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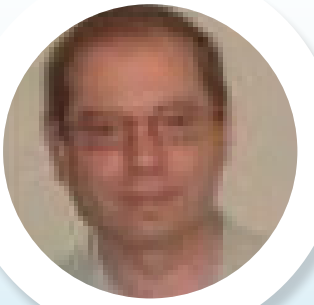
Increasing performance and throughput of ELISA procedures through implementation of ready-to-use plates and optimisation of the binding kinetics of the capture and detection antibodies



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Applications of the enzyme-linked immunosorbent assay (ELISA) are very common in a variety of biological disciplines. In the biopharmaceutical industry ELISAs are utilised for measuring drug substance and residual proteins for quality control and process development. However, they are labour intensive and lengthy procedures. This limits their throughput and hence determines a need to modify ELISA procedures to enhance their efficiency. We have previously described modifications of the transferrin ELISA procedure incorporating simultaneous addition of antigen and detection antibody and elimination of some washing steps, which significantly improved the performance of the method. In parallel the use of automated high throughput ELISA platforms and their advantages and limitations were discussed. The transferrin ELISA was used as a model to assess the effectiveness of the proposed modifications and could be extended to embrace other assays. Here we present our studies on additional optimisation approaches for ELISA techniques comprising preparation of ready-to-use plates and improved binding kinetics of capture and detection antibodies. These optimisations allow for further increase in sample throughput and maximisation of the performance of ELISA procedures. Following the implementation of the proposed modifications the overall duration of the assay was reduced from 4.5 hours to less than 1.5 hours without compromising the accuracy and precision parameters. The modified ELISA procedures could be easily adopted in QC, R&D and other analytical laboratories to replace the conventional methods. This would significantly improve the performance capabilities and economical efficency of the assays without a need to adopt highly expensive technologies.

Biography

Vladimir Gurevich has completed his PhD from the Moscow Academy of Veterinary Science and then worked in various areas of Veterinary and Medical Research. He was awarded several research grants. He is a Senior Scientist of the Bioanalytical Sciences in the Department of the Plasma Product Development Division of the CSL Behring (Australia) Pty Ltd., a leading biopharmaceutical company. His research has been published in many veterinary and medical peer-reviewed journals and presented at national and international conferences.

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