香港浸會大學
HONG KONG BAPTIST UNIVERSITY

環境與生物分析國家重點實驗室
State Key Laboratory of
Environmental and Biological Analysis

Piglet models to study perinatal inflammation in preterm neonates

by

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All Interested are Welcome

Abstract

Each year 15 million infants are born preterm (<37 wks gestation, 5-18% incidence across the world) and more than 1 million of them die. Preterm newborns are often affected by inflammatory insults before birth, *e.g.* maternal chorioamnionitis, and systemic infections, e.g. late onset sepsis, (LOS, > 72h after birth) after birth. Both conditions have adverse effect on development of the gut, immunity and brain in these newborns. Correspondingly, in this study, two piglet models were established to investigate the effect of prenatal inflammation and postnatal infections on development of the gut, immunity and the brain of neonates and to search for novel diagnostic biomarkers. In the model of neonatal infection, piglets delivered preterm by caesarean section were infused with cultured *Staphylococcus epidermidis* directly into the umbilical artery. Post the infection challenge, blood lymphocytes and monocyte counts increased, and so did the blood-cerebrospinal barrier permeability and leucocytes counts in cerebrospinal fluids (CSF) as well as multiple neuroinflammation-related genes. Proteomics and metabolomics works are planned and on-going. For the model of prenatal inflammation, pig foetuses received an intra-amniotic dose of LPS (1 mg/foetus) three days before preterm delivery. After delivery, increased inflammatory markers, including leukocyte counts and pro-inflammatory cytokines, were found in the amniotic fluid and the cord blood of the newborn piglets, and some of the elevated levels were maintained for four more days. Establishment of these two models renders opportunity for investigation of perinatal inflammation-associated developmental impairment of multiple organs and systems in a mechanistic fashion and search for potential intervention targets by diary bioactives.

Biography of Dr. Pingping (Gareth) Jiang

Pingping (Gareth) Jiang obtained his PhD in Food and Nutritional Sciences from the University of Hong Kong with a work on the intestinal proteome change in piglets predisposed to necrotising enterocolitis, a devastating gastrointestinal disease in preterm neonates. Later on he pursued his PostDoc training in Prof. Per T. Sangild's group on comparative paediatrics and nutrition at University of Copenhagen, Denmark, and his research focus is nutritional proteomics and metabolomics in paediatrics. Gareth utilises analysis platforms such as LC-MS, GC-MS and NMR via collaborations to study the effects of interplay of nutrition and the gut microbiome as well as perinatal inflammation on different organs, including the gut and the brain, in preterm neonates. He also serves as invited reviewer for multiple journals, including *Journal of Proteome Research, Scientific Reports, Journal of Proteomics, PLoS One, Expert Review of Proteomics, Expert Review of Molecular Diagnostics, Pediatric Research.*