

Towards Viksit Bharat@2047 Technological Innovations and Policy Options for Eastern Region



ICAR Research Complex for Eastern Region

ICAR Parisar, P.O. Bihar Veterinary College
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Towards Viksit Bharat@2047: Technological Innovations and Policy Options for Eastern Region

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Identification of CCL8 and CXCL10 as Early Pregnancy Biomarker in Buffaloes

Period of development: 2018 - 2022

Developers:

Rajni Kumari, S Dayal, PC Chandran, PK Ray, Sanjay Kumar, Jyoti Kumar, Reena Kamal, A Dey, Kamal Sarma

Background:

Successful pregnancy establishment has a major influence on reproductive efficiencies of dairy buffaloes. And this success depends on coordinated communications between conceptus and maternally derived cells and any disturbance in this communication network during this process leads to early embryonic losses. Present investigation aimed to understand the expression dynamics and correlation pattern of chemokines during peri-implantation period in dairy buffalo through transcriptional profiling followed by Principal Component Analysis. Our study revealed up regulation of all the candidate genes in maternal whole blood across the parity, emphasizing the involvement of immune responses as signatures for healthy pregnancy.

Description of the technology:

The study was conducted to determine the functional involvement of chemokines by studying expression profile of chemokine biomarker CCL8 and CXCL10 genes during peri-implantation period in whole blood of artificially inseminated dairy buffaloes. For this, expression profile of both these chemokine genes in whole blood of Murrah buffaloes on day 12, 15, 18 and 21 post artificial insemination (AI) using SYBR green chemistry based quantitative real time reverse transcription PCR. Our investigations revealed a consistent increase in transcriptional abundance of CCL8 and CXCL10 genes during this period, although the difference in expression level was not significant between day 15 and 18 post AI for CXCL10 gene. Study also included the effect of parity on the expression profile of these two genes and found that expression level of both these genes is independent of parity status of the animal. Our results indicate that increased expression of both these chemokines is a pregnancy dependent event and thus their expression profiling can be used as early pregnancy biomarker on any day between days 12 to 21 post artificial insemination in buffaloes. Irrespective of their parity status. The study will help in determination of positive pregnancy during early gestation in buffaloes and therefore, will improve fertility in buffaloes.

Commercial potential:

The technology can be offered through consultancy services or outsourced to the State Animal and Livestock Department, Veterinary Colleges, Development agencies, NGOs, and farmers' groups.

Impact:

The use of this biomarker may lead to socio-economic upliftment of dairy farmers

Agro-ecoregions suitability:

All over India

Reference

Kumari R, Dayal S, Sharma I, Kumar S, Chandran P C, Dey A, Ray P K, Kamal R K, Kumar J and Sarma K. 2021. Expression profiling of chemokines CCL 8 and CXCL10 during peri-implantation period in murreh buffaloes as a possible signature of embryonic implantation. *Indian Journal of Animal Sciences*, 91(8): 632-635