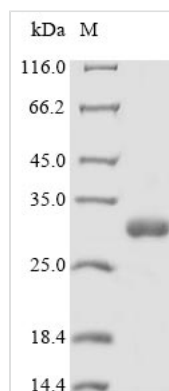




Recombinant Synsepalum dulcificum Miraculin

Product Code	CSB-YP320179RES
Relevance	Miraculin has the property of modifying a sour taste into a sweet taste. This alteration of taste perception persists for many minutes.
Abbreviation	Recombinant Synsepalum dulcificum Miraculin protein
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P13087
Product Type	Recombinant Protein
Immunogen Species	Synsepalum dulcificum (Miracle fruit) (Richadella dulcifica)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	DSAPNPVLIDIDGEKLRTGTNYIYVPVLRDHGGGLTVSATTPNGTFVCPPRVVQ TRKEVDHDRPLAFFPENPKEDVVRVSTDNLNINFSAFMPCRWTSSSTVWRLDKY DESGQYFVTIGGVKGNPGPETISSWFKIEEFCGSGFYKLVFCPTVCGSCKVK CGDVGIYIDQKGRRRLALSDKPFAFEFNKTVYF
Research Area	others
Source	Yeast
Protein Names	Recommended name: Miraculin Short name= MIR
Expression Region	30-220aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	23.4kDa
Protein Length	Full Length of Mature Protein

Image



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description



The generation of recombinant *Synsepalum dulcificum* Miraculin in yeast begins with co-cloning the target gene (30-220aa of *Synsepalum dulcificum* Miraculin) into an expression vector with an N-terminal 6xHis-tag gene and transforming it into yeast cells. The yeast cells are cultured under conditions that induce protein expression. After sufficient growth, the cells are lysed to release the recombinant protein. The recombinant *Synsepalum dulcificum* Miraculin is purified from the cell lysate through affinity chromatography. Its purity is assessed using SDS-PAGE, exceeding 85%.

Miraculin is a taste-modifying protein derived from the miracle fruit, *Synsepalum dulcificum*. This protein interacts with human sweet-taste receptors, causing sour flavors to be perceived as sweet [1][2][3]. The miracle fruit, known for its miraculous sweetening glycoprotein, miraculin, has the unique ability to alter sour tastes into sweet ones when consumed [4][5][2]. This taste-altering effect has been studied extensively, showing that miraculin can temporarily and almost completely replace sour tastes with sweet ones [1]. The glycoprotein miraculin found in *Synsepalum dulcificum* has been shown to positively impact the palatability of various substances, making sour or bitter tastes more enjoyable by transforming them into sweet perceptions [5].

The glycoprotein miraculin in *Synsepalum dulcificum* has been of interest not only for its taste-modifying properties but also for its potential nutritional benefits and medicinal uses [3]. Studies have highlighted the unique taste-modifying property of the fruit due to the presence of miraculin, making it a peculiar medicinal plant with significant potential [3]. Additionally, research has shown that miraculin from *Synsepalum dulcificum* can induce differential sweetness in various sour liquids, further emphasizing its role in taste perception [2].

References:

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- [2] G. Igarashi, R. Higuchi, T. Yamazaki, N. Ito, I. Ashida, & Y. Miyaoka, Differential sweetness of commercial sour liquids elicited by miracle fruit in healthy young adults, *Food Science and Technology International*, vol. 19, no. 3, p. 243-249, 2013. <https://doi.org/10.1177/1082013212443060>
- [3] A. Akinmoladun, A. Adetuyi, K. Komolafe, & O. Oguntibeju, Nutritional benefits, phytochemical constituents, ethnomedicinal uses and biological properties of miracle fruit plant (*synsepalum dulcificum* shumach. & thonn. daniell), *Heliyon*, vol. 6, no. 12, p. e05837, 2020. <https://doi.org/10.1016/j.heliyon.2020.e05837>
- [4] Z. Yang, Z. Liu, H. Xu, Y. Chen, P. Du, P. Liet al., The chromosome-level genome of miracle fruit (*synsepalum dulcificum*) provides new insights into the evolution and function of miraculin, *Frontiers in Plant Science*, vol. 12, 2022. <https://doi.org/10.3389/fpls.2021.804662>
- [5] L. López, M. Vela, I. Ibarra, L. Díaz, L. Belmont, & S. Guillén, Positive improvement in palatability of metabolic formula with the use of miraculin protein in patients with inborn errors of metabolism and healthy adults, *Revista Chilena De Nutrición*, vol. 47, no. 5, p. 801-807, 2020. <https://doi.org/10.4067/s0717-75182020000500801>



Reconstitution

We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL. We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.

Shelf Life

The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.