Functional Illumination in Living Cells

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ABSTRACT

Researchers at the University of California, Davis, have developed a novel method of developing a wide array of small functional illuminants that do not hinder cell function.

FULL DESCRIPTION

In the last decade, applications of genetically encoded fluorescent probes and sensors in molecular imaging have greatly improved our understanding about specific molecules cellular functions and how errant cells cause diseases. Green fluorescent protein and its relatives of color palettes (FPs) have been successfully employed in a broad range of biological disciplines, reporting the distribution, abundance, dynamics, interaction, and conformational changes of essential signaling molecules in time and space using uniquely engineered FP chimeras. Due to their large size, FPs inherently have a low level of fluorescence due to improper folding of chimeras, or highly unstable fusion complexes as well as inhibited host protein function due to altered 3-D folding of proteins.

Researchers at the University of California, Davis have developed a novel methodology to create small functional, dye based, illuminants to make the spatiotemporal regulation of cell signaling visible, which cannot be otherwise achieved with current methods. These small functional illuminants are small ranging from 1,000 Daltons to 1,200 Daltons, which lends themselves to be inserted along the sequence of proteins without interfering with their evolved physiological functions.

APPLICATIONS

- Developing novel small genetic illuminants which will expand the catalogue of fluorescence imaging tools, with added versatility

FEATURES/BENEFITS

- Small in size (1-1.2 KDa) than available cell imagining tools
- Readily inserted along the sequence of the proteins without interfering with their function
- Broad color spectrum of colors which can further expand to the infrared spectrum, allowing multiplex and whole animal imaging
- Do not require maturation time like GFP
- Capable of using multiple dyes
- Easy to screen wish desired modifications

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,598,667	03/24/2020	2013-390

Additional Patent Pending

INVENTORS

- Ahadi, Sara
- Lam, Kit S.
- Liu, Rui
- Tian, Lin

OTHER INFORMATION

CATEGORIZED AS

- **Biotechnology**
  - Industrial/ Energy
  - Other
  - Proteomics
- **Imaging**
  - Molecular
- **Materials & Chemicals**
  - Biological
  - Chemicals
- **Research Tools**
  - Protein Synthesis
  - Reagents

RELATED CASES

2013-390-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Novel Solid Tumor Chemodrug LLS2
- Affinity Peptides for Diagnosis and Treatment of Severe Acute Respiratory Syndrome Coronavirus 2 and Zika Virus Infections
- Nanoparticles for Drug Delivery, Tissue Targeting and Imaging Analysis
- Conjugates That Combine HDAC Inhibitors and Retinoids into Disease Preventatives/Treatments
- A Novel RGD-Containing Cyclic Peptide for use in Cancer Imaging and as a Targeted-Therapy Ligand
- Site-Specific Ligation and Compound Conjugation to Existing Antibodies
- Multifunctional Porphyrin-Based Nanomedicine Platform
- A Two-step Drug Delivery System Based on Click Chemistry

- Transformable Smart Peptides as Cancer Therapeutics
- Engineered Biomaterial to Prevent Endothelial Inflammation
- Programmable Peptide Nucleic Acid-Based Nanoplatform for Customizable Drug Delivery
- GPCR Screening Method to Identify Non-Hallucinogenic Compounds
- Systems and Methods of Single-Cell Segmentation and Spatial Multiomics Analyses
- Genetically Encoded Fluorescent Sensors for Probing the Action of G-Protein Coupled Receptors (GPCRs)
- Proteoglycan Mimetics For Enhanced Wound Healing Angiogenesis And Vascular Repair
- Nanoplatform for Cancer Therapy
- Ligands for Improved Angiogenesis and Endothelialization of Blood Contacting Devices

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