**B. Pertussis filamentous hemagglutinin (FHA) ELISA # 960-FHA-AG1**

ADI’s B. Pertussis filamentous hemagglutinin (FHA) ELISA kit is a quantitative sandwich ELISA to detect and measure FHA protein in vaccine preparations during manufacturing or in finished vaccines. *This kit is for research use only (RUO)*.

### B. Pertussis FHA (Antigen) ELISA Kit Features
- Highly specific FHA IgG pre-coated, stabilized, ready-to-use 96-well (8 well strips allow the use of 1 or more strips).
- Convenient FHA antigen standards (15-1000 ng/ml) supplied in a stabilizing buffer.
- 100 ul samples (diluted as per the sample concentrations)
- 3 incubations (60+30+15 min) at room temp (25-28°C)
- Sensitivity 5 ng/ml. Storage (2-4°C) & Stability ~6-12 months
- Contains all necessary reagents. For in vitro research use only.

### Assay Procedure: Allow all reagents to reach room temperature. Prepare 1X solution from stock.

**Step 1.** Pipet 100 ul each of the supplied prediluted standards and 100 ul of diluted samples. Mix gently by manually shaking for 5-10 seconds and incubate at room temp (RT) for 60 min.

**Step 2.** Aspirate and wash 3X with the supplied wash buffer. Add 100 ul of detection antibody. Mix gently, and incubate at RT for 30 min.

**Step 4.** Aspirate and wash 5X with the wash buffer. Add 100 ul of Enzyme substrate. Mix gently, and incubate at room temp for 15 min. Blue color develops in positive calibrators and positive samples.

**Step 4.** Pipet 100 ul of stop solution into each well and mix gently (blue color turns yellow). Compare results visually or measure absorbance at 450 nm. Results are obtained by calculating from the standard curve.

### General Information

**Pertussis**, also known as the whooping cough, is a highly contagious disease caused by the bacterium *Bordetella pertussis*. It derived its name from the “whoop” sound made from the inspiration of air after a cough. Despite generally high coverage with the DTP and DTap vaccines, pertussis is one of the leading causes of vaccine-preventable deaths worldwide. Pertussis vaccine was first developed in 1920 using whole bacterium. In 1942, the whole-cell pertussis vaccine was combined with diphtheria and tetanus toxoids to generate the first DTP combination vaccine. Whole cell vaccines have some side effects. Acellular pertussis vaccines contain between one and five B. pertussis antigens: **pertussis toxin (Ptx)**, filamentous hemagglutinin (FHA), **pertactin (Prn)**, and **fimbriae (Fim2 and Fim3)**. Many aspects of the pathogenesis of pertussis and vaccine correlates of protection are poorly understood. However, antibodies to all components of pertussis antigens (PTX, Prn, FHA and Fim) appear to have a direct correlation with protection. The vaccines with three or more components consisting of filamentous hemagglutinin (FHA), pertussis toxin (PT) and pertactin (PRN) are considered to be more effective than one/two-component pertussis vaccines that contain only PT or both PT and FHA.

**Pertactin** (PRN or p69 protein) is a highly immunogenic virulence factor of B. Pertussis. Specifically, it is an outer membrane protein that promotes adhesion to tracheal epithelial cells. Pertussis toxin (PTX) has numerous biological activities and probably plays a role in hampering the host immune response. PT is a protein-based A/B-type exotoxin” because they are formed from two subunits. The “A” subunit possesses enzyme activity, and is transferred to the host cell following a conformational change in the membrane-bound transport “B” subunit. FHA is one of two hemeagglutinins produced by phase I strains of B. pertussis. On a weight basis, FHA is five to seven times more active in hemeagglutination (HA) assays than is pertussis toxin. FHA is a protein with an approximate molecular weight of 200 Kda. Fimbriae have been considered important vaccine components for many years in both whole-cell and acellular vaccines. B. pertussis expresses two serologically distinct fimbriae composed of either Fim2 (207-aa; 22.5 kda) or Fim3 (204-aa, 22 kda) major subunits. Antibody responses to Fim1-3 have been observed in human samples.

**Pertussis Vaccines**: Trihibit (DTAP/Hib), ActHib (Hib-PRP-T), Daptacel (DTAP), Tripedia (DTAP), Adacel (tetanus, Diphtheria, Acellular Pertussis) - Sanofi Pasteur; PedvaxHib (Hib-PRP-OMP) – Merck; Pediarix (DTAP/HepB/IPV), Infanrix (DTAP), Boostrix (Tetanus, Diphtheria, Acellular Pertussis) - GlaxoSmithKline.

### Pertussis Vaccine Antigen ELISA kits

<table>
<thead>
<tr>
<th>Items</th>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>B. pertussis Vaccine (Pertussis Toxin, PT/PTOX) Antigen ELISA</td>
<td>PT Antigen</td>
<td>#960-PTX-AG1; B. Pertussis Toxoid/Toxin (PTX) vaccine ELISA for the measurement PTX in biological buffer, 96 tests</td>
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<tr>
<td>B. pertussis Vaccine (FHA) Antigen ELISA</td>
<td>FHA Antigen</td>
<td>#960-FHA-AG1; B. Pertussis Filamentous hemeagglutinin (FHA) ELISA for the measurement PTX in biological buffer, 96 tests</td>
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<tr>
<td>B. pertussis Pertactin (PRN) Antigen ELISA</td>
<td>PRN Antigen</td>
<td>#960-PRN-AG1; B. Pertussis Pertactin (PRN) ELISA for the measurement PTX in biological buffer, 96 tests</td>
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