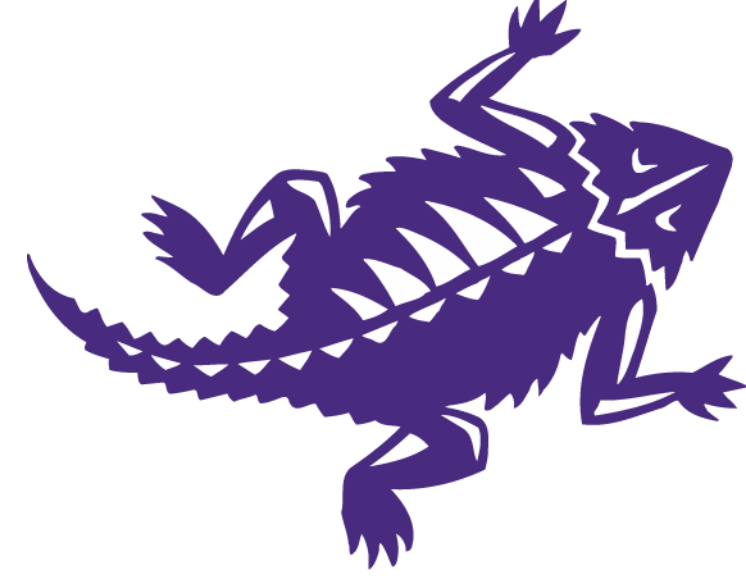


# The Viability of Carbon Quantum Dots as a Biological Sensor for Transgelin-2



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## ABSTRACT

Due to the enormity of different forms of cancer and the increase in cancer rates globally, it is essential to continually develop more advanced methods of early and localized detection of cancer cells, as well as methods of targeted drug delivery. As a result, a vast amount of research has gone into the use of nano-materials such as graphene quantum dots (GQDs) as the basis for a wide variety of biomedical sensing and treatment applications. While many diagnostic biomarkers have been detected using modified GQDs, one biomarker that has not yet been successfully detected or targeted using GQDs is Transgelin-2. Transgelin-2 is a unique actin-binding protein that has been projected to be a useful biomarker and target of treatment for many different forms of cancer, as well as asthma and immune diseases such as lupus. Herein I review the structure of the Transgelin-2 protein, novel methods of GQD modification to sense cell membrane surface proteins, and ultimately determine the viability of GQDs as a method for detecting and targeting Transgelin-2. Furthermore, I develop a possible methodology by which these biophysical applications may be tested.

## INTRODUCTION

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## METHODOLOGY

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## RESULTS

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## RECOMMENDATIONS

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## CONCLUSION

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## ACKNOWLEDGEMENTS

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