



Reflectins, a Protein Family of Reflective Squid Tissues

Tech ID: 21719 / UC Case 2005-488-0

SUMMARY

UCLA and University of Hawaii researchers have discovered a novel protein family with unique iridescent and reflective properties.

BACKGROUND

Reflective tissue can be found in many marine animals. This biological advantage protects the animals from predators by altering incident light and changing visibility. In many aquatic animals this is achieved through accumulation of purine crystals in the reflector platelets. Uniquely, squids express reflectins, a protein family, which confers the reflectivity characteristics. Improved understanding of reflectivity traits may promote technical advances in bioreflectors, biological tracers, and many other technologies requiring visualization of nanoscale structures.

INNOVATION

Dr. Joseph Horwitz from UCLA’s Jules Stein Eye Institute and colleagues from the University of Hawaii have discovered a unique protein family in squid that possesses distinctive iridescent and reflective characteristics and that are sensitive to chemical stimulation. Other forms of reflectivity in animal tissues are achieved with non-protein based molecules, such as purines, and reflectivity is therefore static in these tissues. The reflectins, on the other hand, are proteins and retain the ability to be expressed variably as well as statically. The reflectins are therefore ideal candidates for protein engineering purposes and have potential utility in biological marker development, assay development, the fabrication of photonic crystal and bandgap devices, as well as in the organization of nanomaterial.

APPLICATIONS

- ▶ Micro- or nanoscale bioreflectors for use in photoactive devices
- ▶ Reflective materials for camouflage
- ▶ Biomarker detection or protein expression marker

ADVANTAGES

- ▶ Small protein size simplifies in vitro expression.
- ▶ Iridescence and reflectivity properties are responsive to chemical signals.
- ▶ Uniquely the reflective characteristics are variable and static.

STATE OF DEVELOPMENT

Validation in cell culture systems.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,314,735	01/01/2008	2005-488

RELATED MATERIALS

- ▶ Reflectins: the unusual proteins of Squid Reflective Tissues. *Science*. (2004)
- ▶ The self-organizing properties of squid reflectin protein. *Nature Materials*. (2007)

CONTACT

UCLA Technology Development Group
ncd@tdg.ucla.edu
tel: 310.794.0558.



INVENTORS

- ▶ Horwitz, Joseph

OTHER INFORMATION

KEYWORDS

Research Tools, protein-based reflection, high refractive index material, ectopic expression, detection of gene expression, variable iridescence reflectjoeivity, amino acid, repeating domains, rare amino acids

CATEGORIZED AS

- ▶ **Materials & Chemicals**
 - ▶ Biological
- ▶ **Research Tools**
 - ▶ Reagents

RELATED CASES

2005-488-0

UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

tdg.ucla.edu

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

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