

# Biomedical Engineering



**BME MS Thesis Defense  
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## **A Study of Protein Expression Changes during Ischemic and Pharmacological Preconditioning of Heart Using Antibody Array Technology**

### **Abstract**

Ischemic and pharmacological preconditioning are two very important methods of strengthening the heart. Both kinds of preconditioning have been known to protect the heart by rendering it resistant to subsequent lethal ischemia by diverse mechanisms. Using high throughput antibody array slides the study compared ischemic preconditioned with control and Resveratrol-fed with control rat heart samples. The results revealed that several proteins had significantly changed expression levels and might have played a role in the preconditioning process. Various cardioprotective proteins responsible for DNA-repair, Anti-apoptosis and Angiogenesis were found to be upregulated and many pro-apoptotic proteins were downregulated. These results were corroborated from the findings that ischemic preconditioned and pharmacologically preconditioned rats were resistant to ischemia reperfusion injury as evidenced by improved left ventricular function, reduced myocardial infarct size and decreased cardiomyocyte apoptosis. Taken together many potential candidates for survival signal pathways that get triggered during cardiac preconditioning were revealed and their relevance in drug targeting can be an interesting topic of further research.