Title of Research:

17_PT01-02

Development of novel screening system to predict the effects of environmental factors in each organ by using cell-free circulating DNA in serum
Subtitle: Advanced system for prediction of hazards from environmental factors in fetus using cell free fetal DAN in mother's blood

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Summary of Research:

  To prevent the several adverse effects induced by environmental factors including chemicals, it is very important to develop a novel screening system for each organ. Moreover, the system should be low invasiveness and simple method to obtain the results immediately. In this study, to develop the system, we have focused on the differences of epigenetic status in each organ-derived genome DNA and utilized cell free circulating DNA(cfDNA) / cell free fetal circulating DNA(cffDNA) to predict and evaluate the effects of environmental factors in whole organs. This advanced system also have possibilities to predict the effects of the factors in fetus using mother's serum.
Through this term, first, we performed whole genome bisulfite sequence (WGBS) to explore the organ specific markers in brain, liver, and heart from embryonic day14.5 (E14.5) fetuses. These data were combined with the others of dams and E12.5 fetuses from Gene Expression Omnibus (GEO), and we picked some candidates out for each organ. To investigate whether these candidates are useful for the system or not, we have evaluated these using the dummy of cfDNA derived from fetal tissues. In addition, we have produced organ specific injured-model mice for brain, liver, kidney, and pancreas to examine the specificities of the candidates for these organs.

Timeline:

March 1, 2017 -

Topics:

Poster presentation at 2017th JCIA LRI Annual Workshop, title: Development of novel screening system to predict the effects of environmental factors in each organ by using cell-free circulating DNA in serum

Publications: