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## Development of aptameric sensors for detecting prostate cancer

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Prostate specific antigen (PSA) is a 33-34 kDa glycoprotein commonly used to screen prostate cancer and monitor treatment progression of prostate disease. However, PSA screening test has become controversial due to high percentage of false-positive and false-negative results partially due to the presence of PSA homologs, complex formed with enzyme inhibitor, precursor forms of PSA and degradation products of PSA. Antibodies and mass spectrometry (MS) methods have been developed to specifically quantify PSA in the presence of these variables but have yet to overcome the disadvantage of poor immunoassay reproducibility or requirement of expensive MS instrument. We focus on using DNA aptamers, oligonucleotides that bind specific target analytes with high affinity. Aptamer sensor will specifically quantify PSA with high sensitivity. Specific aptamers against 2 peptides obtained by trypsinolysis of PSA were selected using SELEX method. After 13-19 rounds of selection, five aptamers were screened from a pool of 430 random libraries. The sequenced aptamers were 21-35 nucleotides long. Fluorescence biosensor was made by attaching Quencher to the fluorophore incorporated aptamer. Incubation with the positive target analyte showed increase in fluorescence as the concentration of the target increased. Kd was measured to be 178 nM. If successful, this project will deliver simple, fast and inexpensive fluorescent test for detection of PSA in human samples.

### Biography

Nanami Kikuchi has completed Bachelors of Science degree from Lindenwood University in 2010. She joined University of Central Florida in 2013 and completed Masters of Science degree in May 2015. She is currently pursuing PhD degree in Chemistry at University of Central Florida. She has been teaching general chemistry, organic and biochemical laboratory methods for undergraduate students.

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