A Novel Reversible Fluorescent Protein Complementation Assay for Imaging of Protein-protein Interactions

Tech ID: 25347 / UC Case 2016-017-0

INVENTION NOVELTY

This invention provides a method for characterizing protein-protein interactions using a novel reversible bimolecular fluorescence complementation assay.

VALUE PROPOSITION

Bimolecular fluorescence complementation assays provide exceptional tools for studying protein-protein interactions in live cells. Until recently, these assays have relied on fluorescent protein fragments that become irreversibly bound following interaction of the proteins of interest. The irreversibility of this assay precludes it from being used to characterize transient protein-protein interactions or testing the effect of inhibitors and other small molecules on protein binding. Therefore, a reversible bimolecular fluorescence complementation assay would be a significant improvement over existing technologies.

This novel invention provides the following advantages:

- An **improved method** for studying protein-protein interactions in **live cells**
- A **reversible** bimolecular fluorescence complementation assay
- **Vectors** that are capable of expressing split fluorescent protein fragments covalently bound to proteins of interest
- A **highly adaptable system** for characterizing interactions between a wide variety of proteins
- A **screening platform** for testing the ability of molecular compounds to disrupt protein binding in live cells

TECHNOLOGY DESCRIPTION

Inventors at the University of California, San Francisco have developed an innovative method to study protein interactions in live cells. This method takes advantage of UnaG, a green fluorescent protein recently isolated from a species of Japanese eel. By engineering a split UnaG protein and incorporating the two fragments into a complementation assay, the inventors have demonstrated that activation of UnaG fluorescence is reversible in the presence of a protein binding inhibitor. The split UnaG fragments can be covalently linked to proteins of interest, expressed in live cells, and fluorescence can be directly measured by

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OTHER INFORMATION

KEYWORDS

UnaG fluorescent protein, Fluorescent protein complementation assay, Live imaging

CATEGORIZED AS

- **Medical**
  - Imaging
  - Research Tools

RELATED CASES

2016-017-0

microscopy to determine temporospatial kinetics of protein binding.

LOOKING FOR PARTNERS

To develop and commercialize this technology as a new method of studying protein-protein interactions in live cells and screening compounds that disrupt protein binding.

STAGE OF DEVELOPMENT

Proof of Concept

RELATED MATERIALS

- To TL, Zhang Q, Shu X.Protein Sci. 2015 Dec 21. (2015) Structure-guided design of a reversible fluorogenic reporter of protein-protein interactions. Protein Sci. 2015 Dec 21.

DATA AVAILABILITY

Under a CDA/CDA

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- “SPARK (Separation of Phases-based Activity Reporter of Kinase)”_A Genetically-encoded Fluorescent Reporter Platform for Studying Cell Signaling in Living Cells
- INFRARED FLUORESCENT PROTEASE REPORTERS FOR DEEP TISSUE IMAGING

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