

Cloned Buffalo “GARIMA-II” born at N.D.R.I., Karnal

Dr. A.K. Srivastava, Director National Dairy Research Institute informed that another cloned buffalo calf, through the new and advanced ‘Hand-guided Cloning Technique’ was born at NDRI, Karnal on August 22, 2010. Dr. A.K. Srivastava said that “this cloned buffalo calf is different from the earlier clone calf because, in this case the used donor cell was embryonic stem cell”. However, in earlier cloning, the donor cell was from somatic cells. The donor embryonic stem cell was isolated from the 8 day old blastocyst. These cells were cultured up to 29-passages (117 days) till it expressed pluripotent marker and then confirmed to be stem cell.



Dr. A.K. Srivastava, Director emphasized that this technology could go a long way in helping for faster multiplication of superior milch buffaloes in India. He said that although the world’s largest population of buffaloes is in India and they are contributing about 55% of total milk production in country, but the percentage of elite animals is very

low and there is an urgent need to enhance the population of these elite buffaloes. He further emphasized that there is an acute shortage of good bulls and the technology of cloning will decrease this gap between supply and demand of breeding the bulls in the shortest possible time.



The team of the jubilant scientists involved in the production of this cloned calf using embryonic stem-cell as donor cell are Dr. M.S. Chauhan, Dr. S. K. Singla, Dr. R.S. Manik, Dr. P. Palta, Dr. Shiv Parsad, and Dr. Aman George of N.D.R.I., Karnal. The scientists are of the opinion that the embryonic stem cells have better cloning ability as compared to somatic cells, as such the epigenetic reprogramming of these cells is much more efficient than the somatic cells, which are already differentiated and lineage committed.

Earlier NDRI has produced the world cloned buffalo calf on 6th February, 2009. The hand-guided cloning technique developed at NDRI, is an advanced modification of the “Conventional Cloning Technique”. In this technique, immature oocytes were isolated from ovaries and were matured in vitro. These were then denuded and treated with an enzyme to digest the outer layer of oocytes called ‘zona pellucida’. The oocytes were then treated with chemicals to push their genetic material to one side of the oocyte. This protruded side was then cut off with the help of “hand held fine blade” for removing the original genetic material of the oocyte. The enucleated oocyte was then electrofused with single cell taken from colony of embryonic stem cells. The resulting embryos were cultured and grown in the laboratory for seven days to develop them to the stage of blastocyst. The blastocysts were transferred to recipient buffaloes.

This cloned calf weighing 32 kg. was born through caesarian operation carried out by a team of doctors comprising Dr. R.S. Bisla from CCSHAU, Hisar and Dr. K.P.S. Tomar, Dr. Subhash Chand and Dr. Parveen Kumar and Dr. M.K. Srivastava from NDRI, Karnal. The animal is as alert as any other animal and is apparently normal and healthy.

Dr. S Ayyapan, Director General, Indian Council of Agricultural Research and Secretary DARE, Govt. of India, New Delhi congratulated the team and said that the new technology of “Hand-guided Cloning” of buffaloes may lead a new era in faster multiplication of elite germplasm to face the challenges of increasing demands of milk in view of the ever growing human population. Dr. K.M.L Pathak, Deputy Director General and Dr. C.S. Prasad, ADG, (AS) ICAR also congratulated the team.