New Bright Green Fluorescent Proteins

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BACKGROUND

Fluorescent proteins (FP) have been widely used as research tools in both academia and pharma for many years. Naturally occurring FP have been mutated to either be brighter, be monomers, and/or for easier folding and expression in cells. The most common FP to date has been the green fluorescent protein (GFP) of the jelly fish *Aequorea victoria* which can be expressed in cells and fused with proteins of interest, and has proven to be an excellent tool to study protein localization, expression, signaling, etc. in real time via microscopy and other techniques.

TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have identified a very bright wild-type green fluorescent protein in *Aequorea* cf. *australis*, AausFP1 (also referred as AbbFP1 and GalLarvFP1). Although most naturally occurring fluorescent proteins (FP) are usually dimers or tetramers, it is easier to use these in experiments by expressing these in cells as monomers, provided these conserve certain optical properties. The inventors have engineered various mutants to improve the wild-type FP behavior in cells while maintaining its remarkable optical properties. For example, the inventors engineered mutants that appear not to photobleach, have narrow excitation and emission spectra, and are much brighter than the gold standard EGFP. The inventors are optimizing the mutants and are also trying to engineer other colors like yellow or cyan. The mutants do not seem to affect cell viability, division or motility.

APPLICATIONS

The invention involves the development of fluorescent proteins that can be used as genetically encoded reporters of gene expression, protein localization, and many other live-cell imaging applications

ADVANTAGES

The newly developed fluorescent proteins are substantially brighter than existing fluorescent proteins as EGFP (mAbb0.5, the current iteration, is approximately 4-fold brighter than EGFP, and tdAausFP1.1, a tandem dimer variant, is approximately 10-fold brighter than EGFP). The tandem dimer also exhibits no measurable photobleaching.

STATE OF DEVELOPMENT

At experimental stage (working prototype).

INTELLECTUAL PROPERTY INFO

The invention is patent pending and is available for licensing.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Gene function studies, protein localization, report assays, fluorescent proteins, live-cell imaging

CATEGORIZED AS

- **Imaging**
  - Molecular
- **Materials & Chemicals**
  - Biological
- **Medical**
  - Imaging
- **Research Tools**
  - Expression System

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