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Catalogue# Prot-r-mCherry: Purified recombinant mCherry

Background: mCherry is derived from proteins originally isolated from Cnidarians (jelly fish, sea anemones and corals), and is used as a fluorescent tracer in transfection and transgenic experiments. The prototype for these fluorescent proteins is Green Fluorescent Protein (GFP), which is a ~27 kDa protein isolated originally from the jellyfish *Aequoria victoria*. GFP was the basis of the 2008 Nobel Prize in Chemistry, awarded to Osamu Shimomura, Martin Chalfie and Roger Tsien, specifically "for the discovery and development of the green fluorescent protein, GFP". GFP was shown to fluoresce on contact with molecular oxygen, requiring no other cofactors, and so can be expressed in fluorescent form in essentially any prokaryotic or eukaryotic cell.

The mCherry protein is derived from DsRed, a red fluorescent protein from so-called disc corals of the genus *Discosoma.* DsRed is similar in size and properties to GFP, but, obviously, produces a red rather than a green fluorochrome. The original DsRed was engineered extensively in the Tsien lab to prevent it from forming tetramers and dimers and to modify and improve the spectral properties (1-3). Several further cycles of mutation, directed modification and evolutionary selection produced mCherry, which has an excitation maximum at 587 nm and emission maximum at 610 nm (4).

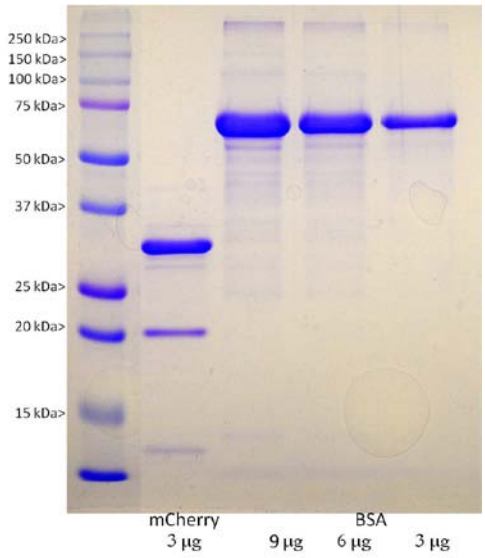

Figure: His-tagged recombinant mCherry was run out on an SDS-PAGE gel at 3 µg in the second lane. BSA was also run at 9 µg, 6 µg and 3 µg per lane as indicated. The vector adds an C-terminal His-tag which was use to purify the protein and this, along with some other vector derived sequence, adds about 5 kDa to the molecule, which therefore runs at about 34 kDa. The lane on the left contains Biorad SDS-PAGE molecular weight standards of the indicated size.

Protein Characteristics: We generated a cDNA encoding the mCherry protein and expressed this in E. coli. The vector adds an C-terminal His-tag which was use to purify the protein and this, along with some other vector derived sequence, adds about 5 kDa to the molecule. The construct therefore has a total size of about 34 kDa as shown.

References:

1. Baird GS, Zacharias DA, Tsien RY. Biochemistry, mutagenesis, and oligomerization of DsRed, a red fluorescent protein from coral. Proc Natl Acad Sci U S A. 97:11984-9 (2000).

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3. Heikal AA, Hess ST, Baird GS, Tsien RY, Webb WW. Molecular spectroscopy and dynamics of intrinsically fluorescent proteins: coral red (dsRed) and yellow (Citrine). Proc Natl Acad Sci U S A. 97:11996-2001 (2000).

4. Shaner NC, Campbell RE, Steinbach PA, Giepmans BN, Palmer AE, Tsien RY. Improved monomeric red, orange and yellow fluorescent proteins derived from Discosoma sp. red fluorescent protein. Nature Biotechnology 22:1567-1572 (2004).

Limitations: This product is for research use only and is not approved for use in humans or in clinical diagnosis.