

Art no: 05-0115  
Lot no: 312702

### CERTIFICATE OF ANALYSIS

|                  |  |
|------------------|--|
| Product name:    | <b>PHA-P, Phaseolus vulgaris agglutinin P</b>      |
| Production date: | 2025-05  |
| Date of release: | 2025-07-10   |
| Stability:       | 2030-05  |
| Source:          | <i>Phaseolus Vulgaris</i> beans (Red Kidney Beans) |
| Form:            | Lyophilized  |
| Storage:         | -18 °C (may be shipped at ambient temp)            |

| Analysis        | Specification   | Result       |
|-----------------|---|--------------|
| Appearance      | White to cream coloured powder or flocculate                            | Pass         |
| Solubility      | 1 mg/ml in PBS  | Pass         |
| Protein content | > 85 % (A280) $\epsilon$ 1mg/ml = 1,14                                  | 97.3 %, Pass |
| Purity          | $\geq$ 90% (SDS-PAGE)   | Pass         |
| Microbiology    | < 100 CFU/g   | Pass/Fail    |
| Activity        | Agglutinates human blood group 0 at a concentration $\leq$ 4 $\mu$ g/mL | Pass         |
| Identity        | One major band compare to reference (SDS-PAGE)                          | Pass         |

Appendixes:  
1. SDS-PAGE  
2. Haemagglutination

The above material has met all quality specifications and has been reviewed by a quality representative.

  
Quality Assurance, Asa Engström

2025-12-22

Art no: 05-0115  
Lot no: 312702

**Appendix 1. SDS-PAGE**

**SDS PAGE analysis PHA-P lot 312702**

Electrophoresis with Pharmacia Phast system (Amersham Biosciences)

**Material**

Phast gel gradient 8 – 25  
Phast gel SDS buffer strips

**Method**

The proteins were dissolved to 2 mg/mL 1:1 in 0,9% NaCl and loading buffer (10,9 mM TRIS/HCL, 1,1 mM EDTA, 2,7 % SDS, 50 mM DTT).

LMW marker was from, LMW SDS calibration kit for SDS electrophoresis (GE Healthcare).

MW of proteins included in LMW (14 000 Da - 97 000 Da) marker:

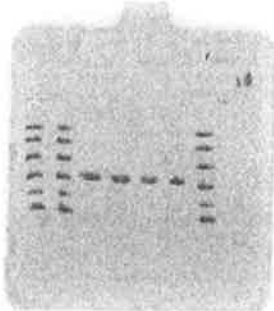
|                    |        |
|--------------------|--------|
| Phosphorylase b    | 97 000 |
| Albumin            | 66 000 |
| Ovalbumin          | 45 000 |
| Carbonic anhydrase | 30 000 |
| Trypsin inhibitor  | 20 100 |
| α-Lactalbumin      | 14 400 |

The samples were boiled for 5 min. and approx. 1.0 µl was applied on Phast gel (gradient 8 – 25).  
Program; 300v, 10.0 mA, 7.0 W, 172 Vh.

The gels were stained with Coomassie blue for 30 min and then destained.

**Result**

1 2 3 4 5 6 7 8



|           |             |                 |
|-----------|-------------|-----------------|
| Lane 1, 2 | Lot: 312609 | LMW standard    |
| Lane 3,4  | Lot: 312702 | PHA-P sample    |
| Lane 5,6  | Lot: 251103 | PHA-P reference |
| Lane 7    | Lot: 312609 | LMW standard    |
| Lane 8    | empty       |                 |

Analysis performed by

*Cynthia Hassinen*  
Cynthia Hassinen / 2025-07-09

Art no: 05-0115  
Lot no: 312702

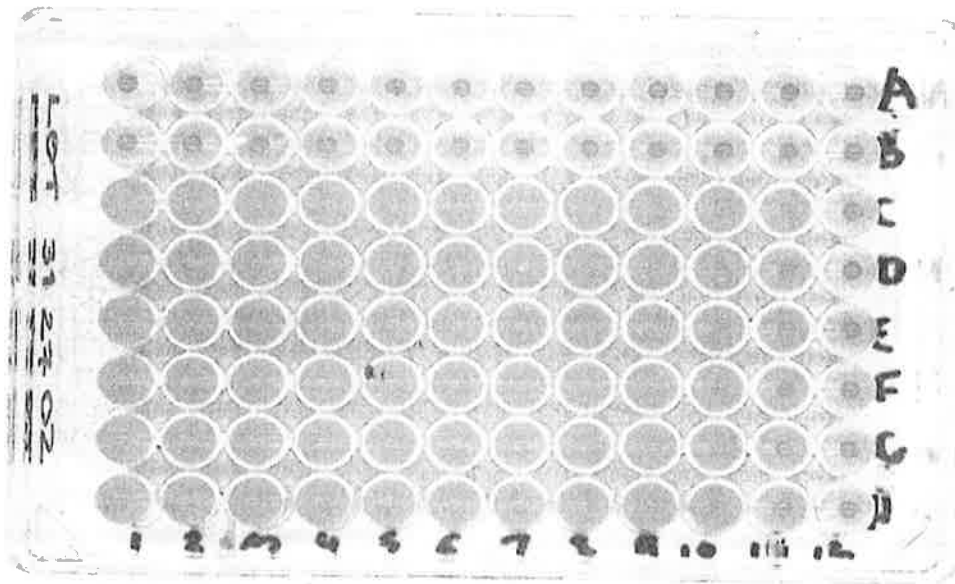
**Appendix 2. Haemagglutination**

**Haemagglutination (human blood group 0)**

Lectin from *Phaseolus vulgaris* (red kidney bean),

Phytohemagglutinin (PHA)-P art nr. 05-0115 lot 312702

| Column 1 | 2   | 3   | 4   | 5  | 6  | 7  | 8   | 9   | 10  | 11  | 12   |           |
|----------|-----|-----|-----|----|----|----|-----|-----|-----|-----|------|-----------|
| Titer    | 0   | 2   | 4   | 8  | 16 | 32 | 64  | 128 | 256 | 512 | 1024 | 2048      |
| Conc     | 500 | 250 | 125 | 63 | 31 | 16 | 7.8 | 3.9 | 2.0 | 1.0 | 0.5  | 0.2 µg/mL |



Row A,B      Blank  
Row C-H     PHA-P lot 312702

Date/Sign: Cynthia Hassinen  
Cynthia Hassinen / 2025-07-09