

# Induction of controlled hypoxic pregnancy in large mammalian species

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© 2015 The Authors. Progress in the study of pregnancy complicated by chronic hypoxia in large mammals has been held back by the inability to measure long-term significant reductions in fetal oxygenation at values similar to those measured in human pregnancy complicated by fetal growth restriction. Here, we introduce a technique for physiological research able to maintain chronically instrumented maternal and fetal sheep for prolonged periods of gestation under significant and controlled isolated chronic hypoxia beyond levels that can be achieved by habitable high altitude. This model of chronic hypoxia permits measurement of materno-fetal blood gases as the challenge is actually occurring. Chronic hypoxia of this magnitude and duration using this model recapitulates the significant asymmetric growth restriction, the pronounced cardiomyopathy, and the loss of endothelial function measured in offspring of high-risk pregnancy in humans, opening a new window of therapeutic research.