



# FUSION AND ATTACHMENT INHIBITORS

**NOTE:** several fact sheets describe drugs that are being tested against HIV:

- Fact sheet 410: nucleoside analog reverse transcriptase inhibitors (nukes)
- Fact sheet 430: non-nucleoside analog reverse transcriptase inhibitors (NNRTIs or non-nukes)
- Fact sheet 440: protease inhibitors
- Fact sheet 460: attachment and fusion inhibitors
- Fact sheet 480: immune therapies

*These drugs have not been approved by the Food and Drug Administration (FDA) for use against HIV.*

## ATTACHMENT AND FUSION INHIBITORS

This is a new class of anti-HIV drugs. They are intended to protect cells from infection by HIV by preventing the virus from attaching to a new cell and breaking through the cell membrane. Researchers hope that these drugs can prevent infection of a cell by either free virus (in the blood) or by contact with an infected cell.

Because digestive acids break them down, most of these drugs are given by injections or intravenous infusion.

**AK602** is a CCR5 blocker being developed by Kumamoto University in Japan. It is in early human trials.

**AMD070** by AnorMed blocks the CXCR4 receptor on CD4 T-cells to inhibit HIV fusion. Development is on hold because of liver problems in animal studies.

**BMS-378806** is an attachment inhibitor that attaches to gp120, a part of the virus, not the target cell. It is in Phase I trials.

**GSK 706769** by ViiV Healthcare\* is a new CCR5 antagonist in Phase I trials.

**HGS004** by Human Genome Sciences, a monoclonal antibody CCR5 blocker, successfully completed a Phase II trial.

**Ibalizumab (TNX-355)** by TaiMed Biologics blocks the CD4 receptor. It is a genetically engineered drug, a "monoclonal antibody." It is being studied as an intravenous infusion every two or four weeks. It is administered along with antiretroviral medications. No significant side effects have shown up yet. It is in Phase II trials.

**INCB9471** by Incyte Corporation has successfully completed Phase II trials in healthy volunteers. It has shown very good tolerability. However, Incyte will not conduct further studies. It will license the drug to another company and will stop working in HIV.

**PF-232798** by ViiV Healthcare\* is a CCR5 blocker. It is in Phase II trials.

**PRO 140** by Progenics is now in Phase II trials. It blocks fusion by binding to a receptor protein on the surface of CD4 cells. PRO 140 has been granted fast-track status by the FDA. It is being studied as an intravenous infusion and by subcutaneous injections.

**SCH532706** by Schering is in Phase I studies. It is best used as part of a regimen that includes ritonavir where it can be administered once daily.

**SP01A** by Samaritan Pharmaceuticals is an HIV entry inhibitor in a Phase III trial.

**TBR-652** by Tobira Therapeutics (formerly TAK-652 by Takeda) is a CCR5 blocker. It is in Phase II trials.

**VCH-286** by ViroChem Pharma is a CCR5 antagonist. A Phase II trial has received regulatory approval.

**Vicriviroc (SCH 417690, formerly called Schering D)** by Schering Plough blocks the CCR5 receptor on CD4 cells.

No serious toxicities have been seen. It is in Phase III trials. Early in 2010, Merck announced that it would not seek approval for vicriviroc in treatment-experienced patients. However, they will continue to develop the product for patients just beginning treatment.

## DRUGS NO LONGER IN DEVELOPMENT

The following drugs are no longer being developed for use against HIV:

**AMD3100** (fusion inhibitor) by AnorMed

**Aplaviroc (GW873140)** by GlaxoSmithKline. Development was suspended due to liver toxicity.

**BMS488043 and BMS806** (attachment inhibitors by Bristol-Myers Squibb, replaced by BMS378806

**FP21399** (CCR5 blockers) by Fujii Pharmaceuticals

**PRO542** by Progenics is no longer being developed. Instead, Progenics is focusing on PRO140.

**T-1249** (fusion inhibitor) by Roche and Trimeris – development was halted in early 2004.

**TAK-652** by Takeda is now being developed by Tobira Therapeutics as TBR-652,

\*ViiV Healthcare is a new HIV company. It is a joint venture of Pfizer and GlaxoSmithKline.

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