ImmunoPlatelet MAIPA ID Kit Detection for Anti-Platelet Antibody Identification

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Objective:

The ImmunoPlatelet MAIPA ID Kit Detection is a precise qualitative in vitro diagnostic device, specifically developed for professional laboratory applications. This diagnostic tool is designed to identify and detect anti-platelet antibodies in serum and plasma samples, along with identifying autoantibodies attached to patient platelets. It plays a crucial role in diagnosing patients with various immune thrombocytopenia disorders, including Fetal-Neonatal Allo-Immune Thrombocytopenia (FNAIT), Post-Transfusion Purpura (PTP), and Platelet Refractoriness (PR).

The ImmunoPlatelet MAIPA ID Kit Detection is essential for assessing platelet antibodies, ensuring safe platelet transfusions, and offering valuable insights for effective patient management in cases of platelet-related immunological conditions.

This tool is intended for manual operation in clinical laboratories, delivering fast, trustworthy, and accurate results. The ImmunoPlatelet MAIPA ID Kit Detection is an indispensable asset for healthcare providers working to diagnose and treat platelet disorders and guarantee the best patient care outcomes.

Overview:

The ImmunoPlatelet MAIPA ID Kit Detection utilizes the MAIPA (Monoclonal Antibody-specific Immobilization of Platelet Antigen) method, a precise and highly sensitive technique for detecting anti-platelet antibodies. Originally developed by Kiefel et al. in 1987 (Blood 70: 1722-1726), this technique enables the identification of both alloantibodies and autoantibodies, providing essential insights into platelet-related immune disorders.

Diagnostic Approaches:

The ImmunoPlatelet MAIPA ID Kit Detection provides two key diagnostic approaches to enhance platelet antibody identification:

1. Indirect MAIPA (MAIPAI):
   This approach involves screening serum or plasma samples to detect anti-platelet antibodies. It allows the identification of both alloantibodies and autoantibodies in the patient's sample.
2. Direct MAIPA (MAIPAD):
   This method tests for antibodies bound to the patient's platelets, giving a comprehensive immune response evaluation. It directly identifies platelet-bound antibodies, offering critical data on the patient's immune status.

Diagnostic Precision:

A positive result in the indirect MAIPA screening leads to the identification of antibodies targeting specific Human Platelet Antigen (HPA) antigens. This step aids in delivering precise diagnoses, allowing healthcare professionals to tailor treatment strategies effectively for each patient.

Applications:

The ImmunoPlatelet MAIPA ID Kit Detection is essential for a range of applications:

- Screening for Anti-Platelet Antibodies: Ideal for identifying alloantibodies and autoantibodies in serum or plasma samples of patients suspected of having immune thrombocytopenia or other platelet-related disorders.
- Diagnosis of Platelet Refractoriness (PR): Used in cross-match testing for donor platelet antigens and recipient serum to ensure compatibility and prevent adverse reactions during transfusion.
- Fetal-Neonatal Allo-Immune Thrombocytopenia (FNAIT): Crucial for testing maternal serum for antibodies against fetal platelet antigens, preventing complications during pregnancy and childbirth.
- Post-Transfusion Purpura (PTP): Helps detect platelet antibodies following platelet transfusions, ensuring safe and effective transfusion outcomes.

Why Choose ImmunoPlatelet MAIPA ID Kit Detection?

- High Sensitivity and Specificity: The ImmunoPlatelet MAIPA ID Kit Detection offers highly precise detection of anti-platelet antibodies, ensuring accurate diagnosis of platelet refractoriness, FNAIT, PTP, and other platelet disorders.
- Comprehensive Antibody Identification: The kit helps identify the specificity of anti-platelet antibodies, ensuring more tailored treatments and accurate platelet transfusion compatibility.
- Clinically Proven Technology: Based on the trusted MAIPA technique, this kit provides reliable, reproducible results in clinical diagnostics.
- Professional Laboratory Use: Designed for use in hospitals, research labs, and diagnostic centers, the ImmunoPlatelet MAIPA ID Kit Detection provides a comprehensive solution for platelet-related immune disorders.

Principle:

The ImmunoPlatelet MAIPA ID Kit Detection operates based on a two-step process utilizing the Monoclonal Antibody-specific Immobilization of Platelet Antigen (MAIPA) technique. This highly sensitive method captures platelet antigens using mouse monoclonal antibodies that specifically react with human platelet membrane glycoproteins. The captured human antibodies are then

analyzed through an ELISA (Enzyme-Linked Immunosorbent Assay) immuno-assay for anti-platelet antibody identification.

▢ Step 1: Screening (Indirect MAIPA and Direct MAIPA)

The first step involves screening for anti-platelet antibodies by testing a serum sample with platelets from a pooled group of 6 to 12 erythrocyte group O donors. These donors are selected based on specific platelet genotypes. The serum is incubated with monoclonal antibodies that specifically bind to four key platelet glycoproteins:

- GPIIbIIIa
- GPIaIIa
- GPIbIX
- β2-microglobulin/HLA

- Indirect MAIPA (MAIPAI): In this step, the patient's serum is tested for the presence of anti-platelet antibodies by incubating with the pooled platelets and monoclonal antibodies targeting the glycoproteins. The test identifies antibodies present in the serum that react with platelet antigens.

