

# A Short Note on Current and Novel Inhibitors of HIV Protease

## Abstract

The design, development and clinical success of HIV peptidase inhibitors represent one among the foremost outstanding achievements of molecular drugs. This review describes all 9 presently out there FDA-approved peptidase inhibitors, discusses their pharmacokinetic properties, off-target activities, side-effects, and resistance profiles. The compounds within the varied stages of clinical development are introduced, as well as alternative approaches, aiming at different purposeful domains of HIV PR. The potential of these novel compounds to open new thanks to the rational drug style of human viruses is critically assessed.

**Keywords:** HIV peptidase • protease inhibitors • HAART • resistance development • pharmacokinetic boosting • peptidase dimerization • different inhibitors

## Introduction

The aspartic peptidase of human immunological disorder virus (HIV PR) is chargeable for the cleavage of the infectious agent Gag and Gag-Pol polyprotein precursors into mature, purposeful infectious agent enzymes and structural proteins. This method, known as infectious agent maturation [1]. That ends up in the ultimate morphological rearrangements, is indispensable for production of infectious agent particles. If HIV-PR is repressed, the emerging virions cannot endure to attack different cells and spreading of HIV is therefore stopped. The introduction of HIV peptidase inhibitors (PIs) in 1995 and therefore the application of extremely active anti-retroviral therapy (HAART), i.e., combination of PI with different antiretrovirals, principally inhibitors of the HIV reverse polymerase, resulted in a very immensely reduced mortality and a chronic life expectancy of HIV-positive patients [2]. The success story of the therapeutic use of HIV peptidase inhibitors isn't solely an interesting accomplishment of contemporary molecular drugs. However it additionally represents a unique showcase for the facility and limitations of a structure-based drug style generally. Although the success of HIV PIs has been outstanding and there don't seem to be fewer than 9 of those compounds presently approved by the authority as antiviral agents, for many reasons each the academe as well because the business ought to continue in their effort to develop novel, less attackable compounds. First, there's a drag of medication resistance. The high mutation rate caused by the dearth of proofreading activity of the infectious agent polymerase, the dynamic infectious agent replication in HIV-positive individuals, at the side of potential twin infection and meager result of medication result in fast [3].

## Description

Development and clinical application of specific inhibitors of HIV PR presently once the identification of HIV PR as a legitimate pharmaceutical target represents fascinating and, indeed, probably the most fortunate example of rational drug style within the history of biomedicine. There are a unit presently nine authority approved PIs out there. In

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developed countries the peptidase inhibitors have at the present time a secure position within the therapeutic accumulation for each the initial medical aid and therefore the second-line and salvage treatment. It's additionally extremely probable, that they'll keep this position with additional development of new simpler and fewer unhealthful molecules within the future. Due to their high prices, protease inhibitors area unit within the resource-limited settings used principally as medicine of the second-line medical aid, but within the future a rise of their use is definitely expected. There is continuous want for the event of safer, cheaper medicine, active against the host of multi-resistant HIV species stemming from completely different virus strains, with high antiviral activity, excellent pharmacokinetic properties and tiny off-target activity, imposing low pill burden and tiny side-effect to the patient. Though such a perfect drug ne'er materializes, the analysis on HIV PR and its inhibition can still offer outstanding wealth of knowledge concerning ligand-enzyme and protein-protein interactions, structural malleability of proteins, mechanism of resistance development, pharmacokinetics of a chemotherapeutical in individual compartments of the body, etc.

All this information may well be used (and, indeed, is already being used) for the event of different compounds targeted against different pathogens, different enzymes and different, apparently never-say-die human diseases [4].

### Conflict of Interests

None

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