Metal Nitrate Enhanced Green Fluorescent Protein for Nano-Technology

Smith, Lexie (School: Joel E. Ferris High School)

The purpose of this project was to enhance the fluorescence of GFP (green fluorescent protein) using metal nitrates. A one molar solution of the following metal nitrates were made: aluminum nitrate, cobalt nitrate, cupric nitrate, ferric nitrate, lithium nitrate, magnesium nitrate, nickelous nitrate, zinc nitrate, and iron (III) nitrate. GFP was purified following the Bio-Rad protocol. Each metal nitrate was added to a row in a 96-well plate, each well containing a different volume of metal nitrate and 20µl GFP with water to make the final volume of each 200µl. Five wells were also filled with smaller amounts of zinc nitrates, 90µl GFP, and water to make the final volume of each 100µl. Two final wells were filled with 200µl pure GFP and 20µl GFP with 180µl water to be used as controls. The florescence was measured using a Perkin Elmer LS-55 at 395nm and 475nm as the excitation peaks for the GFP. It was found that lithium nitrate enhanced the GFP in some wells while all other metal nitrates suppressed the GFP. In the wells with 90µl GFP and zinc nitrate, the well with 1µl GFP demonstrated to enhance the fluorescence.

Awards Won: