



Black Hills Chapter of Sigma Xi presents

A talk by Dr. Yun Seok Choi, Assistant Professor in Chemistry, BHSU

*Protein-based biosensors for a high-throughput drug screening*

When: Wednesday, November 9<sup>th</sup>

Meet and Greet from 3pm to 4pm

Talk from 4pm to 5pm

Where: SD Mines campus Classroom building CB 206-E

## ABSTRACT

Biosensors have been widely used to detect chemicals, biomarkers, proteins, and pathogens. Antibodies are popular protein-based biosensors detecting antigens. Drawbacks of antibodies are difficulty to modify antibodies and low specificities for post-translational modifiers. To overcome these problems, we used rational design strategies to develop protein-based sensors to detect post-translational modifiers.

Nedd8 is a post-translational modifier affecting cell cycle control, protein degradations, and immune responses. The Nedd8 functions are also important for cancer cells to survive and proliferate. Therefore, Nedd8 enzymes are upregulated in some cancer cells. Nedd8 enzymes are, therefore, a drug target. However, there is no efficient high-throughput drug screening method to develop Nedd8 enzyme inhibitors.

My group designed and generated biosensors for free (i.e., unconjugated) Nedd8 with high specificity. We employed fluorescence resonance energy transfer (FRET) and bioluminescence signaling methods for the biosensors to measure target concentrations. Free Nedd8 is a reactant of Nedd8 enzyme and can be a good indicator of the enzyme activity. Therefore, free Nedd8 biosensor can report which drug candidates efficiently inhibit Nedd8 enzyme activities in a high-throughput drug screening.