

## Product Information

### Lectin from *Vicia villosa*

Product Number **L 4011**  
Storage Temperature 2-8 °C

#### Product Description

Lectins are proteins or glycoproteins of non-immune origin that agglutinate cells and/or precipitate complex carbohydrates. Lectins are capable of binding glycoproteins even in presence of various detergents.<sup>1</sup> The agglutination activity of these highly specific carbohydrate-binding molecules is usually inhibited by a simple monosaccharide, but for some lectins, di, tri, and even polysaccharides are required.

Lectins are isolated from a wide variety of natural sources, including seeds, plant roots and bark, fungi, bacteria, seaweed and sponges, mollusks, fish eggs, body fluids of invertebrates and lower vertebrates, and from mammalian cell membranes. The precise physiological role of lectins in nature is still unknown, but they have proved to be very valuable in a wide variety of applications *in vitro*, including:

1. blood grouping and erythrocyte polyagglutination studies.
2. mitogenic stimulation of lymphocytes.
3. lymphocyte subpopulation studies.
4. fractionation of cells and other particles.
5. histochemical studies of normal and pathological conditions.

Sigma offers a range of lectins suitable for the above applications. Most Sigma lectins are highly purified by affinity chromatography, but some are offered as purified or partially purified lectins, suitable for specific applications.

Many of the lectins are available conjugated to (conjugation does not alter the specificity of the lectin):

1. fluorochromes (for detection by fluorimetry).
2. enzymes (for enzyme-linked assays).
3. insoluble matrices (for use as affinity media).

Please refer to the table for general information on the most common lectins.

This lectin product contains isolectins B4 and A4, but the presence of other isolectins, can't be ruled out since they may not separate by SDS-PAGE. Isolectins A2 and B2 may be present. However, isolectins B4 and A4 are considered to be the predominating isolectins in this product.

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

This product is soluble in water (1 mg/ml), yielding a clear, colorless solution.

