Bring to Structure to Green Fluorescent Protein

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Abstract

About 50 years ago, the wild type green fluorescent protein(wtGFP) was discoverd by scientists. Then wtGFP are transfered and expressed in animal. New and enhanced green fluorescent protein were created by mutasis. Now more and more different green fluorescent protein(GFP) variants are developed and used in different expriments. In order to draw a picture between function and strcuture, we will review the classical and some popular GFP variants. We will focus on how the structure dependent the paramenters of fluorescent.

Introduction

In 1962, Osamu Shimomura noticed that a kind of jelly has the fluorescent. Then the results of fluorescent was found out and wtGFP was isolated from jelly. At about 1992, scientists found out the GFP gene, then GFP was expressed in *C. elegans* by Martin Chalfie in the first time. After the crystal stcucture of GFP was sloved, Roger Y.Tsien and other scientists developent more brightness, colorful GFP variants.

Based on above work, biologists uses various fluorescent protein in research. Fluorescent protein are efficent genetic markers, indicators inside cell, even contribution to the super resulution microscopy.

Each fluorescent protein has unique fluorscent property. Firstly, we based on the classical wild type green fluorescent protein to find out how it form and provide fluorescence. Then, by comparaing different mutasis green fluorescent protein variants, we try to find what is the major to change the fluorescent parameters.

The Structure and Formation of wtGFP

wtGFP contains 11 strands of β-sheets , a α-helices caps which running through the center and fluorophore in the centre. In nature condication, wtGFP existes in the form of dimer. In cell, wtGFP is produce in ..., and compent in ...., and transer to .... The β-barrel is form by the process ....

The fluorophore is key part in wtGFP, which is result after cyclizatino and oxygenation by catalyticed by β-barrel. The detain is ...

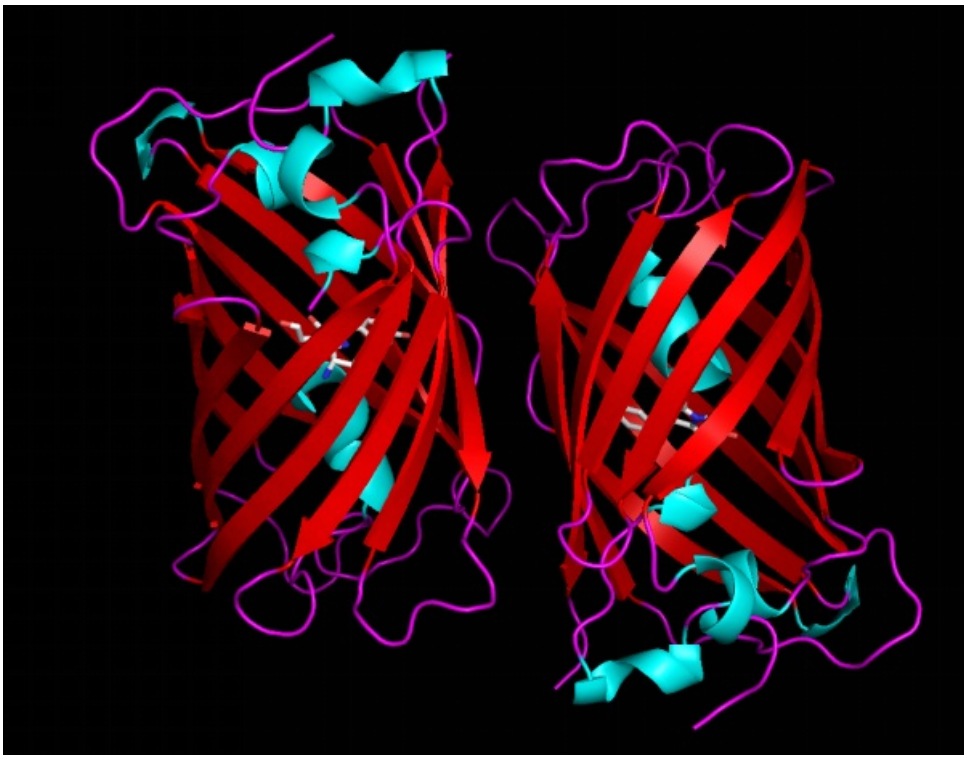

Figure 1. The structure of wtGFP(PDB: 1GFL)

The Generation of Fluorescene

How the structure change the parameter of light

Summary

References