

Abstract

The NRI supported High-Throughput, siRNA-Mediated Genome-Wide library screens along with research advances in basic sciences at UNMC/UNL has led to the discovery of molecular targets suitable for therapeutic intervention. Additional high-throughput screens (HTS) against these molecular targets with chemical libraries will help investigators identify small molecules that will be the first step in the “bench to bedside” translation. To facilitate this process the Eppley Institute has invested in a 100K member chemical library that is available to all investigators in the University of Nebraska system. To fully exploit this technology the current set-up of the HTS facility needs to be expanded to include a dedicated robotic liquid-handling system fitted with appropriate heads and work stations to accurately and reproducibly deliver nanoliter volumes of the small molecules. Equally important, the stress associated with repeated freeze/thaw cycles of chemical libraries can lead to adverse effects on the stability and long-term maintenance of these expensive resources. Thus, a plate injectable, multimode detector containing high performance liquid chromatography system is required for monitoring and curating the chemical library.

Here we request funds to expand the abilities of the HTS facility by the addition of pin-tool liquid-handling robotics and analytical systems to handle and maintain chemical libraries. In both cases, this will add unique and important dimensions to the research capabilities of investigators across the University of Nebraska system. These systems will improve the workflow and enhance the throughput of the core facility while at the same time allow for the miniaturization of screens. This will afford both the performance of a greater number of screens while greatly reducing their cost, making chemical screens accessible and affordable for all investigators. NRI support is requested for the initial equipment purchase for the facility detailed in this application. Investigators will pay for associated instrument usage and long-term maintenance through charge backs as well as supplemental support provided by the UNMC/Eppley Cancer Center Support Grant from the National Cancer Institute.