# Investigation of Residual Silver Amount into Human Body using Silver/Silver Chloride Electrodes during Intrabody Communications

by

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Abstract

# INVESTIGATION OF RESIDUAL SILVER AMOUNT INTO HUMAN BODY USING SILVER/SILVER CHLORIDE ELECTRODES DURING INTRABODY COMMUNICATIONS

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The silver/silver chloride (Ag/AgCl) electrode is a widely-used electrode type for signal stimulation and detection around the globe during Intra-body communication (IBC) investigations. Silver ions may reside in the human body during the IBC process. This may cause argyria and argyrosis due to the accumulation of silver over time. In this thesis, IBC *in vitro* experiments of both signal stimulation and detection by using Ag/AgCl electrodes are designed and conducted to measure the amount of silver ion residues. For the sake of safety and simplicity, physiological saline and pig skin are used instead of the human in the experiments. The stimulation and detection experiments in galvanic coupling method show that there exists silver ion residual. Even though the result indicates that certain amount of the silver ion residue is remained but still stays within the safety standard in each experiment. Hence, for short term usage, it should be safe by using the Ag/AgCl electrodes in IBC.

**Key words:** silver/silver chloride electrode, intra-body communication, silver residue

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