| Lectin                            | MW (kDa)             | Subunits           | Specificity    |                                       | Mitogenic Activity |
|-----------------------------------|----------------------|--------------------|----------------|---------------------------------------|--------------------|
|                                   |                      |                    | Blood Group    | Sugar                                 |                    |
| <i>Abrus precatorius</i>          |                      |                    | —              |                                       | +                  |
| Agglutinin                        | 134                  | 4                  |                | gal                                   |                    |
| Abrin A (toxin)                   | 60                   | 2                  |                | gal                                   |                    |
| Abrin B (toxin)                   | 63.8                 | 2( $\alpha\beta$ ) |                | gal                                   |                    |
| <i>Agarius bisporus</i>           | 58.5                 | —                  | —              | $\beta$ -gal(1 $\rightarrow$ 3)galNAc |                    |
| <i>Anguilla anguilla</i>          | 40                   | 2                  | H              | $\alpha$ -L-Fuc                       |                    |
| <i>Arachis hypogaea</i>           | 120                  | 4                  | T              | $\beta$ -gal(1 $\rightarrow$ 3)galNAc |                    |
| <i>Artocarpus integrifolia</i>    | 42                   | 4                  | T              | $\alpha$ -gal $\rightarrow$ OMe       | +                  |
| <i>Bandeiraea simplicifolia</i>   |                      |                    |                |                                       |                    |
| BS-I                              | 114                  | 4                  | A, B           | $\alpha$ -gal, $\alpha$ -galNAc       |                    |
| BS-I-A <sub>4</sub>               | 114                  | 4                  | A              | $\alpha$ -galNAc                      |                    |
| BS-I-B <sub>4</sub>               | 114                  | 4                  | B              | $\alpha$ -gal                         |                    |
| BS-II                             | 113                  | 4                  | acq, B, Tk, T  | glcNAc                                |                    |
| <i>Bauhinia purpurea</i>          | 195                  | 4                  | —              | $\beta$ -gal(1 $\rightarrow$ 3)galNAc | +                  |
| <i>Caragana arborescens</i>       | 60; 120 <sup>a</sup> | 2/4                | —              | galNAc                                |                    |
| <i>Cicer arietinum</i>            | 44                   | 2                  | —              | fetuin                                |                    |
| <i>Codium fragile</i>             | 60                   | 4                  | —              | galNAc                                |                    |
| Concanavalin A                    | 102                  | 4                  | —              | $\alpha$ -man, $\alpha$ -glc          | +                  |
| Succinyl-Concanavalin A           | 51                   | 2                  | —              | $\alpha$ -man, $\alpha$ -glc          | + <sup>b</sup>     |
| <i>Cytisus scoparius</i>          | —                    | —                  | —              | galNAc, gal                           |                    |
| <i>Datura stramonium</i>          | 86                   | 2( $\alpha\beta$ ) | —              | (glcNAc) <sub>2</sub>                 |                    |
| <i>Dolichos biflorus</i>          | 140                  | 4                  | A <sub>1</sub> | $\alpha$ -galNAc                      |                    |
| <i>Erythrina corallodendron</i>   | 60                   | 2                  | —              | $\beta$ -gal(1 $\rightarrow$ 4)glcNAc | +                  |
| <i>Erythrina cristagalli</i>      | 56.8                 | 2( $\alpha\beta$ ) | —              | $\beta$ -gal(1 $\rightarrow$ 4)glcNAc |                    |
| <i>Euonymus europaeus</i>         | 166                  | 4( $\alpha\beta$ ) | B, H           | $\alpha$ -gal(1 $\rightarrow$ 3)gal   | +                  |
| <i>Galanthus nivalis</i>          | 52                   | 4                  | (h)            | non-reduc. $\alpha$ -man              |                    |
| <i>Glycine max</i>                | 110                  | 4                  | —              | galNAc                                | + <sup>c</sup>     |
| <i>Helix aspersa</i>              | 79                   | —                  | A              | galNAc                                |                    |
| <i>Helix pomatia</i>              | 79                   | 6                  | A              | galNAc                                |                    |
| <i>Lathyrus odoratus</i>          | 40-43                | 4( $\alpha\beta$ ) | —              | $\alpha$ -man                         | +                  |
| <i>Lens culinaris</i>             | 49                   | 2                  | —              | $\alpha$ -man                         | +                  |
| <i>Limulus polyphemus</i>         | 400                  | 18                 | —              | NeuNAc                                |                    |
| Bacterial agglutinin              | —                    | —                  | —              | galNAc, glcNAc                        |                    |
| <i>Lycopersicon esculentum</i>    | 71                   | —                  | —              | (glcNAc) <sub>3</sub>                 |                    |
| <i>Maackia amurensis</i>          | 130                  | 2( $\alpha\beta$ ) | O              | sialic acid                           | +                  |
| <i>Maclura pomifera</i>           | 40-43                | 2( $\alpha\beta$ ) | —              | $\alpha$ -gal, $\alpha$ -galNAc       |                    |
| <i>Momordica charantia</i>        | 115-129              | 4( $\alpha\beta$ ) | —              | gal, galNAc                           |                    |
| <i>Naja mocambique mocambique</i> | —                    | —                  | —              | —                                     |                    |
| <i>Naja naja kaouthia</i>         | —                    | —                  | —              | —                                     |                    |
| <i>Narcissus pseudonarcissus</i>  | 26                   | 2                  | (h)            | $\alpha$ -D-man                       |                    |
| <i>Persea americana</i>           | —                    | —                  | —              | —                                     |                    |
| <i>Phaseolus coccineus</i>        | 112                  | 4                  | —              | —                                     |                    |
| <i>Phaseolus limensis</i>         | 247(II)              | 8                  | A              | galNAc                                | +                  |
|                                   | 124(III)             | 4                  |                |                                       |                    |
| <i>Phaseolus vulgaris</i>         |                      |                    |                |                                       |                    |
| PHA-E                             | 128                  | 4                  | —              | oligosaccharide                       | +                  |
| PHA-L                             | 128                  | 4                  | —              | oligosaccharide                       | +                  |
| PHA-P                             |                      |                    |                |                                       |                    |
| PHA-M                             |                      |                    |                |                                       |                    |

