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Publication date: 2012

Document Version
Early version, also known as pre-print

Link to publication from Aalborg University

Citation for published version (APA):

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DETECTION AND DESTRUCTION OF RESIDUAL DNA ON SURGICAL STEEL

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WHY? Polymerase chain reaction (PCR) is being used increasingly in the field of clinical microbiology. One of the methods’ advantages is the extreme sensitivity, but this can also be a problem, because even trace contamination with DNA can lead to erroneous diagnosis. This has been the case previously where carry-over of residual microorganisms from improperly cleansed bronchoscopes lead to false-positive PCR results. Current autoclave procedures are known to be adequate for killing of microorganisms, but it is not known whether the routines are sufficient for removal/inactivation of DNA. With molecular biology-based methods for diagnosis it could prove necessary to combine the autoclave step with a DNA removal/inactivation method. Unfortunately, current strategies for removal/destruction of DNA from surfaces are hazardous, corrosive or expensive.

The aim of the current study was therefore to:
1) Develop a non-corrosive, non-hazardous, inexpensive method for making residual DNA non-amplifiable.
2) Devise a protocol for detection of residual DNA on surgical steel instruments
3) Determine whether residual DNA was present after sterilization routines at Aalborg University Hospital.

HOW? Gefrides 2009: “2 h of autoclave treatment will eliminate nanogram quantities of DNA from laboratory consumables”

RESULTS

The simulation at the CSR documented that the current disinfection routines are adequate. If more rigorous DNA-destruction is needed, prolonged autoclaving at 137°C for 120 min can be implemented to provide >10 mio fold reduction in the amount of residual amplifiable DNA.

CONCLUSION


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