ASSESSMENT OF HUMAN SPERM ACROSOME REACTION USING FLOW CYTOMETRY AND ITS POTENTIAL APPLICATION TO HIGH PHENOTYPIC THROUGHPUT SCREENING

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Abstract Body

Current study deals with establishment of the protocol to assess human sperm acrosome reaction which can be used in high throughput screening and in routine clinic diagnosis. Abnormal acrosome formation or inadequate acrosome reaction leads to decreased fertility rate. Over the years, there has been a lack in establishing a protocol to assess acrosome reaction. Immunofluorescence is the only technique which has been used to assess the acrosomal status but it has not yet been introduced in daily analysis in clinics because of its drawbacks. Immunofluorescence is time consuming, laborious and has high manual error rate. The results obtained from any microscopy techniques are subjective and thus interpretation of acrosomal status might differ with embryologists/researchers. To over come this drawbacks, flow cytometry has been introduced to assess the acrosome reaction/acrosomal status. Due to its less manual error rate and less time invested, flow cytometry stands its potential to be used in clinics for regular diagnosis.

Along with its use in clinics, flow cytometry can also be upgraded to High Throughput Screening (HTS). HTS is used for drug-discovery which can evaluate a high number of sample number (94, 384, 1536 samples) in one cycle. In future this system can be used to test the effects of any particular drug on different parameters of the spermatozoa. This study uses two techniques to conclude a better assay system to assess acrosomal status. This study also uses two different lectins PSA and PNA along with PI which is a cell viability dye and also can check DNA integrity. This study establishes a protocol that can be used in flow cytometry to evaluate acrosomal status and established protocol was also checked in HTS to check its precision and reproducibility.