----- Table continued on next page -----

| Lectin                             | MW (kDa)             | Subunits | Specificity                    |                                | Mitogenic Activity |
|------------------------------------|----------------------|----------|--------------------------------|--------------------------------|--------------------|
|                                    |                      |          | Blood Group                    | Sugar                          |                    |
| <i>Phytolacca americana</i>        | 32                   | —        | —                              | (glcNAc) <sub>3</sub>          | +                  |
| <i>Pisum sativum</i>               | 49                   | 4(αβ)    | —                              | α-man                          | +                  |
| <i>Pseudomonas aeruginosa PA-I</i> | 13-13.7              | —        | —                              | gal                            | + <sup>c</sup>     |
| <i>Psophocarpus tetragonolobus</i> | 35                   | 1        | —                              | galNAc, gal                    |                    |
| <i>Ptilota plumosa</i>             | 65; 170              | —        | B                              | α-gal                          |                    |
| <i>Ricinus communis</i>            |                      |          |                                |                                |                    |
| Toxin, RCA <sub>60</sub>           | 60                   | 2        | —                              | galNAc, β-gal                  |                    |
| Toxin, RCA <sub>120</sub>          | 120                  | 4        | —                              | β-gal                          |                    |
| <i>Sambucus nigra</i>              | 140                  | 4(αβ)    | —                              | αNeuNAC(2→6)gal                | + <sup>c</sup>     |
|                                    |                      |          |                                | galNAc                         |                    |
| <i>Solanum tuberosum</i>           | 50; 100 <sup>a</sup> | 1, 2     | —                              | (glcNAc) <sub>3</sub>          |                    |
| <i>Sophora japonica</i>            | 133                  | 4        | A, B                           | β-galNAc                       |                    |
| <i>Tetragonolobus purpureas</i>    | 120(A)               | 4        | H                              | α-L-fuc                        |                    |
|                                    | 58(BA)               | 2        | H                              | α-L-fuc                        |                    |
|                                    | 117(C)               | 4        | H                              | α-L-fuc                        |                    |
| <i>Triticum vulgaris</i>           | 36                   | 2        | —                              | (glcNAc) <sub>2</sub> , NeuNAC | +                  |
| <i>Ulex europaeus</i>              |                      |          |                                |                                |                    |
| UEA I                              | 68                   | —        | H                              | α-L-fuc                        |                    |
| UEA II                             | 68                   | —        | —                              | (glcNAc) <sub>2</sub>          |                    |
| <i>Vicia faba</i>                  | 50                   | 4(αβ)    | —                              | man, glc                       | +                  |
| <i>Vicia sativa</i>                | 40                   | 4(αβ)    | —                              | glc, man                       | +                  |
| <i>Vicia villosa</i>               | 139                  | 4        | A <sub>1</sub> +T <sub>n</sub> | galNAc                         |                    |
| A <sub>4</sub>                     | 134                  | 4        | A <sub>1</sub>                 | galNAc                         |                    |
| B <sub>4</sub>                     | 143                  | 4        | T <sub>n</sub>                 | galNAc                         |                    |
| <i>Vigna radiata</i>               | 160                  | 4        | —                              | α-gal                          |                    |
| <i>Viscum album</i>                | 115                  | 4(αβ)    | —                              | β-gal                          |                    |
| <i>Wisteria floribunda</i>         | 68                   | 2        | —                              | galNAc                         |                    |

<sup>a</sup> Concentration-dependent molecular weight

<sup>b</sup> Non-agglutinating and mitogenic

<sup>c</sup> Mitogenic for neuraminidase-treated lymphocytes

## References

1. Rueben, L., et al., Activities of lectins and their immobilized derivatives in detergent solutions. Implications on the use of lectin affinity chromatography for the purification of membrane glycoproteins. *Biochemistry*, **16**, 1787-1794 (1977).
2. Liener, et al., The Lectins: Properties, Functions, and Applications in Biology and Medicine, p. 183 (1986).

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