

Fish-scale waste to portable bioactive discs: A sustainable platform for sensitive and reliable blood group analysis

Tharun K. Bollu^a, Divya S. Parimi^a, Chandra S. Bhatt^{a, b} and Anil K. Suresh^{a,*}

^a*Bionanotechnology and Sustainable Laboratory, Department of Biological sciences, School of Engineering and Applied Sciences, SRM University-AP, Amaravati-522503, India.*

^b*Department of Biotechnology, FS&H, SRMIST, Kattankulathur, Chennai-603203, India.*

*Corresponding author: Tel. + 919440968970

E-mail address: anil.s@srmap.edu.in

Detailed protocol for the comparison of blood group analysis performed on our novel Bio-Disc versus Gold Standard Conventional Tube Method ($n=3$).

To compare the workability and efficiency of blood typing, the results of blood typing assay using our novel bio-discs were compared to that of a gold standard conventional tube technique (CTT). Briefly, 1 mL of uncoagulated whole blood was centrifuged at 1000g for 10 minutes to separate the blood components. The plasma was carefully isolated and the RBCs were suspended in 0.9% saline solution (5 mL). RBC suspension was then centrifuged and further re-suspended in saline solution, this step was repeated three times. The final concentration of RBC suspension was adjusted to 5% using saline. In 3 test tubes containing 50 μ L of the RBC suspension, 100 μ L of respective antisera suspensions (Antisera-A, Antisera-B and Antisera-D) were added, and the tubes were incubated for 15 minutes and centrifuged for 20 seconds at 1000g. The tubes were ranked according to the agglutination level i.e. 0 to +4 following standard grading. Whereas, the same blood samples were tested using our novel bio-discs as per the procedure described in the main article.

Detailed protocol for the stability performance of blood typing of the antisera sorbed bio-discs (n=3).

Antisera sorbed bio-discs were refrigerated at 2-8 °C. Hemagglutination assay was performed at predetermined intervals with A, B, AB and O blood types of either Rh groups in triplicates. The assay results were assessed for accuracy of hemagglutination by various independent lab technicians. The bioactive discs were stable up to six months when stored at 2-8° C as reported by conspicuous hemagglutination reactions. The images of the same were shown in main article.

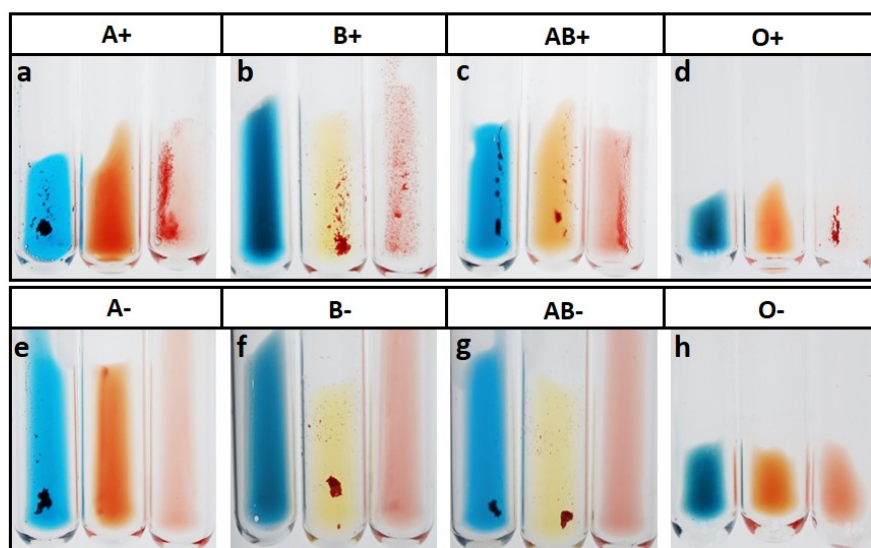


Fig. S1. Performance of blood grouping analysis by conventional gold standard test-tube method for all the ABO blood types of either Rh factors. As per the visible degree of aggregation the test samples were interpreted and the results were confirmed as (a) A positive, (b) B positive, (c) AB positive, (d) O positive, (e) A negative, (f) B negative, (g) AB negative and (h) O negative.