

Title: Construction of Genetically Encoded FRET-based nanosensor for measurement of Tungsten in Living Cells

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Tungsten (W) is a rare transition heavy metal that is a raising environmental concern due to bioaccumulation in soils and water. There has been a rise in the use of tungsten in industries. This increase in the use of tungsten commercially has increased the exposure to high levels of tungsten. The lack of knowledge regarding human health risks, both the Environmental Protection Agency and the National Toxicology Program have identified tungsten as an emerging toxicant that needs investigation. Recent *In vitro* and animal studies suggest that tungsten toxicity is leading to pulmonary inflammation, development of cancer, increased prevalence of stroke, and diabetes. The lack of an effectively sensitive detecting system has hindered research in this area. Currently, tungsten detection requires expensive equipment (such as ICP-mass spectrometry) with a very little efficiency. Therefore, we need to develop a device that is non-invasive and enables real-time measurement of such heavy metal ions in living cells. Here, we have developed a Genetically Encoded Fluorescence Resonance Energy Transfer (FRET)-based nanosensor, named SENTUN (sensor for tungsten) which contains a metalloregulatory tungsten binding protein (TupA) as the W^{6+} sensing element inserted between the FRET pair enhanced cyan fluorescent protein (ECFP) and Venus. SENTUN provides rapid detection response with high specificity and selectivity and is stable to pH changes. Further, three mutants were created for more efficiency of tungsten detection in both prokaryotes and eukaryotes in a non-invasive manner.

Biography

Rahila Nazir is pursuing her Ph.D. in Molecular Biology from Jamia Hamdard, New Delhi in collaboration with Jamia Millia Islamia University, New Delhi. She is 27 years old and belongs from a beautiful place Kashmir (Jammu and Kashmir), India which is called paradise on earth. She has attended many International and National conferences and has received second prize for the best poster presentation in a National conference. She has published many research papers including a book chapter in reputed journals.

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Session name/ number:
Category: (Poster presentation)