

The frontiers of biomedical science and its application to animal science in addressing the major challenges facing Australasian dairy farming

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Table S1. Summary of key publications on bovine exosomes by source

Source	Isolation method	Main finding	Reference
Milk	Ultracentrifugation	bta-miR-142a and -223 are promising biomarkers for the early detection of bacterial infection in cow mammary glands.	(Cai, He et al. 2018)
	Sucrose gradient centrifugation		(Sun, Aswath et al. 2015)
	OptiPrep density gradient centrifugation	Proteins encapsulated into milk exosomes regulate the immune response and growth.	(Samuel, Chisanga et al. 2017)
	OptiPrep density gradient centrifugation	Milk exosomes contain proteins that reflects cellular functions that are unique to the milk compartments. They are involved in biological processes such as developmental and metabolic processes.	(Koh, Peiris et al. 2017)
	Sucrose density gradient centrifugation	Participate to eliminate BLV proteins from infected cells.	(Yamada, Shigemura et al. 2013)
	Ultracentrifugation	Exosomes are resistant to acidic conditions. MicroRNAs have key roles in the development of calf's gastrointestinal and immune system.	(Hata, Murakami et al. 2010)
Plasma	Ultracentrifugation coupled with size exclusion chromatography	Involved in structural molecule activity and immune system processes. Have potential roles in the early diagnosis of uterine infection in dairy cows.	(Almughlliq, Koh et al. 2018)
	Ultracentrifugation coupled with size exclusion chromatography	Exosomes have roles in reproduction and provide information on the fertility status.	(Koh, Peiris et al. 2018)
	OptiPrep density gradient centrifugation	Potential roles in the immune function in transition dairy cows and exosomal protein cargo as biomarkers of metabolic state.	(Crookenden, Walker et al. 2016)
	OptiPrep density gradient centrifugation	Exosomes profiles may reflect the fertility status of the cow. And proteins are involved in	(Mitchell, Scholz-Romero et al. 2016)

		immunomodulatory processes and cellular communication.	
	Ultracentrifugation	Exosomes derived from grazing cows has higher miR-451 expression, which is associated with skeletal muscle. It has potential roles in the secretion or intake of miRNAs between circulation and tissue cells in grazing cattle.	(Muroya, Ogasawara et al. 2015)
Follicular fluids	Ultracentrifugation	Support cumulus expansion	(Hung, Hong et al. 2015)
	Ultracentrifugation	Oocyte developmental competence and cell-to-cell communication in the follicular microenvironment.	(Sohel, Hoelker et al. 2013)
Blastocysts	Ultracentrifugation	Bovine embryo release exosomes and their composition varies dependent on the embryo competence .	(Mellisho, Velasquez et al. 2017)
	Ultracentrifugation	Essential for blastocyst formation, blastocyst quality, and following development to term.	(Qu, Qing et al. 2017)
Oviduct	Ultracentrifugation	Has key proteins involved in sperm-oocyte binding, fertilization and embryo development.	(Alminana, Corbin et al. 2017, Alminana, Tsikis et al. 2018)
Epididymal fluids	Differential centrifugation	Involved in cell-to-cell communication in bovine spermatozoa during epididymal maturation.	(Caballero, Frenette et al. 2013)
Seminal plasma	Sucrose-density gradient ultracentrifugation	metabolically active and are capable of producing extracellular ATP	(Ronquist, Ek et al. 2013)
Cell culture	Ultracentrifugation	Granulosa cell culture exosomes carry antioxidant molecules by mediating defence mechanism against oxidative stress.	(Saeed-Zidane, Linden et al. 2017)
	OptiPrep density gradient centrifugation	Alteration of exosomal content and release by bovine endometrial intercaruncular stromal cell line can reflect the	(Koh, Peiris et al. 2016)

		physiological state as well as when cells are in stress conditions.	
	Ultracentrifugation	Exosomes derived from bovine oviduct epithelial cells positively affect the quality of bovine embryo, the communication between the oviduct and the embryo in the early stages of development and induce cryoprotection.	(Lopera-Vasquez, Hamdi et al. 2016)

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