**Microscopes**

TSL has two microscopes for use in problem resolution.

* ***JENCO****: dissecting scope, limited magnification*
* ***Olympus BH-2:*** *multiple oculars; tube support or wet mount*

**When to use microscope?**

* Confirm rouleaux prior to saline replacement technique when resolving ABO reverse typing problems.
* Examination of weak reactions in tube testing.
* Confirm mixed field in tube testing.
* Detecting specific patterns of agglutination. Example is anti-Sda which produces small refractile agglutinates in a sea of free red cells, giving the appearance of mixed field.

**Limitations**

* Not a replacement for accurate tube reading technique
* Can create more trouble if tubes are “over read”.
* Is not reliable for detecting a FMH in maternal anti-D tube at AHG in determining RhIg dosage
* Manufacturer package insert will specify if microscopic examination is recommended. Typically, it is not a routine indication by the manufacturer.

**Practice**

* Put a drop of any reagent red cell suspension into a tube and take it to the Olympus.
* With the tube holder in a stationary position, adjust the focus until the cell suspension is in focus for you.
* Move the tube back and forth observing multiple fields.
* Mix a drop of A1 and B cells with 1 drop anti-A or anti-B.
* Centrifuge and read with agglutination viewer.
* Take it to the Olympus.
* With the tube holder in a stationary position, adjust the focus until the cell suspension is in focus for you.
* Move the tube back and forth observing multiple fields.
* Confirm 50% mixed field findings
* Perform a DAT with Polyspecific or anti-IgG on the sample in the blue rack.
* Confirm agglutination viewer findings with the Olympus.
* This is a patient who has had a POS DAT – Mixed Field – following multiple transfusions of antigen pos units. The Eluate contained anti-K.
* Mix 1 drop CC cells with 9 drops patient cells. Perform a DAT. Use microscope to confirm weak mixed field. It is almost impossible to differentiate a W+ reaction from MF without the scope.

**Additional Microscope Info:**

***February 22, 2012 by Scott Warner***

**Why do we read a DAT under the microscope?**

To look for mixed field agglutination.

But when should we look for mixed field agglutination?

* A DAT can detect red cells coated with antibodies of complement, an insensitive and nonspecific test.
* AABB Technical Manual states that a microscopic can be useful in distinguishing rouleaux from true agglutination and may also allow for the detection of specific patterns of agglutination that are characteristic of some antibodies.
* A mixed field appearance in the posttransfusion DAT (i.e. agglutination of donor red cells and no agglutination of the patient’s red cells) may or may not be observed.

Thus, Scott assumes that we should read a DAT microscopically when evaluating equivocal reactions and confirming negative posttransfusion specimens, a potentially confusing choice between working smarter (conserving resources and avoiding over-reading) and simpler (one procedure for all specimens). Both have value.

**Microscopically Speaking by Blood Bank Guy**

*Written by Monica LaSarre, June 2012*

**Q:** In tube testing, why don’t you read your reactions under the microscope, except for the DAT? It seems like you would want to see any incompatibility, and the microscope can show stuff that you would miss with the naked eye.

**A:** The question of when it’s appropriate to read agglutination reactions microscopically is entirely dependent on the reagents being used. The manufacturer’s package insert will specifically instruct the technologist whether to read macroscopically (with the naked eye only), or both macroscopically and microscopically. Their instructions are based on their validation of the reagent and definition of appropriate testing instructions so as to minimize detection of false positive reactions.

Despite the temptation to be as thorough as possible (which really defines you as a blood banker!), it’s important to resist the urge and NOT read microscopically if the package insert doesn’t instruct you to do so. Forging ahead and sticking that tube under the scope could result in you seeing “grainy” agglutination that is not intended to be interpreted as positive, which would cloud the picture of the patient’s serologic results. Unnecessary work would result, and this could even lead to adverse patient consequences: for example, if you were busy chasing down a “phantom” antibody and blood wasn’t available for this or another patient in need.