



## How Are Antibodies Used for Blood Typing?

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem\\_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing](https://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing)

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### Experimental Procedure

1. In your lab notebook make a data table, like Table 3, to record all your data and observations.

| Trial Number | Sample Number | Reaction with Anti-A (Y/N) | Reaction with Anti-B (Y/N) | Reaction with Anti-Rh (Y/N) | Determined Blood Type<br>(from Table 1, in the <b>Background</b> ( <a href="http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#background">http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#background</a> ) <b>tab</b> ) |
|--------------|---------------|----------------------------|----------------------------|-----------------------------|---|
| 1            | 1             |                            |                            |                             |   |
|              | 2             |                            |                            |                             |   |
|              | 3             |                            |                            |                             |   |
|              | 4             |                            |                            |                             |   |
| 2            | 1             |                            |                            |                             |   |
|              | 2             |                            |                            |                             |   |
|              | 3             |                            |                            |                             |   |
|              | 4             |                            |                            |                             |   |
| 3            | 1             |                            |                            |                             |   |
|              | 2             |                            |                            |                             |   |
|              | 3             |                            |                            |                             |   |
|              | 4             |                            |                            |                             |   |

**Table 3.** You will need a data table like this to record your data.

2. Using a disposable plastic pipette, place a drop of synthetic blood sample #1 in each well of a blood typing slide.

3. Add a drop of synthetic anti-A to the well labeled A.
4. Add a drop of synthetic anti-B serum to the well labeled B.
5. Add a drop of synthetic anti-Rh serum to the well labeled Rh.
6. Using a different color mixing stick for each well, gently stir the synthetic blood and antiserum drops for 30 seconds. Remember to discard each mixing stick after a single use to avoid contamination to your samples.
7. After 30 seconds of stirring *carefully* examine the liquid in the wells.
  - a. If the liquid is clear or light pink with no particles or cloudiness formed, then no reaction has occurred and you should mark "No" in the appropriate box in the data table.
  - b. If there are solid particles that have formed in mixing the sample or antiserum (they may be darker or lighter than the original liquid), then a reaction has occurred and you should mark "Yes" in the appropriate box. Also, if the liquid has very small particles formed, giving a cloudy appearance to the liquid, then a reaction has occurred and you should mark "Yes" in the appropriate box.
  - c. It is important to look very closely at the wells and only do one well at a time. Be sure to stir at least 30 seconds with the plastic stick. The final product may be clear, white or dark pink depending on the combination of blood sample and antiserum, so look carefully to see if small or large particles have formed in the well.
  - d. Reference the photos in Figure 1 for help determining if a reaction has occurred or not. If you continue to have trouble read the [FAQ \(#help\)](#) for this project.



**Figure 1.** If the antiserum does *not* cause agglutination the sample will be free of floating particles like the picture on the left. If the antiserum *does* cause a reaction the sample will turn cloudy and you will see particles form as shown in the picture on the right.

8. Record the results for the first blood sample in the data table.

9. Thoroughly rinse the blood typing slide, then repeat steps 2 through 8 for synthetic blood samples 2, 3, and 4. Use a different pipette for each synthetic blood sample to prevent cross contamination.
10. Repeat steps 2 through 9 two more times so that you have done a total of three trials.
11. Once you have determined the blood type for each sample (by referring to Table 1, in the **Background** ([http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem\\_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#background](http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#background))), you are ready to look at the data like a doctor. Would any of the samples make good donor-recipient pairs for a blood transfusion? Why or why not?

## Frequently Asked Questions (FAQ)

FAQ for this Project Idea available online at [https://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem\\_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#help](https://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#help) ([http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem\\_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#help](http://www.sciencebuddies.org/science-fair-projects/project-ideas/BioChem_p008/medical-biotechnology/how-are-antibodies-used-for-blood-typing#help)).