

MICROBIAL PATHOGEN CONTAMINATION IN MOUSE GAMETES AND EMBRYOS

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ABSTRACT

Large numbers of transgenic and knockout mice have been generated. Cryopreservation provides an efficient and effective way to maintain these unique genetically modified rodent lines. However, there is a great risk of transmitting various diseases via the cryopreserved gametes and embryos. To investigate which of the commonly found murine pathogens contaminate mouse gametes and embryos, seven commonly found pathogens in research mice were evaluated in semen, oocyte-cumulus complexes and embryos collected from naturally infected mice in the first part of my study. These seven pathogens are: mouse parvovirus, *Helicobacter*, *Mycoplasma pulmonis*, *Pasteurella pneumotropica*, murine norovirus, mouse hepatitis virus and Theiler's murine encephalomyelitis virus. Five pathogens, mouse parvovirus, *Helicobacter*, mouse hepatitis virus, murine norovirus, Theiler's encephalomyelitis virus, were found in mouse gametes and embryos. These findings indicate there is a potential risk of transmitting microbial pathogens via cryopreserved gametes and embryos.

The second part of this study focused on evaluating mouse parvovirus and determining the effect of infection in male mice on *in vitro* fertilization including how it will change fertilization rate, cleavage rate and embryonic development and whether mouse parvovirus transmits to embryos at blastocyst stage. We did not find mouse parvovirus-1 infection in male mice transmitted to *in vitro* produced embryos and there was no effect on fertilization rate, cleavage rate and embryonic development following *in vitro* fertilization.