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Inter-relationship of mammary adipose and epithelial stem cells and the determination of myogenic satellite cells potential in regenerating diseased mammary gland in ruminants

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Abstract

Mammary gland is a unique organ which follows a cyclic growth, development and regression and it encompasses several progenitors (i.e. adipose, epithelial and myo-epithelial stem cells). Whether these cells regulate or gets regulated by nutritional or lactational factors is quite a debatable issue. Several researchers have raised this issue in the past but have never addressed the molecular mechanism beneath to unfurl several unanswered questions. To investigate whether nutritional status has anything to do with adipose formation and suppression of epithelial and myo-epithelial stem cells and vice versa. We isolated mammary adipose stem cells and epithelial stem cells from high energy fed goats and characterized them for stemness. We studied the differentiation and transdifferentiation of both of these cells in the presence of thiazolidenediones/ or linolenic/ or retinoic acid and keratinocyte growth factors and investigated several upregulated and downregulated adipogenic and epithelialization mRNA expressions. We also investigated relationship of isolated myogenic satellite cells with adipose and myoepithelial cells to draw a future line of treatment for regenerating injured/or diseased mammary gland. We believe that proper understanding of the molecular mechanism in the mammary gland developmental process is highly required to further understand how this particular organ grows and regresses during different stages of its development and how does the different mammary progenitor which resides in it normally behave to interplay to carry out the growth and regression of this gland.

Biography

Naresh Kumar Singh accomplished his Ph.D in 2005 from Indian Veterinary Research Institute and postdoctoral studies from National Livestock Research Institute, South Korea. His past research on cartilage cell biology/regeneration and proteomics of differentiated and trans-differentiated states of various stem cells was highly commendable and at present he is also holding several research issues relating to stem cells and regeneration in animals and humans. Presently, Dr. Singh is professor of Animal Biotechnology at Kangwon National University, Korea. He has published more than 50 papers in reputed journals and serving as an editorial board member of various reputed animal science societies.