Some Antibiotics As Inhibitors And Activators Of Rat Erythrocyte 6PGD And G6PD

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Abstract— Glucose-6-phosphate dehydrogenase (G6PD) and 6-phosphogluconate dehydrogenase (6PGD) are the two important enzymes of the pentose phosphate pathway which provides reducing power to the cell. G6PD, the rate-limiting enzyme of the pentose phosphate pathway, catalyzes the irreversible conversion of glucose 6-phosphate to 6-phosphoglucono-δ-lactone in the presence of NADP [1]. 6PGD is the third enzyme in the pentose phosphate pathway. G6PD is associated with some human diseases including cancer [2]. It was also reported that suppression of 6PGD decreased lipogenesis and RNA biosynthesis and increased reactive oxygen levels in cancer cells, lessening cell proliferation and tumor growth suggesting that 6PGD could be an anticancer target. In this study, G6PD and 6PGD were purified with 2'5' ADP-sepharose 4B affinity chromatography in single step. Following purification, we investigated the in vitro effects furosemide, cefazolin, gantamicin and cefuroxime on the activity of rat erytrocyte G6PD and 6PGD. It was determined that gentamicinand furosemide inhibited 6PGD with an IC50 of 13.86 mM and 0.775 mM respectively while cefuroxime and cefazolin increased the activity of the enzyme. On the other hand, gentamicin and furosemide inhibited the activity of the G6PD with an IC50 of 1.75 mM, 0.526 mM respectively whereas cefuroxime and cefazolin increased the activity of the enzyme.

Keywords— G6PD, 6PGD, Antibiotics, Inhibitors, Activators, Rat Erythrocyte.

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