Comparison of Two Commercial Tick-Borne Encephalitis Virus IgG Enzyme-Linked Immunosorbent Assays

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In this publication two commercial ELISAs for the determination of IgG antibodies towards the tick-borne encephalitis virus (TBEV) are compared:

- Progen Immunozym FSME IgG ELISA (termed ELISA-1 in the publication)
- EUROIMMUN Anti-TBE Virus ELISA "Vienna" (IgG; order number EI 2661-9601-9 G) (termed ELISA-2 in the publication)

Sample cohort used to compare both assays: 398 healthy blood donors from Basel, Switzerland (no information regarding vaccination or exposure history available).

Results:

	Progen ELISA positive	Progen ELISA indeterminate	Progen ELISA negative	Total
EUROIMMUN ELISA positive	44	2	0	46
EUROIMMUN ELISA indeterminate	4	0	0	4
EUROIMMUN ELISA negative	15	101	232	348
Total	63	103	232	398

276 of the sera yielded concordant results among which 44 were positive and 232 were negative in both ELISAs. Discordant results were observed for 122 sera: 15 were fully discordant (Progen positive/EUROIMMUN negative) and 107 partially discordant (101 Progen indeterminate/EUROIMMUN negative; 6 with positive or indeterminate reactivity in both ELISAs). The Progen ELISA produced a considerably higher number of indeterminate results compared to the EUROIMMUN ELISA (25.8% vs. 1.0%).

Only 1 of the 15 fully discordant sera that were positive with the Progen ELISA but negative with the EUROIMMUN ELISA was tested positive in a neutralization test (NT) pointing to false positive results of the Progen ELISA. Due to the results of additionally performed IFA analyses (EUROIMMUN Flavivirus mosaic with YFV, WNV, JEV, DENV 1-4) the authors conclude that cross-reactivities with antibodies against yellow fever virus (YFV), West Nile virus (WNV) or dengue virus (DENV) may contribute to the false positive or indeterminate results of the Progen ELISA. As a possible reason a lack of antigen purity in the Progen ELISA is discussed. The authors further state that the EUROIMMUN ELISA is "more specific" than the Progen ELISA and that it exhibits a "reasonable sensitivity and specificity for anti-TBEV IgG population screening of human sera". Agreement of the Progen ELISA with the NT in this study was moderate but substantial for the EUROIMMUN ELISA. The seroprevalences for healthy blood donors that were achieved with the different assays were 15.3% for the Progen ELISA, 11.6% for the EUROIMMUN ELISA, and 8.8% for the NT (at dilution of 1:10).

Conclusions: In this study the EUROIMMUN Anti-TBE Virus ELISA "Vienna" achieved a higher specificity than the Progen Immunozym FSME ELISA. The EUROIMMUN ELISA also turned out to be more capable in distinguishing positive from negative samples as it produced considerably less borderline results than the Progen ELISA. Finally, the EUROIMMUN ELISA correlated better with the neutralization test (NT).