

CONFIRMATION OF BOMBAY AND PARA-BOMBAY BLOOD GROUP

Confirmation of the Bombay and Para-Bombay blood groups relies on a stepwise process to distinguish them from the common Type O blood group, which they frequently mimic in routine tests.

Initial Screening (ABO Discrepancy)

The first sign of these rare groups is often a discrepancy between forward and reverse blood grouping:

Forward Grouping:

Shows as **Group O** (no reaction with Anti-A or Anti-B reagents) because A and B antigens are absent on the red blood cells (RBCs).

Reverse Grouping:

Serum reacts strongly with A cells, B cells and O cells. In normal Group O, there is no reaction with O cells because they possess the H antigen; Bombay individuals have anti-H antibodies that attack O cells.

Confirmatory Serological Tests

To confirm the specific phenotype, specialized laboratory tests are performed:

Anti-H Lectin Test: The patient's RBCs are tested with *Ulex europaeus* (Anti-H lectin).

- **Bombay:** No agglutination (complete absence of H antigen).
- **Para-Bombay:** No agglutination or very weak/delayed reaction.

Saliva Secretor Test (Hemagglutination Inhibition)

This is the primary way to differentiate between the two:

- **Bombay:** A "non-secretor" no H, A, or B substances are found in the saliva.
- **Para-Bombay:** A "secretor" H and A/B substances are present in the saliva even if they are missing or weak on RBCs.
- **Adsorption-Elution Test:** Used specifically for Para-Bombay to detect trace amounts of A or B antigens on RBCs that standard tests might miss.

Molecular Confirmation

If serological results are inconclusive, genetic testing of the *FUT1* (H gene) and *FUT2* (Se gene) provides definitive proof:

- **Bombay:** Typically shows homozygous mutations or deletions in both *FUT1* (hh) and *FUT2* (sese).
- **Para-Bombay:** Shows a mutated *FUT1* gene but at least one functional *FUT2* gene (Se), allowing for the secretion of antigens.

| Feature | Type O | Bombay (Oh) | Para - Bombay |
|-------------------|--------------------------|-----------------|------------------------|
| Forward Grouping | 'O' | 'O' | 'O' (or weak A/B) |
| Reverse (O cells) | No reaction | Strong reaction | Reaction (may be weak) |
| Anti - H Lactin | Strong Positive reaction | Negative | Negative / Weak |
| Saliva Secretor | Positive (usually) | Negative | Positive |