



## **Increased Utilization of Flow Cytometry in HLA Crossmatching Reported in CAP Proficiency Testing**

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Flow cytometry, one of the more recent technologies used for transplantation crossmatching, has proved to be a more sensitive crossmatching method than earlier cytotoxicity-based methods – both standard complement-dependent- and anti-human globulin (AHG)-augmented cytotoxicity methods.<sup>1</sup>

Research shows that a positive flow cytometric crossmatch in the presence of either a negative cytotoxic crossmatch or a negative AHG-augmented crossmatch is a strong predictor of graft rejection.<sup>2,3</sup>

Guidelines from the United Network for Organ Sharing state that cytotoxicity tests can be used for initial crossmatching, but more sensitive tests should be performed to identify patients with antibodies.<sup>4</sup> Furthermore, the cytotoxicity method chosen should be more sensitive than the basic NIH complement-dependent microlymphocytotoxicity test. Flow cytometry is an especially important test for patients with HLA antibodies when there is a negative crossmatch using a less sensitive method.

For these reasons, the College of American Pathologists performed a study to determine if the use of flow cytometry as a transplantation crossmatching method has increased in HLA laboratories from 2002 to 2007. Proficiency test results were evaluated to determine which methods laboratories were using. Results indicate that indeed, flow cytometry was being used in a higher proportion of total crossmatching tests. There was a 7.1 percent increase in proportion for the flow cytometry method in the survey evaluating proficiency in antibody identification, antibody reactivity, and crossmatching for HLA Class I antibodies, and a 20.6 percent increase in the survey for HLA Class II antibodies.

Both the MX1 and MX2 surveys showed a significant percentage of participants still using cytotoxicity methods for crossmatching, even in 2007. One might expect to see a larger shift toward flow cytometry, given the clinical data showing its high sensitivity.

A larger shift toward exclusive use flow cytometry was not seen in this study, though, because the College of American Pathology proficiency tests allow

laboratories to report crossmatching results obtained by using multiple methods. In day-to-day practice, laboratories often perform initial crossmatching using cytotoxicity methods and follow with more sensitive methods including flow cytometry, particularly when the presence of HLA antibodies is suspected. In accordance with United Network for Organ Sharing guidelines, using more than one method is prudent and also explains why the proportionate increase for flow cytometry versus other methods is not higher.

## References

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