Docket #: S04-201

Mutated Renilla Luciferase For Higher Light Output and Altered Stability

Stanford researchers have developed mutant Renilla luciferase proteins and reporter gene constructs which modify the physical characteristics of the Renilla luciferase protein for use in biological assays. The mutant Renilla Luciferases contain specific mutations which confer altered protein stability and enhanced light output. For reporter gene applications, a mutant can be choosen with the appropriate level of stability for either transient or constitutive applications. The stabilized variants have potential for use as bioluminescent tags for both in vivo and in vitro applications.

Figure

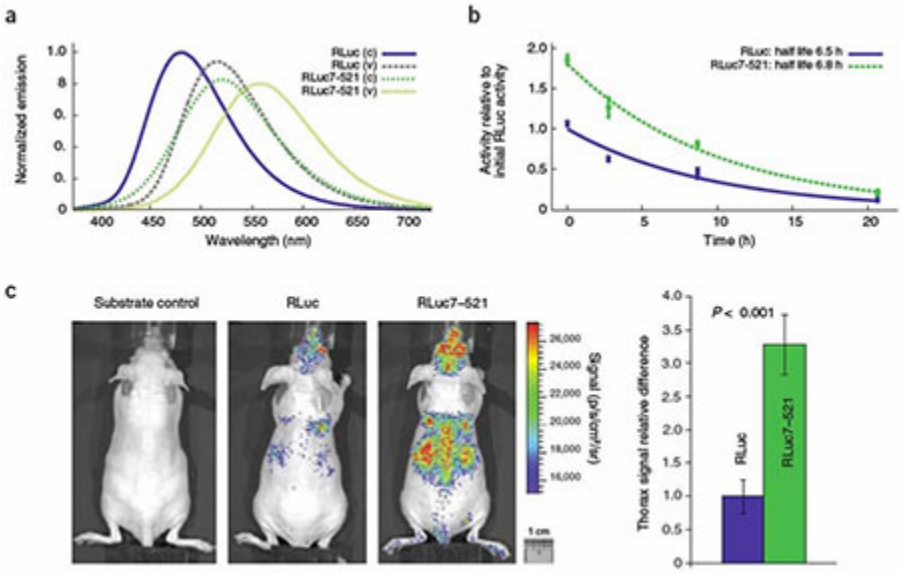

Figure description - RLuc7-521 experimental validation

Stage of Research

Validated red-shifted variant of RLuc (RLuc7-521) for transient reporter gene imaging

Applications

- Bioluminescent tag for use in vivo and in vitro assays
- Reporter gene for use in tracking gene therapy
- Mutant luciferases with different photophysical characteristics for use in BRET systems
- Commercial applications requiring luminescent materials

Advantages

- Mutant luciferase proteins have alterations in stability from 0.5 - 150 fold of the native enzyme.
- Mutant luciferase proteins show between 4 fold and 60 fold enhancements in light output when used with native substrate and various analogs.
- Reporter gene systems can be optimized with tunable levels of stability.

Publications

- Loening AM, Fenn TD, Wu AM, Gambhir SS. Consensus guided mutagenesis of Renilla luciferase yields enhanced stability and light output Protein Engineering Design and Selection, 2006 May; 19(9):391-400.
- Loening AM, Wu AM, Gambhir SS. Red-shifted Renilla reniformis luciferase variants for imaging in living subjects. Nat Methods. 2007 Aug; 4(8):641-3.
- Loening AM, Dragulescu-Andrasi A, Gambhir SS. A red-shifted Renilla luciferase for transient reporter-gene expression. Nat Methods. 2010 Jan; 7(1):5-6.

Patents

- Published Application: WO2007030473
- Published Application: 20090136998
- Published Application: 20110229955
- Published Application: 20120178141
- Published Application: 20120295326
- Issued: 7,939,649 (USA)

- Issued: 8,173,791 (USA)
- Issued: 8,258,277 (USA)
- Issued: 8,378,086 (USA)

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