Abstract:
Although antiviral strategies are still evolving, the success of anti-retroviral drug development clearly indicates that any virus can be potentially tackled and controlled. Most of the viral diseases are apparently associated with efficient viral replication. And many antiviral drugs attempt to interfere with viral replication. The discovery of inhibitors of viral replication is dependent on understanding the key events taking place at the molecular level during viral infection. All the essential steps during the viral life cycle are potential targets for antiviral drugs. However, several steps of the viral life cycle remain incompletely characterized, and therefore cannot be effectively exploited in antiviral strategies. For this purpose, we have been particularly interested in the involvement of host factors in the viral replication and pathogenesis.

We attempted to control HIV-1 and HTLV-I infection in vitro as well as in vivo using our unique NOG mice model through developing novel antagonists against chemokine receptor and NF-kB as targets. These studies were further extended to suppress growth of non-virally induced human tumors in the NOG mice. As is the case with host proteins, viral proteins are also modified post-translationally by several modifications, such as phosphorylation, and ubiquitination, and such modification is pivotal in the regulation of their function. Recently, we found several host factors including the SOCS1, and atypical protein kinase C which appear to be important in HIV-1 Gag trafficking or polarized budding of HIV-1 virion, respectively.

These studies will contribute to understand the pathophysiology of HIV-1 and HTLV-I infection. Also, these results highlight novel drug targets for arresting the HIV particle production in HIV-1 infected cells since the targets belong to the relatively invariable host factors rather than the rapidly evolving viral proteins.