

# Comparison of Two Low-Ionic Strength Diluents for Dilution and Storage of Reagent Red Blood Cells for Use in Gel Test Systems

Jimmy Lowery, Noel Brown, Marian Schaefer  
Hemo bioscience, Inc., Durham, NC

## Background

Before use in certain gel testing methods such as the ID-MTS™ gel system, red blood cells (RBCs) should be prepared in a hypotonic, low-ionic strength solution containing EDTA. The intent of this study is to compare the reactivity of RBCs prepared and stored in MTS Diluent 2 Plus™ with those prepared and stored in Hemo bioscience GelCell Diluent when used in a gel antibody screening and identification system.



Figure 1: HBS GelCell Diluent

## Method

A total of 31 antibody positive samples were tested, which included weak and diluted polyclonal and monoclonal IgG antibodies. Most common clinically significant antibodies were represented (Rh, Kidd, Kell, Duffy, S, s) in addition to known antibody negative plasma samples. These antibody samples were tested with 0.8% suspensions prepared from Medion Search-Cyte Plus® and/or Data-Cyte Plus® commercially prepared 3% reagent RBCs. Cells were selected which demonstrated a heterozygous expression, thus a weaker expression of the red cell antigen being evaluated.

Also tested were 12 antibody negative plasma samples representing various ABO groups. Reverse group testing was performed on these samples using 0.8% suspensions prepared from Medion Reverse-Cyte® commercially prepared 3% A1 and B reverse group cells.

Suspensions of all reagent RBCs were prepared and stored at 0.8% concentration in MTS Diluent 2 Plus™ (MTS2+) and HBS-GelCell Diluent (GCD)(Figure 1). The RBCs were tested at Day 0, Day 7, Day 14 and Day 28. Diluted RBCs and samples were stored at 2-8°C between testing events and were allowed to equilibrate to room temperature prior to testing.

For antibody testing, Anti-Human Globulin Anti-IgG (Rabbit) MTS Anti-IgG Cards™ and the ID-MTS™ manual gel system were used while MTS Buffered Gel Cards were used for reverse group testing. Testing was performed according to the manufacturer's recommendations, except when GCD was substituted for MTS2+.

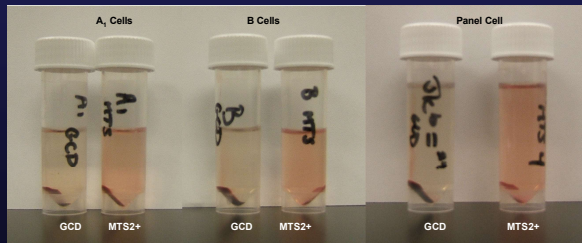


Figure 2: Cells at 28 Days Storage

## Results

Cells prepared in MTS2+ or GCD on the day of testing performed comparably with all antibodies tested. Over 28 days of testing, RBCs stored in GCD showed an increased sensitivity of E, e, and Kell antigens when compared to the same cells stored in MTS2+. (Figure 3) After 28 days storage, no significant hemolysis was noted in RBCs suspended in GCD while slight hemolysis was seen in cells stored in MTS2+. (Figure 2)

Reverse group cells stored in GCD and MTS2+ performed as expected over 28 days of testing with no variation in strength of reaction. (Table 1)

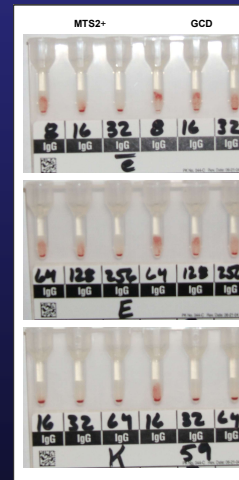


Figure 3: Day 28 Antibody Testing Results

ABO	MTS 2+		GCD	
	A1 Cells	B Cells	A1 Cells	B Cells
AB #1	0	0	0	0
AB #2	0	0	0	0
AB #3	0	0	0	0
A#1	0	4+	0	4+
A#2	0	4+	0	4+
A#3	0	4+	0	4+
B #1	4+	0	4+	0
B #2	4+	0	4+	0
B #3	4+	0	4+	0
O #1	4+	4+	4+	4+
O #2	4+	4+	4+	4+
O #3	4+	4+	4+	4+

Table 1: Day 28 Reverse Cells Testing Results

## Conclusion

HBS-GelCell Diluent performed comparably and is an acceptable alternative to MTS Diluent 2 Plus™ for preparing 0.8% cell suspensions from commercially prepared 3% reagent RBCs when prepared on the day of testing. When extended storage of 0.8% cell suspensions is required, RBCs stored HBS-GelCell Diluent offers an advantage of increased sensitivity of certain antigens when compared to cells stored in MTS Diluent 2 Plus™.

## References

- Hemo bioscience, Inc. HBS-GelCell Diluent Package Insert
- MTS Buffered Gel Card Package Insert
- MTS AHG Anti-IgG (Rabbit) MTS Anti-IgG Card Package Insert