DETERMINATION OF ENDOTOXIN – PITFALLS OF MEASUREMENT WITH DIFFERENT METHODS

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Bacterial lipopolysaccharides (endotoxins) of Gram-negative bacteria are dominant components of organic dust at several work places. Adverse health effects are possible, especially respiratory disorders induced by occupational airborne exposure. Limulus Amoebocyte-Lysate (LAL) test is so far the most widely used method for endotoxin quantification. In recent years, an assay using recombinant Factor C instead of the hemolymph lysate has been developed (rFC test). The aim of the present study was to establish the rFC test in addition to the LAL test and to document specific features of each method.

A total of 169 samples from different sources was analysed with both tests to determine comparability and correlation of results. Both tests showed recovery as required (50 to 200%) and the coefficient of variation regarding duplicates was mostly below 10%. Results of endotoxin activity measured with both assays are significantly correlated ($p<0.0001$, $r_s= 0.9$) and the matching is also evident in the Bland Altman plot. However, it has to be considered that the values received with the two methods are not identical and the magnitude of the difference depends on the level of endotoxin activity.

In conclusion, rFC-test is a valuable standardized method for endotoxin detection and offers a long-term perspective without the use of animal material. However, users should keep in mind which endotoxin method is used, because results are always given in endotoxin units (EU) but the assays yield different results dependent on their measurement strategy. Therefore, methods should not be changed within one study.