CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Shangida Ahsan

Project Number
S1801

Project Title
Discovery of Novel HIV-1 Integrase Inhibitors

Abstract

Objectives/Goals
Human immunodeficiency virus (HIV) is the fourth leading cause of death worldwide and the first leading cause in Sub-Saharan Africa as noted in a report by UNAID. Infection with HIV eventually leads to Acquired Immune Deficient Syndrome (AIDS), where the body's immune system fails to defend against opportunistic infections. HIV-1 Integrase is one of three important viral enzymes essential for viral replication. Integrase has two catalytic functions: 3' processing using a metal co-factor and integration of viral DNA into cell chromosomes. We aim to identify compounds that inhibit integrase catalytic function. More specifically, the purpose of the project is to find lead molecules for further inhibitory action against wild type integrase in the presence of manganese in vitro.

Methods/Materials
Our methods include an enzymatic assay and PAGE gel electrophoresis.

Results
A random pre-screening of 167 diverse classes of compounds yielded several moderately active compounds and two highly active compounds at 20µg/ml. The data revealed compound p13 D10 and p13 E2 had over 70% inhibition at 20µg/ml.

Conclusions/Discussion
In conclusion, two small molecules show enough activity to investigate their inhibitory profile and binding action. The future goals would be to explore identified lead molecules functional groups effect on inhibitory action.

Summary Statement
To find lead molecules that will have distinct chemical functional groups necessary for inhibitory action against wild type integrase in the presence of manganese in vitro

Help Received
Used lab equipment at USC Health Science campus under the supervision of Dr. Nouri Neamati