

Kennesaw State University Biochemical Research

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Inhibition of Glutathione Peroxidase

Glutathione peroxidase (GPx) is an intracellular antioxidant enzyme that mediates the amount of hydrogen peroxide present in cells. Through this activity, GPx aids in the regulation of cellular processes that use hydrogen peroxide, including growth and proliferation. It may be desirable to inhibit GPx in certain diseased states, e.g. cancer, where GPx is over expressed. The Tapu lab is making N-heterocyclic compounds that have shown efficiency inhibiting thioredoxin reductase, which is another selenocysteine containing enzyme. Our aim is to test similar compounds to see if they have the ability to inhibit GPx. In order to test these compounds, we have to be able to assay the activity of GPx. I will present my work developing the GPx assay so that we can test the N-heterocyclic compounds from the Tapu laboratory. The GPx assay is coupled to glutathione reductase (GRase). Since oxidized glutathione is a product of the GPx assay, we can monitor GPx activity through the oxidation of NADPH by GRase and use this to test inhibition by the Tapu lab compounds.

KEY WORDS:

Glutathione Peroxidase

Enzyme

Hydrogen Peroxide

N-heterocyclic carbenes

Selenocysteine

Glutathione Reductase

Inhibition