1. No.
   2021Y015

2. Title
   Analysis of the effects of dioxins on human fetal and neonatal hematopoietic cells using humanized mice

3. Period
   2021-2023

4. Summary
   This study aimed to elucidate the effects of dioxins on hematopoiesis in human fetuses and neonates, a topic on which there has been little knowledge to date. Utilizing highly purified human umbilical cord blood-derived hematopoietic stem cells (HSCs), I discovered that 2,3,7,8-TCDD exhibit a dose-dependent inhibitory effect on the production of hematopoietic stem/progenitor cells from HSCs. Interestingly, differentiation processes from HSCs to mature cells were minimally affected by 2,3,7,8-TCDD exposure, suggesting a specific action of dioxins during HSC self-renewal or differentiation stages. Furthermore, in conditions lacking mesenchymal stem cells (MSCs), it was revealed that low concentrations of 2,3,7,8-TCDD did not affect the production of hematopoietic stem/progenitor cells, suggesting the existence of an indirect pathway through which dioxins could alter the hematopoietic niche cells, subsequently affecting the support and proliferation of HSCs. These findings represent an important step towards understanding the effects of dioxins on the human hematopoietic system and could provide insights for future risk assessments and the development of therapeutic strategies.