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**Evaluation and comparison the embryotoxicity of mainstream and sidestream smoke on cardiogenesis**

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Cigarette smoke (CS) exposure has been a world-wide problem that threat human's health. It was a risk factor for cardiovascular diseases, diabetes and bad outcome of birth. To investigate the adverse effect that CS induced in the early stage of development and search for the possible mechanism of bad outcome of birth, the embryonic stem cell test (EST) was applied, for the pluripotency and inducible manipulation of embryonic stem cells (ESCs). EST has been validated to be a feasible in vitro method for the prediction of developmental toxicity, and cardiomyocytes derived from mouse ESCs were an ideal model for the study of early stage of cardiogenesis. Here, we designed a cigarette smoke collection machine to separate the mainstream smoke (MSS) and sidestream smoke (SSS). Adjusting to same volumes, cigarette smoke condensates (CSEs) of both were collected, and then mouse ESCs were exposure to different concentrations of CSEs during the process of differentiation. Expression of key transcription factors, such as Gata4, Tbx5, Tbx20 and Mef2c, and transcript myosin heavy chain (MHC) were detected by real-time PCR analysis when the exposure phase ended. Our data showed that both MSS and SSS were classified as strong teratogens according to the EST protocol, and revealed a different expression pattern between MSS and SSS exposure. It was noteworthy that SSS inhibited the expression of Gata4 specifically. Further study was needed to confirm that if there was any relation between the CSs exposure, inhibited expression of Gata4 and cardiac-related bad outcome of birth.

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**The use of mysidopsis juniae as test organism for evaluation of acute and kinetics of acute toxicity from soluble fraction of the gasoline used in Brazil**

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The aim of this study is to evaluate the acute toxicity and kinetics of the toxicity of soluble fraction of gasoline. We prepared a stock-solution with 50 ml of gasoline and 950 ml of deionized water. This mixture was stirred for a period of 24 hours to separate the water-soluble portion. For the toxicity trials concentrations used were 0.1%, 0.5%, 1%, 1.5%, 2%, 4% and 10% (volume / volume) prepared in reconstituted seawater in 200 mL flasks. In order to set up the test, 5 organisms between 3 to 5 days old were placed in each flask, with reconstituted seawater. The test conditions were 32 for salinity, 12h light and 12h darkness for photoperiod and 25 °C for temperature. The organisms were fed once a day with *Artemia* sp. The count was made every 2 hours to complete 12 hours and after which the count is made every 12 hours to complete 48 hours. The LC50 (48 h) calculated by Probit method and was 1.97%. For the kinetics of toxicity was possible to achieve acute effects after 6 hours of test. At concentrations below 2% the effects were absent after 36 hours of testing. At 4% concentration, the effects remained until the 48 hours, while at 10% concentration mortality of the population after 2 hours of test was 100%. The use of *Mysidopsis juniae* made it to be possible to evaluate the toxicity of gasoline and it is necessary that the substance is handled with care to minimize environmental risks.