

2nd International Conference on **Animal & Dairy Sciences**

September 15-17, 2014 Hyderabad International Convention Centre, India

Elf3 and FOXA2 loci, probable putative Trans-QTL for abnormal sperm percentage in cattle: An *in-silico* analysis

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Sperm motility and morphology are usually considered for semen or breeding soundness evaluation of bulls. Currently, there are only two studies reporting three QTL (BTA 20, 21 and 27) for abnormal sperm percentage in Animal QTLdb. No genome wide association studies were performed for this trait as such. Hence, the objective of this In-silico analysis was to identify the putative trans-QTL based on the 134 genes located in the reported QTL. Functional annotation by Panther 9.0 identified that many genes are involved in cellular (42), metabolic (53), binding (37) and catalytic (33) activities. Pathway analysis found that 25 genes are involved in 21 pathways with a major contribution of GnRH pathway members (follistatin, PTGER4, ISL1 and MAP3K1). These observations indicate that structural and functional variations in these genes could cause variation in abnormal sperm percentage in cattle. However, identification of common transcription factors (TF) regulating these genes can provide an opportunity to identify the trans-QTL for this trait. Hence, all the 134 genes were analysed by single site analysis based on human genome by the oPOSSUM 3.0 software. A total of 178 TF were predicted to be regulating at least 2 genes within 5000 bp up-or down-stream of a gene. However, with a Z-score >10 and Fisher-score >7, the ELF3 on BTA16 and FOXA2 on BTA13 were considered to be highly probable TF for at least >45 genes. Hence, the ELF3 and FOXA2 loci could be considered as probable putative trans-QTL for abnormal sperm percentage in cattle.

Biography

Suneel Kumar Onteru has completed his BVSc & AH from College of veterinary science, Tirupati, MVSc in Veterinary Biochemistry from College of Veterinary Science, Rajendra Nagar, PhD in Animal Biochemistry from National Dairy Research Institute, India in 2007. Later, he did postdoctoral studies at Animal Science Department, Iowa State University, Ames, Iowa, USA from 2007-2012. Currently, he has been working as a Senior Scientist at Animal Biochemistry Department, NDRI, Karnal, India from 2013 onwards. He published a total of 29 publications in reputed journals.

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