

Lessons Learned from the Results of Proficiency Testing for the Leptospirosis Microscopic Agglutination Test

Roderick J. Chappel^{1*}, Marga Goris², Martin F. Palmer³ and Rudy A.
Hartskeerl²

¹National Serology Reference Laboratory, Australia

²Royal Tropical Institute, Amsterdam, The Netherlands

³County Hospital, Hereford, UK

The microscopic agglutination test (MAT) for detecting antibodies against leptospiral bacteria remains in wide use throughout the world. The ability of a laboratory to deliver accurate and meaningful test results depends on the application of quality assurance measures within the context of a quality management system. The MAT has a particular need for quality assurance, because it uses, as a test reagent, cultures of live leptospiral bacteria, which are difficult to standardize. There are also differences between laboratories in how the test is performed, and a subjective element in reading the test.

Proficiency testing is an essential element of laboratory quality assurance. However, it may sometimes not be readily available, or may be prohibitively expensive for some laboratories. For this reason, the International Leptospirosis Society (ILS) offers a low cost proficiency testing scheme for the MAT. Seven rounds have been distributed, and there are currently 92 participants in 48 countries.

The use and interpretation of the MAT are greatly complicated by the antigenic complexity of leptospiral bacteria. The genus *Leptospira* includes more than 200 serovars within more than 25 serogroups. The MAT is broadly serogroup-specific, so that cross-reactions between serovars are usually observed within but not between serogroups. However, proficiency testing, which generates many individual results, shows that serogroups – which have no taxonomic status - are arbitrary. Unexpected cross-reactions may occur, and may differ depending on the reference laboratory from which a test culture was sourced.

The antigenic complexity of leptospirae, combined with the inherent difficulties in standardizing the MAT, makes participation in proficiency testing imperative. Proficiency testing is designed to help individual laboratories to improve performance. However, it also helps us to understand the complexity of cross-reactions, and factors that may influence MAT results.