

An Improved Model of a Catheterised Human Bladder for Screening Bactericidal Agents

BioTeSys: Current testing of medical products

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Purpose:

Catheter encrustation and associated blockage by a crystalline *Proteus mirabilis* biofilm constitute a continuous problem in longterm catheterised patients. The objective of the present work was to verify a new, physiological bladder model possessing the ability to show that triclosan-blocking solutions exert bactericidal and bacteriostatic activities.

Material and Methods:

Catheterised sterile infusion bags served as human bladder models. Artificial urine inoculated with *Proteus mirabilis* was administered by a further aperture. Samples for measurement of pH value and microbial count were collected at intervals of 24 h. Upon completion of testing catheter encrustation was assessed and visualised by scanning electron microscopy.

Results:

In contrast to the application of placebo solution, in models filled with triclosan-blocking solution the catheters drained freely for the experimental period. Similar results were obtained for pH values and microbial count. The pH of the artificial urine did not exceed a critical value of pH 7 and the numbers of organisms correspond approximately to the initially inoculated number of organisms.

Conclusion:

In the model developed here, triclosan inhibits the growth of *Proteus mirabilis* over the test period by diffusing into the artificial urine through the catheter balloon. Thus, triclosan acts against the pH increase as well as the formation of a crystalline biofilm. Taken together, the adaptability of this new, physiological model of the human bladder could be shown.

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About BioTeSys:

BioTeSys GmbH in Esslingen (www.biotesys.de) was founded in 1999 and is a spin-off of the Institute for Biological Chemistry and Nutritional Sciences at the University of Hohenheim. BioTeSys is a partner for development and conversion of new concepts in the areas cosmetics, food, and pharmaceuticals (OTC). The spectrum covers screening procedures for the collection of the bioactive potential of substances or substance mixtures, in vitro testing using single cell cultures, co-cultures and different organ models as well as clinical studies. The department of analytics which focuses on HPLC and photometry, is accredited to DIN EN ISO/IEC 17025. All analytical procedures and test parameters used are based, developed and optimised according to physiological guidelines. The results and raised property concentrations therefore denote a direct significance for the estimated biological effects.

As complete service provider in the area of the biological and chemical analysis, the company offers extensive services including the development of new procedures and products for the customer.