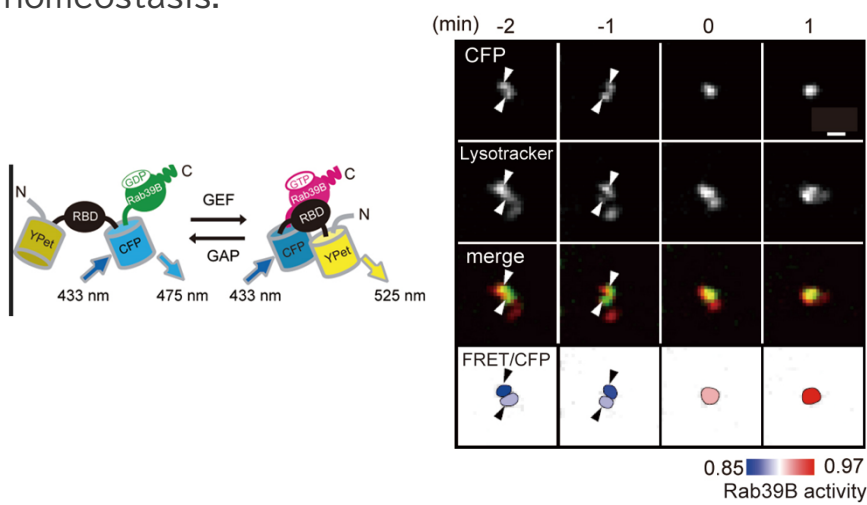


Purpose of Research

X chromosome-linked intellectual disability (XLID) is a neurological and psychiatric disorder whose symptoms include juvenile Parkinson's disease, decreased intellectual capacity, and social behavioral disorder. Rab39B is one of the factors responsible for the disease. Although various effectors of Rab39B have been identified for a variety of symptoms, it is unknown when and where Rab39B binds to specific effectors due to the lack of tools to visualize Rab39B activity. We have developed a FRET sensor that can measure Rab39B activity at the resolution of a single endosome and applied in broad range of physiological and pathological contexts.

Summary of Research

XLID is neurological and psychiatric disorder characterized by juvenile Parkinson's disease (PD), intellectual decline, social and behavioral disorders, and epilepsy caused by mutations in genes on the X chromosome. Although various effectors of Rab39B have been identified for a variety of symptoms, it is unclear when and where Rab39B binds to specific effectors due to the lack of tools to visualize Rab39B activity. We have developed the Rab39B FRET sensor and found that Rab39B is transiently activated during the lysosomal-lysosome fusion process. We consider that this data suggest the roles of Rab39B in lysosome homeostasis.



Comparison with Conventional or Competitive Technologies

Success in visualization of spatio-temporal activity of Rab39B by FRET biosensor – World-first

Expected Applications

This technology is expected to be applied to research and development tools and drug screening for juvenile and sporadic cases (de novo) of PD.

Challenges in Implementation

Efficient drug screening such as FACS is required.

What We Expect from Companies

There are many unknowns about PD, such as DLB, which is an analogous disease, and mixed pathology with Alzheimer's disease. In other words, it can be said that we have entered a phase where rational drug design based on molecular etiology is possible.

Points

- >Success in visualization of the spatio-temporal activity of Rab39B by a novel sensor
- >Possible application to the development of drug screening systems for Parkinson's disease and other diseases by further devising.

Future Developments

Elucidation of the possible etiology of PD involving Rab39B

- Associated System : KAKENHI
- Awards : None
- Intellectual Property : Tokugan2021-137389
- Prototype : O(Presented at conferences)
- Sample : Rab39B FRET sensor