Tissues, Pathology, and Diagnostic Microscopy

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The Role of Wnt/Beta-Catenin Pathways in Postnatal Mouse Female and Male Gonadal Development

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Differentiation of gonad from both female and male is start during early stage of development. Ovary or testis inducers factors are allow to emergence differentiation of gonad. Although similar to the initial development of the reproductive organs of the two different course of developments in different control mechanisms and / or can be connected to the same control mechanisms are activated at different times. Different members of the Wnt family is a large family as a result of the different receptors and β-catenin activation or inhibition of control of transcription is controlled by the cell such as proliferation, differentiation, survival, apoptosis, cell polarization and migration. In our study, we investigated the role of Wnt/β-catenin pathways in postnatal developmental period of ovary and testis.

Four weeks old, six weeks old and adult both female and male mouse were sacrificed. Testis and ovary were collected from each group. They were preceding routine paraffin embedding procedure. The sections were stained with hematoxylene-eosine for morphological analyses. Distributions of GSK3β, Dickkopf-1 (Dkk-1), Frizzled-6 (Fzd-6) and Wnt5a were analyzed using indirect immunoperoxidase technique.

While GSK3β immunoreactivity was negative in both ovary and testis from different postnatal age, Wnt5a immunoreactivity was weakly detected in 4 and 6 weeks old testis. This immunoreactivity was increased in adult testis. However, Wnt5a immunoreactivity was negative in ovary from all groups. Dkk-1 immunoreactivity was also negative in all testis, positive immunoreactivity of Dkk-1 was detected in 4 and 6 weeks old ovary. Fzd-6 immunoreactivity was also negative both ovary and testis in all groups, β-catenin immunoreactivity was observed weak and moderate in 6 weeks old and adult testis, respectively.

Problems in the development of the testes or ovarium embriyonic life, as well as abnormalities in male and female reproductive organ may be result because of molecular pathways signaling problems. A disorder in the development of the testis and ovaries is important to know in order to understand the mechanisms that control the developmental process. In our study supported that postnatal developmental stage of testis and ovary was control different Wnt/ β-catenin pathway molecules, in addition, GSK3β may not play a role during postnatal stage of both testis and ovaries. In ovary, Dkk-1 and Wnt5a were expressed, therefore, they may main molecules in ovary rather than testis. In testis, especially β-catenin expression was started early pubertal stage and continues in adult with Wnt5a expressions.

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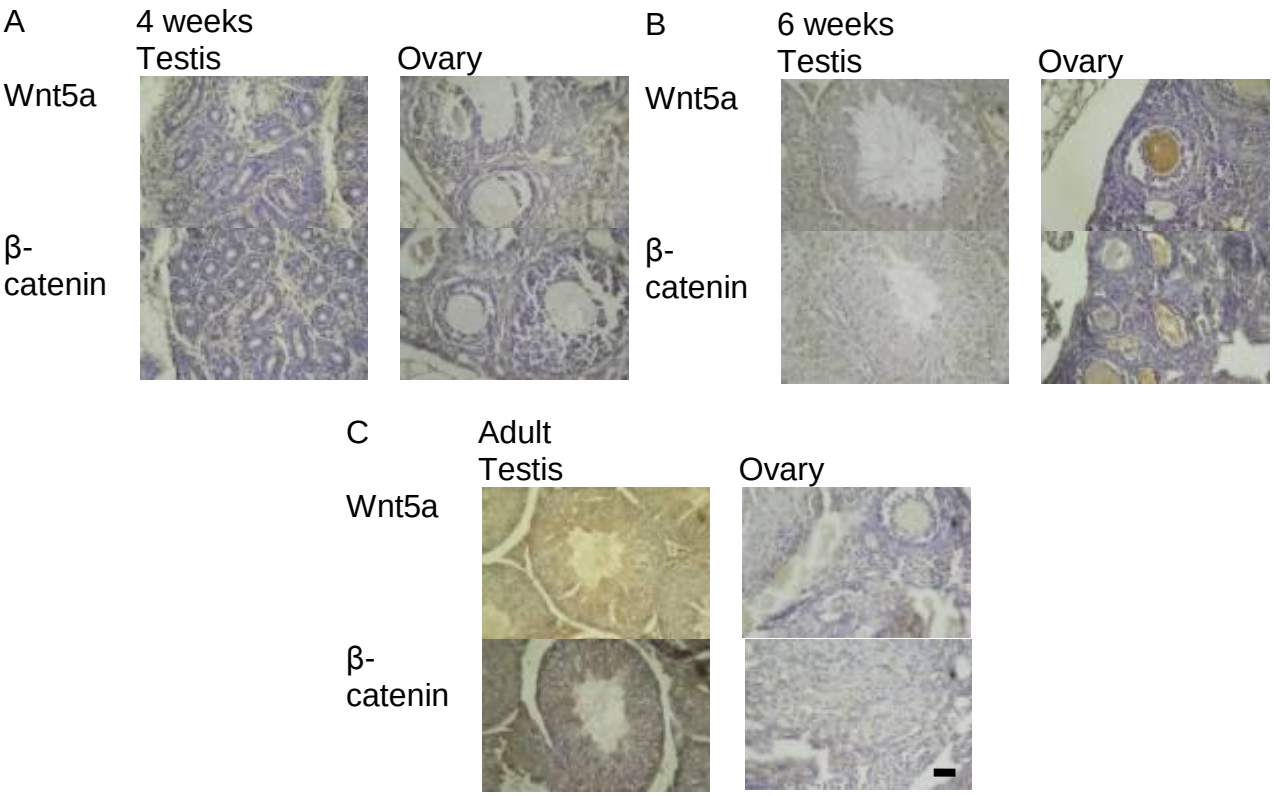

Figure 1. Expression of Wnt5a and β-catenin in ovary and testis in different stage of postnatal period. A: 4 weeks, B: 6 weeks, C: Adult. (Scale bar = 15 μm).