enzymes, such as 3β-hydroxysteroid dehydrogenase, cytochrome P450-containing enzyme (CYP)-11A1, and CYP19A1. We induced functional granulosa-like cells. Also, we explored EMT-related genes such as *N-Cadherin, SNAIL, TWIST, and Vimentin*.

**Conclusions:** We established the effective protocol to generate functional steroid-producing cells. The derivation of these cells explores new avenues for the further study and potential application of these cells in steroidogenesis.

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## The Influence of Progesterone on Beating-rate of Differentiated Mouse Embryonic Stem Cells into Cardiomyocytes

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**Introduction:** Mouse embryonic stem cells (mESCs) have the ability to form aggregates, which are called mouse embryonic bodies (mEBs) and are required for early development of mES cells. These mEBs were spontaneously differentiated into cardiomyocytes. Sex steroid hormones work in the early developing embryo of mice. Like this, were searched the influence of sex steroid hormones during the early differentiation of mESCs.

**Materials and Methods:** Them ESCs were performed hanging-drops for 3 days and were suspended in differentiation medium without LIF for an additional 1 day. 4 day- old mESCs-derived mEBs were attached onto 6 well culture plates and differentiated into cardiomyocytes. Differentiated mESCs were harvested at the each 2day for10 days. We analyzed expression of cardiomyogenesis-related genes, and sex steroid hormone receptors, and observed beating-rate during the differentiation of mEBs. We replaced FBS with charcoal-dextran treated FBS (CD-FBS) so as to investigate the effects of sex steroid hormones during differentiation of mESCs. mEBs were treated with progesterone or mifepristone (progesterone receptor antagonist).

**Results:** The highest beating-rate (92.64%) of mESCs (E14) was reached at the differentiation6d. We observed time-dependently increased expressions in mRNA levels of various cardiac markers, such as *Tbx20*, *Isl1*, *Foxh1*,*cTn1*, and *Ryr2*. And, we identified expressions of cardiac markers, such as *alpha-actinin*, *troponin I* and *atrial natriuretic peptide*(*ANP*) via immunocytochemistry method. Thus, our mESCs (E14) were differentiated into cardiomyocytes. Also, to examine effects of sex steroid hormone, we measured mRNA expressions of steroid hormone receptors. Expressions in mRNA level of *ERa*, *ERβ* and *AR* were time-dependently increased. However, mRNA of *PR* was expressed to opposite pattern of beating-rate during the differentiation. In the CD-FBS treated mEBs, beating-rate (95.08%) was remarkably delayed in comparison with mEBs cultured in CD-untreated FBS. It's means that steroid hormones have influence on beating of cardiomyocytes. Also, beating rate (67.56%) of progesterone treated mEBs is more decreased.

**Conclusions:** In our study, we confirmed that sex steroid hormones have affected the differentiation of mESCs into the cardiomyocytes. The expression profile of PR gene suggests that the progesterone might repress cardiac beating, and other sex steroid hormones might have an effect on increase of beating-rate.

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## Poncirin Induced Fas-Dependent and Mitochondrial Independent Apoptotic Cell Death in *AGS* Human Gastric Cancer Cells

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**Introduction:** Gastric cancer, also called stomach cancer is one of the diseases that have the highest mortality and morbidity worldwide. Globally gastric cancer is the fourth leading cancer and is the second leading cause of cancer-related death, following lung cancer. Thus, it would be significant to find potential anticancer dietary factors or antineoplastic drugs with potent therapeutic effects on