

Intracellular interference of HIV assembly process using ankyrin binder against HIV p24

Chatchai Tayapiwatana
Chiang Mai University, Thailand

Ankyrins involves in a number of essential protein-protein interactions. Unlike intrabodies, ankyrins are composed of highly structured repeat modules characterized by disulfide bridge independent folding. Artificial ankyrin molecules, designed to target viral components, might act as intracellular antiviral agents and contribute to the cellular immunity against viral pathogens such as HIV-1. An ankyrin with three modules named AnkGAG1D4 (16.5 kDa) was isolated from a phage-displayed library of artificial ankyrins by panning against a polyprotein made of the fused matrix and capsid domains (MA-CA) of the HIV-1 Gag precursor. AnkGAG1D4 and MA-CA formed a protein complex with a stoichiometry of 1:1 and a dissociation constant of $K_d \sim 1 \mu\text{M}$, and the AnkGAG1D4 binding site was mapped to the N-terminal domain of the CA. HIV-1 production in SupT1 cells stably expressing AnkGAG1D4 in both N-myristoylated and non-N-myristoylated versions was significantly reduced compared to control cells. The AnkGAG1D4-mediated antiviral effect on HIV-1 was found to occur at post-integration steps, but did not involve the Gag precursor processing or cellular trafficking. Our data suggested that the lower HIV-1 progeny yields resulted from the negative interference of AnkGAG1D4-CA with the Gag assembly and budding pathway. This finding provides a new direction in HIV stem-cell-gene-therapy under the intracellular immunization concept.

Biography

Chatchai Tayapiwatana, Ph.D is currently an Associate Professor of Associated Medical Sciences at Chiang Mai University, Thailand. He acquired his Ph.D in Biotechnology from Chiang Mai University, Thailand in 2001. He has received numerous awards such as "Thesis supervisor of MSD Young Investigator Awards in 2012 from: The Allergy, Asthma, and Immunology Society of Thailand." Dr. Chatchai has published over 41 journals and has reviewed many journals such as the Asian Pacific Journal of Allergy and Immunology, Biotechnology Progress etc.

asimi002@hotmail.com, asimi002@chiangmai.ac.th