

miRNA containing exosomes in seminal plasma

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As well as sperm, seminal fluid contains various small membrane-bound vesicles including so-called prostasomes, exosomes of approximately 100 nm in diameter that are secreted by prostate epithelial cells. Prostasomes have been postulated to perform several functions, including modulation of immune cells within the female reproductive tract and stimulation of the motility and capacitation of sperm. How prostasomes could mediate such diverse functions, however, remains unclear. In most studies, prostasomes have been isolated as a single population of small vesicles from seminal plasma, whereas they more likely represent a heterogeneous mixture of vesicles produced by different reproductive glands and secretory mechanisms.

We recently purified and characterized nano-sized vesicles from seminal fluid obtained from vasectomized men, thereby excluding contributions from the testes or epididymides. The vesicles were separated on the basis of 1) size by gel filtration chromatography; 2) buoyant density by sucrose gradient centrifugation; and 3) surface markers by immuno-isolation. The combined results demonstrate the presence of multiple populations of vesicles, with distinct characteristics. Intriguingly, one population of vesicles contained small RNAs, including miRNAs. We propose that these vesicles target their miRNAs to yet undefined cells within the female reproductive tract where they may induce epigenetic effects.