1. **No.**

   FP01908139

2. **Title**

   Effect of MAternal Smoking, diet QUality, and Gene-diet Interaction on Fetal Growth and Epigenome (MASQUE study)

3. **Period**

   2018-2020

4. **Summary**

In this study, (1) maternal low consumption of green and yellow vegetables during pregnancy and the low gestational weight gain (GWG) was statistically significant for small-for-gestational-age babies. However, smoking was not statistically significant. (2) Infant birth weight is independently associated with severe postpartum hemorrhage (PPH). Moreover, other factors including maternal BMI, GWG, and gestational week of delivery may also be related to severe PPH through infant birth size. Pre-pregnancy health care and appropriate GWG may play a role in safe delivery. (3) LBW itself may be associated with the epigenetic modulation of the immune system and cell maturation. Consequently, hyper-differentially methylated genes (DMG) in LBWs (e.g., macrophage differentiation, apoptotic mitochondrial changes, negative regulation of inflammatory response, and ovarian cumulus expansion) were identified. (4) High consumption of green and yellow vegetables among mother who smokes during pregnancy was associated with epigenetic modulation of fetal growth-related genes. The lower DMG (IGF1R and GHR) was identified in these infants. (5) IGF1R polymorphism is involved in birth weight and birth height decrease. (6) The GWG is an effective maternal factor to increase fetal birth size regardless of fetal IGF1R genotype and maternal smoking habits.

The results of the current study suggest that high healthy food consumption during pregnancy and appropriate GWG exceed the disadvantage of own fetal genotype and maternal smoking.