Sewon Eom, Chem Sci J 2018, Volume 9
DOI: 10.4172/2150-3494-C2-021

8th European Chemistry Congress

June 21-23, 2018 | Paris, France

Title: A new class of rhodamine-based fluorescent turn-on probes for ATP monitoring in mitochondria

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ATP acts as a chemical battery that stores energy for cell function. In addition, ATP acts as a symbol of neurotransmission and regulates molecular motion and ion channels. Further, a decrease in ATP can cause hypoglycemia, ischemia and Parkinson's disease. Therefore, real-time monitoring of ATP levels in cells is very significant. We have developed a new class of colorimetric and fluorescent "turn-on" probes based on rhodamine derivatives to detect adenosine-5'-triphosphate (ATP) through hydrogen bond interactions. When 5mM ATP is added, probe 1 has a 65-fold increase in fluorescence intensity and changes from colorless to pink. In addition, Probe 2 has very clear color and fluorescence changes due to the presence of ATP. Experimental results show that this kind of probe has a higher specificity for ATP than other anions, metal ions and other nucleoside polyphosphates except ADP. Enhanced release and visual changes are due to the pH-independent (pH (4.0 to 7.4)) spirolactam ring opening. A more important finding in our results is that the electron-withdrawing group in the chain reduces the ability to bind to ATP. Live cell imaging experiments on Hela cells indicate that probe 2 has cell permeability and is primarily located in the mitochondria.

Biography

Sewon Eom was born in 1994 in Republic of Korea. She received her bachelor's degree in chemistry from Ewha Womans University, Seoul, Korea in 2017. She is currently on MS studies under the supervision of Prof. Juyoung Yoon in the department of chemistry and nano science at Ewha Womans University. Her research interests include fluorescent chemosensors and molecular recognition.

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