

17 February 2005

INTRODUCING BRANDY – MONASH'S LATEST ADVANCE IN CATTLE CLONING

Australian pioneers in cattle cloning, the scientists at Monash Institute of Medical Research – MIMR (formerly known at Monash Institute of Reproduction & Development), are pleased to announce the arrival of Brandy, the world's first calf produced using a new cloning technique known as serial nuclear transfer.

Born just prior to Christmas, this healthy Holstein-Fresian calf is the latest product of an ongoing collaborative research program. Experts from MIMR and Genetics Australia Co-operative Ltd have been working together for over five years to refine and improve efficiencies in cattle cloning for possible agricultural application in the future.

The cells used to create Brandy in this current project, underwent two rounds of nuclear transfer in the cloning procedure before they developed into an embryo ready for implantation into a surrogate cow.

"By repeating the nuclear transfer we hoped to improve the reprogramming of the fused donor cells and produce healthier embryos which are more likely to proceed to live births," explained Vanessa Hall, the PhD student who performed this research at MIMR.

Since the arrival of Dolly in 1997, the world's first animal produced using standard nuclear transfer, there have been limited improvements in the efficiencies of cloning despite considerable effort worldwide. Very few implanted cloned embryos survive full term pregnancies. A large number are lost at various stages of fetal development. Evidence suggests that this could be due to reprogramming problems which affect the development of the placenta.

"Merging the cytoplasm or nutrients of a cloned embryo with that of a recently fertilized egg is about creating the right environment for the cloned embryo to develop," explained Ms Hall. "This may be as important as the actual fusing of the cells in the success of this program."

"Eggs fertilized using IVF techniques are known to have a high capacity to develop into calves. Therefore by using the cytoplasm from these eggs we aim to provide additional factors to the cloned embryo that will improve the quality of the placenta," she said. So far the indications are promising."

"Although there are extra steps involved in SNT, we believe it could improve efficiencies if a larger number of healthy offspring are produced from less cloned embryos," she said. "Other technical issues still exist but SNT may overcome the placental problems and help unravel the complex issues associated with process of DNA reprogramming"

"SNT and other cloning techniques are designed to complement natural breeding strategies. Over the next decade, as higher success rates are established, these scientific developments could provide farmers with the option of some powerful new reproductive tools. Cloning allows for the rapid dissemination of elite genetics from both male and females lines.

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