Genetically encoded live cell sensor for tyrosinated microtubules

Dr. Minhaj Sirajuddin's laboratory at the cytoskeleton lab in the cardiovascular biology and disease theme at DBT's Institute for Stem Cell Science & Regenerative Medicine (inStem), Bengaluru have developed and validated a live cell sensor against tyrosinated form of microtubules a unique microtubule PTM. The tyrosination sensor reported in this study is the first tubulin nano-body or sensor that can be used to study microtubules PTMs in live cells.

Their research work has also shown the application of this sensor in studying small-molecule (anti-cancer drugs) compounds that target microtubule. Thus, this sensors will facilitate studying microtubule functions for many researchers and will aid identifying new drugs of therapeutic value in future. Further, provisional patenting application has been filed for the commercial use of tyrosination specific sensor; jointly by inStem, Bangalore, India and North Carolina State University, Rayleigh, USA.

Microtubules are cytoskeleton polymers made of alpha/beta tubulin subunits that perform variety of cellular functions such as chromosome segregation, intracellular cargo transport, maintaining cell shape and organization. Many of these microtubule functions are regulated by post-translation modifications (PTMs) that occur in the tubulin subunits. A key limitation in understanding microtubule PTMs in these processes is the lack of tools to study their spatial-temporal organization.

Link: https://www.biorxiv.org/content/10.1101/2020.03.29.013250v1