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PATCHARAWEE KAMALANONTH : SYNTHESIS AND EVALUATION OF BENZOFURAN, BENZOXAZOLE AND BENZOTHIAZOLE DERIVATIVES AS POTENTIAL HIV-1 REVERSE TRANSCRIPTASE INHIBITORS. THESIS ADVISORS : JIRAPORN UNGWITAYATORN, Ph.D. CHANPEN WIWAT, Ph.D. 109 p. ISBN 974-662-073-8

Antiviral therapy for acquired immunodeficiency syndrome (AIDS) has focused on the discovery and design of inhibitors for human immunodeficiency virus type 1 (HIV-1) reverse transcriptase (RT). This enzyme plays an important role in the viral replication process and it is not found in human cells. Therefore a number of inhibitors of HIV RT have been developed. Among them, the non-nucleoside RT inhibitors (NNRTI) represent a group of highly potent and specific inhibitors of HIV-1 replication that interact noncompetitively with the enzyme at an allosteric nonsubstrate binding site. This allosteric site is district from, but functionally and also spatially associated with, the substrate binding site.

Our research group has designed and synthesized a new class of non-nucleoside analogs, a phthalimidoalkyl derivatives, and tested for RT inhibitory activity. From our previous study, 3-phthalimidopyridine was found to possess good inhibitory activity against HIV-1 reverse transcriptase (76% inhibition at 1mM).

This present study will explore the effect of changing the phthalimide nucleus to benzofuran, benzoxazole and benzothiazole nuclei in order to improve inhibitory activity. These derivatives consist of aminopyridine derivatives linking to benzofuran, benzoxazole or benzothiazole ring. Evaluation of reverse transcriptase inhibitory activity of these synthesized compounds was performed by using radiometric assay at concentration 200 μg/ml. The most active compound in the benzofuranylalkyl series (compound 32) possesses moderate inhibitory activity with 32% inhibition compared to positive control, an extract of *Clausena excavata* Burm. f. with 50% inhibition. The synthesis of benzoxazole and benzothiazole derivatives could not be accomplished.