

## Product Specification Sheet

**Product Name:** Riboflavin-binding protein from chicken egg white

EC number: not an enzyme

CAS registry number: 91386-80-0

MDL number: MFCD00132179

**Catalog Number:** FSB1004

**Lot Number:** 06B21

### Description

Riboflavin-binding protein (RfBP) is a 219 amino acid glycoprotein from chicken egg white [1], which is composed of two distinct domains, riboflavin binding domain and a C-terminal phosphoserine domain. The riboflavin-binding domain is composed of four helices that are held together by 8 cystine bonds and binds one riboflavin molecule [2, 3]. The C-terminal phosphoserine domain is composed of two helices held together by 1 cystine bond and has eight phosphorylation sites [2, 3]. The combination of Trypsin digestion and subsequent treatment with PGNaseF and neuraminidase show that the ligand-binding domain is glycosylated at residues N36 and N147 and that both sites have multiply sialylation [4]. Riboflavin has a bright yellow absorbance maximum near 455 nm [10] that can be fluorescence quenched by tryptophan when it binds to the active protein [11].

RfBP binds a riboflavin molecule whose transport is required for oocyte development [9]. Furthermore, the phosphoserine domain of RfBP binds to a lipoprotein receptor of oocytes in association with Vitellogenin and calcium that is absorbed into oocytes [12]. Riboflavin binding protein is an ideal model protein for understanding oxidative protein folding because riboflavin can both catalyze oxidative formation of cystine bonds and can be used to monitor protein folding by fluorescence quenching [13].

### Product Information

Quantity:	3 mg
Purity:	> 95% by SDS-PAGE
Molecular Weight:	~29.2 kDa Glycosylated, ~27.2 kDa Deglycosylated [5], ~34 kDa Apparent [6]
Riboflavin Abs:	Molar Absorption Coef. A <sub>455 nm</sub> 12,500 M <sup>-1</sup> cm <sup>-1</sup>
RfBP Abs:	Molar Absorption Coef. A <sub>282 nm</sub> 49,000 M <sup>-1</sup> cm <sup>-1</sup>
PI:	~5.0-5.2 [8]
T <sub>m</sub> :	67°C [7]
Storage:	<b>Format:</b> Liquid <b>Buffer:</b> 20 mM Tris – pH 8.0, 10 mM NaCl <b>Temperature:</b> 4 °C <b>Stability:</b> 1 year

***For research use only. Not for use in humans.***

## References

- |    |                               |   |
|----|-------------------------------|---|
| 1  | AA sequence                   | Hamazume Y, Mega T, Ikenaka T. (1984) <b>Characterization of hen egg white- and yolk-riboflavin binding proteins and amino acid sequence of egg white-riboflavin binding protein</b> <i>J Biochem.</i> 95(6):1633-44  |
| 2  | RfBP Domains                  | Wasylewski M. (2004) <b>Evaluation of riboflavin binding protein domain interaction using differential scanning calorimetry</b> <i>Biochim Biophys Acta</i> 1702(2):137-43  |
| 3  | Crystal Structure             | Monaco HL. (1997) <b>Crystal structure of chicken riboflavin-binding protein</b> <i>EMBO J.</i> 16(7):1475-83   |
| 4  | Glycosylation PGNase Analysis | Rohrer JS, White HB 3rd. (1992) <b>Separation and characterization of the two Asn-linked glycosylation sites of chicken serum riboflavin-binding protein. Glycosylation differences despite similarity of primary structure</b> <i>Biochem J.</i> 285 (Pt 1):275-80 |
| 5  | Glycosylation Structure       | Amoresano A, Brancaccio A, Andolfo A, Perduca M, Monaco HL, Marino G. (1999) <b>The carbohydrates of the isoforms of three avian riboflavin-binding proteins</b> <i>Eur J Biochem</i> 263(3):849-58   |
| 6  | Apparent MW                   | Rhodes MB, Bennett N, Feeney RE. (1959) <b>The flavoprotein-apoprotein system of egg white</b> <i>J Biol Chem.</i> 234(8):2054-60   |
| 7  | Denaturation Temperature      | Wasylewski M. (2000) <b>Binding study of riboflavin-binding protein with riboflavin and its analogues by differential scanning calorimetry</b> <i>J Protein Chem</i> 19(6):523-8  |
| 8  | Isoelectric Point             | Guérin-Dubiard C, Pasco M, Mollé D, Désert C, Croguennec T, Nau F. (2006) <b>Proteomic analysis of hen egg white</b> <i>J Agric Food Chem.</i> 54(11):3901-10   |
| 9  | Riboflavin Transport          | White HB 3rd, Armstrong J, Whitehead CC. (1986) <b>Riboflavin-binding protein. Concentration and fractional saturation in chicken eggs as a function of dietary riboflavin</b> <i>Biochem J.</i> 238(3):671-5   |
| 10 | Riboflavin Absorbance         | Allen S, Stevens L, Duncan D, Kelly SM, Price NC. (1992) <b>Unfolding and refolding of hen egg-white riboflavin binding protein</b> <i>Int J Biol Macromol.</i> 14(6):333-7   |
| 11 | Tryptophan Quenching          | McClelland DA, McLaughlin SH, Freedman RB, Price NC. (1995) <b>The refolding of hen egg white riboflavin-binding protein: effect of protein disulphide isomerase on the reoxidation of the reduced protein</b> <i>Biochem J</i> 311 ( Pt 1):133-7                   |
| 12 | Phosphoserine function        | MacLachlan I, Nimpf J, Schneider WJ. (1994) <b>Avian riboflavin binding protein binds to lipoprotein receptors in association with vitellogenin</b> <i>J Biol Chem.</i> 269(39):24127-32  |
| 13 | Protein folding modeling      | Kodali VK, Thorpe C. (2010) <b>Oxidative protein folding and the Quiescin-sulphydryl oxidase family of flavoproteins</b> <i>Antioxid Redox Signal.</i> 13(8):1217-30  |

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