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ABSTRACT OF THE THESIS

In general the enzymes of glycolysis are located in the intact cell. Numerous enzymes and metabolites have already been found to be present in seminal plasma, for example, adenosine triphosphatase (ATPase), protein kinase, lactate dehydrogenase, glucose-phosphate isomerase, fructose, glucose, citric acid, pyruvic acid, and lactic acid. The presence of these metabolites in seminal plasma suggests that some other glycolytic enzymes may also be present for the catabolism of these metabolites. the aim of this investigation was to demonstrate the presence of pyruvate kinase activity in seminal plasma and to characterize this enzyme in terms of kinetics and regulatory properties.

Pyruvate kinase activity was found in the normospermic (normal), oligospermic (subfertile), azoospermic (infertile) and vasectomized human seminal plasma. The origin of this enzyme as studied by "split ejaculation" technique was most probably the prostate gland.

At least two types of pyruvate kinase activities from human seminal plasma could be distinquished according to their elution patterns from DEAE-cellulose column. On the other hand, only one peak of enzyme activity was found in the human sperm extract.

The kinetic properties of pyruvate kinase from normospermic, oligospermic, azoospermic and vasectomized seminal plasma were compared. The Michaelis-Menten constants for both substrates PEP and ADP were also determined.

In order to elucidate the physiological function of

seminal plasma pyruvate kinase, particularly its role in glycolysis, the catabolism of glucose by glycolysis in human seminal plasma was studied. Approximately 10% of (^{14}C)-metabolite was produced from incubating rat epididymal tissue slice with (U-^{14}C)glucose. When seminal plasma was used under the same condition, (^{14}C)-metabolite was not formed. Under the extensive phosphorylation condition, there was also no significant phosphorylation of seminal plasma pyruvate kinase. Therefore, the physiological and biological function of seminal plasma pyruvate kinase are still not known.