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Objective: The differentiation of male germ cells from iPS cellsprovides an ideal model for unveiling molecular

mechanisms of spermatogenesis. Nodal could promote proliferation of mouse spermatogonial stem/progenitor cells via Smad2/3 and oct-4 activation. The objective of this study was to determine the role of Nodal signaling in the differentiation of iPS cells to male germ cells.

Design: Comparative and controlled study.

Materials and methods: In this study, embryoid body (EB) formation and the exposure of Nodal induction were applied to induce the male germ cells from mouse iPS *in vitro* Germ cell-specific genes and proteins were assessed using real-time PCR, immunoblotting and flow cytometry. The moleculars of Nodal signaling pathway were detected by immunoblotting.

Results: We found that Nodal and its receptors *Alk4*, ActR-IIB except Alk7 were expressed in the mouse iPS cells, whereas both Nodal and its receptors were detected in the EBs. Nodal could promote the propagation of iPS cells and Nodal RNAi disrupted the proliferation of iPS cells. The results of real-time PCR and western blots showed that Nodal could up-regulate the expression of germ-cell marker genes and proteins in iPS-derived EBs. Moreover, the level of Smad2/3 phosphorylation, *Oct4* and *Foxh1* transcription, and cyclin D1 and E were increased with graded Nodal signaling.

Conclusions: Collectively, the above results suggest that Nodal promotes the generation of male germ cells from iPS cells via the activation of Smad2/3 and *Oct4* and *Foxh1* transcription. This study offers novel insights into molecular mechanisms of male germ cell development.

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Keywords: Induced pluripotent stem cells; Nodal; Smad2/3 pathway; male germ cells

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AB199. Human germ cell secreting factor Nodal regulates Sertoli cell functions

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Objectives: To explore the regulatory effects of germ cells and germ cells secreting factor Nodal on the function of Sertoli cells derived from obstructive azoospermia and non-obstructive azoospermia patients.

Design: Comparative and controlled study.

Materials and methods: Human Sertoli cells and germ cells were isolated using two-steps enzymatic digestions from the testes of obstructive azoospermia and non-obstructive azoospermia patients respectively. Expressions of Nodal signaling components in human Sertoli cells and germ cells were identified by PCR and immunochemistry. Human germ cells and Sertoli cells were cocultured *in vitro* to evaluate their effects on Sertoli cells. Human recombinant nodal and its receptor inhibitor SB431542 were added in the Sertoli cells culture medium to study their effects on Sertoli cell functions. CCK8 measurement was used to evaluate the proliferative activity. Q-PCR and western blot were applied to assess the expression of functional Sertoli cell genes.

Results: Human germ cells down-regulated blood-testis-barrier associated genes (*CLDN11*, *OCLN*) expressions of Sertoli cells in co-culture system. Nodal was expressed in germ cells but not in Sertoli cells, whereas its receptors *ALK4*, ALK7, and ActR-IIB were detected on Sertoli cells, which indicated Nodal signaling pathway, may play roles in the regulation of germ cells to Sertoli cells. Human recombinant nodal could promote the proliferation of human Sertoli cells, while the proliferative activity was inhibited by SB431542. Nodal could enhance the expressions of functional Sertoli cell genes (*GDNF*, *SCF*, *BMP4*, and *ABP*), while SB431542 decreased their expressions. In contrast, Nodal decreased the expression of blood-testis-barrier associated genes (*CLDN11*, *OCLN*), while SB431542 increase their expressions.