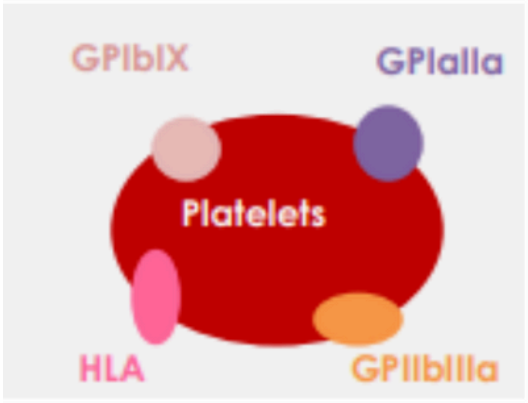
- Direct MAIPA (MAIPAD): For patients with already-bound IgG antibodies on their platelets, direct testing involves incubating the patient's platelets with the same set of monoclonal antibodies. This step detects antibodies already bound to the platelets.

▢ Step 2: Detection of Anti-Platelet Antibodies

After the incubation, platelets are lysed, and the lysates are cleared by centrifugation. The samples are then transferred to a microplate pre-coated with goat anti-mouse IgG antibodies. The monoclonal antibody-platelet complex binds to the surface of the plate, and the binding is detected using goat peroxidase-coupled anti-human IgG. The reaction is then revealed with the peroxidase substrate TMB (3,3',5,5'-Tetramethylbenzidine). A blue color forms, indicating the presence of an anti-glycoprotein antibody. The color reaction is halted by adding H_2SO_4, which turns the blue color to yellow, measurable at 450 nm.

▢ Step 3: Antibody Identification

The second step involves identifying the specific antibody detected during screening. This is done using genotyped platelets. In this stage, the serum that showed a positive reaction in the screening step is tested with known genotype platelets. This step helps to identify the specific platelet glycoprotein antigen (HPA) that the antibody targets. Typically, this identification process is performed after indirect MAIPA (MAIPAI) testing, whereas direct MAIPA (MAIPAD) testing may not require this additional step unless further examination is needed.



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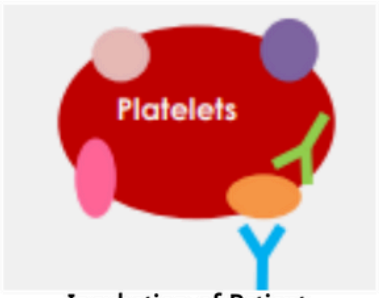


Incubation of Patient Plasma/Serum with Mouse Monoclonal Antibodies.

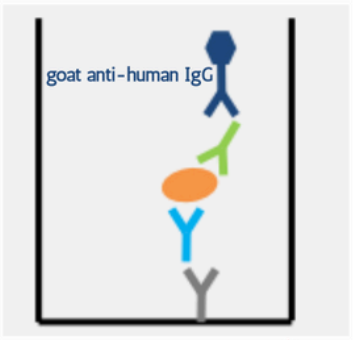
2

Cell Lysis and Centrifugation to Eliminate Platelet Debris.

3

Binding of Ag/Ab Complex to Goat Anti-Mouse IgG Coated Microplate.

4



Detection of Human Anti-Platelet Antibody Using Goat Anti-Human IgG Conjugated with Peroxidase

MAIPA Worksheet : 5 Patients Direct & Indirect Screening

Step	**PLTL Patient 1**	**PLTL Patient 2**	**PLTL Patient 3**	**PLTL Patient 4**	**PLTL Patient 5**
A. Blank	no serum	no serum	no serum	no serum	no serum
B. Blank	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
C. Screening	SCREEN PLTL	PLTL Patient 1	PLTL Patient 2	PLTL Patient 3	PLTL Patient 4
D. Control	CONTR 1a	no serum	no serum	no serum	MAB HLA
E. Screening	SCREEN PLTL	PLTL Patient 1	PLTL Patient 2	PLTL Patient 3	PLTL Patient 4
F. Control	CONTR 5b	no serum	no serum	MAB HLA	MAB IbIX
G. Screening	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL
H. Control	CONTR NEG	Serum Patient 1	Serum Patient 2	Serum Patient 3	Serum Patient 4
MAB IbIX	MAB IbIX	MAB IbIX	MAB IbIX	MAB IbIX	MAB IbIX

MAIPA Worksheet: 7 Patients Identification

Step	ID PLTL 1	ID PLTL 2	ID PLTL 3	ID PLTL 4	ID PLTL 5	ID PLTL 6	ID PLTL 7
A. Blank	Serum Patient 1	Serum Patient2	Serum Patient3	Serum Patient4	Serum Patient 5	Serum Patient 6	Serum Patient 7
MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
B. Blank	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
C. Screening	SCREEN PLTL	ID PLTL 1	ID PLTL 2	ID PLTL 3	ID PLTL 4	ID PLTL 5	ID PLTL 6
Control	CONTR 1a	Serum Patient 1	Serum Patient 2	Serum Patient 3	Serum Patient 4	Serum Patient 5	Serum Patient 6
MAB HLA	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
D. Control	CONTR 5b	Serum Patient 1	Serum Patient 2	Serum Patient 3	Serum Patient 4	Serum Patient 5	Serum Patient 6
MAB IbIX	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
E. Screening	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL	SCREEN PLTL
F. Control	CONTR NEG	Serum Patient 1	Serum Patient 2	Serum Patient 3	Serum Patient 4	Serum Patient 5	Serum Patient 6
MAB IbIX	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa
G. Identification	ID PLTL 1	ID PLTL 2	ID PLTL 3	ID PLTL 4	ID PLTL 5	ID PLTL 6	ID PLTL 7
H. Control	Serum Patient 1	Serum Patient 2	Serum Patient 3	Serum Patient 4	Serum Patient 5	Serum Patient 6	Serum Patient 7
MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa	MAB IIbIIIa