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# Exosomes: A Major Phenomenon Flying Under the Radar

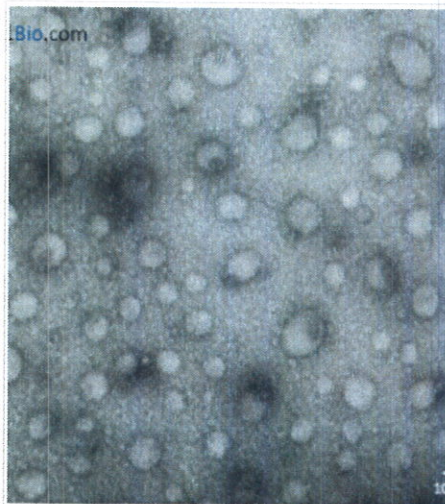
By bsargent on September 24, 2015

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A guest blog by William G. Whitford, Strategic Solutions Leader, BioProcess, GE Healthcare Life Sciences

## Exosomes in Nature

It was discovered some time ago that eukaryotic cells regularly secrete such structures as microvesicles, macromolecular complexes, and small molecules into their ambient environment. Exosomes are one of the types of natural nanoparticles (or nanovesicles) that have shown promise in many areas of research, diagnostics and therapy. They are small lipid membrane vesicles (30-120 nm) generated by fusion of cytoplasmic endosomal multivesicular bodies within the cell surface. Exosomes are found throughout the body in such fluids as blood, saliva, urine, and breast milk. Furthermore, all types of cells secrete them in in vitro culture. It is believed that they have many natural functions, including acting as transporters of nucleic acids (mostly RNA), cytosolic proteins and metabolites to many cells, tissues or organs throughout the body. Much remains to be understood regarding how they are formed, as well as of their targeting and ultimate physiological activity. But many don't realize that some activities have been rather thoroughly demonstrated— such as their function in some sort of either local or more systemic intercellular communication.



## Exosomes as Tools

General interest in exosomes is now growing for many reasons. One is because of the observation of their natural activity with antigen-presenting cells and in immune responses in the body. Their potential as very powerful biomedical tools of both diagnostic and therapeutic value is now being more widely reported. Applications described include using them as immunotherapeutic reagents, vectors of engineered genetic constructs, and vaccine particles. They've also been described as tools in the diagnosis or prognosis of a wide variety of disorders, such as cancer and neurodegenerative diseases. Also, their potential in tissue-level

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