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**Development of an Optimized Method for the Rapid Detection of
Exosomes**

Dissertation submitted in partial fulfillment of the requirements for the degree of

**Bachelor of Science
in
Biotechnology**

Submitted By

Ms. Talitha Keren Kurian

Reg. No.: 161701020

Sixth Semester, BSc. Biotechnology

Manipal School of Life Sciences

Manipal Academy of Higher Education, Manipal-576104, India

Thesis Advisor

Dr. Nirmal Mazumder

Assistant Professor

Department of Biophysics

Manipal School of Life Sciences

Manipal Academy of Higher Education, Manipal--576104, India

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Abstract: Exosomes are nanometer-sized vesicles bound by a lipid membrane. Their emerging significance as disease biomarkers makes them a compelling choice for future diagnostic methodologies. This transformative approach replaces the discomfort of needle biopsies with 'liquid biopsies,' where the analysis of exosomes, secreted into circulating bodily fluids such as blood and urine by the parent cells, offers a precise means to detect and assess the severity of diseases. Therefore, they can also be used to study the effectiveness of treatments. However, a major obstacle in the field of exosome research is the complexity involved in the isolation of pure exosome samples and directly quantifying them, mainly due to their small size. The development of an efficient, inexpensive, and easy method for the isolation and precise quantification of exosomes from clinical specimens would remarkably enhance research on their potential as biomarkers for a range of diseases and therapeutic systems. In this study, we used absorption and fluorescence spectra as indicators to quantify the exosome count within a given sample. In this study, we used absorption and fluorescence spectra as indicators to quantify the exosome count within a given sample and compared the results with those from protein concentration assays and dynamic light scattering measurements. These techniques require no disruption or manipulation of the extracellular vesicles and leave them unchanged for further studies, such as protein and RNA content determination. This study proved that spectrophotometric readings could provide an estimate of the exosome concentration present in the sample.