

EXECUTIVE SUMMARY: *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

Tools that enable biological screens are invaluable for drug discovery. Although several FDA approved drugs against HIV-1 exist, AIDS is still a devastating disease around the world, including California. The appearance of resistant viruses together with the terrible side effects of the available drugs, emphasize the need for novel antivirals and better assays to discover them. Here, we propose the construction of a tool that enables production of a vast collection of short proteins in the nucleus of mammalian cells. One of the hallmarks of HIV-1 infection is the insertion of its genome within the genome of the infected cell. By expressing such collection of short proteins of unknown sequence, referred to as a library of random peptides, one can hope to find some that will interfere with the viral genome integration process, which occurs in the nucleus. This tool will thus facilitate the screen for novel drugs against HIV-1, becoming part of the efforts of California in eradicating HIV-1; benefiting AIDS patients around the world and California in particular.

Importantly, peptide libraries can be applied for high-throughput screenings, becoming valuable to California's biotechnology and pharmaceutical industries, especially considering that California is a superpower in biomedical sciences, always at the front line in the battle against HIV-1.