Table 11: **Pol**

HXB2 Location	Author Location Sequence	Immunogen	Species(HLA)	References
Pol( )	RT( )	HIV-1 infection	human( )	[Buseyne (1998a)]
	• This study showed a correlation between strong CTL memory and breadth of response in 7–12 month old infants, and remaining AIDS-free for the first year of life, higher absolute CD4 and CD8 cells, and lower viral load			
Pol( )	p66( )	HIV-1 infection	human( )	[Zheng (1999)]
	• Protein delivery (gp160 LAV, p66 LAV, and p24 NY5) to human dendritic cells (DC) with liposomes provides enhanced memory CTL response relative to delivery of protein alone • Chloroquine administration enhanced epitope presentation, and brefeldin A and peptide aldehyde inhibitors inhibited antigen presentation, suggesting epitopes were processed by classical proteasome pathway			
Pol( )	Pol( )	HIV-1 infection	human( )	[Wasik (2000)]
	• HIV+ infants that progressed rapidly to AIDS had lower Th1 responses and decreased production of β-chemokines and IL-2 relative to other HIV+ infants • No HIV+ infants had no demonstrable CTL at birth, but Th1 responses accompanied by CTL responses developed in children with slowly progressive disease, and not in rapid progressors • CTLp frequencies were determined by limiting dilution using autologous B cells infected with vaccina/HIV constructs			
Pol( )	Pol( )	rec canarypox vector with HIV-1 gp120 MN, tm/Gag/protease LAI (vCP205), alone or with p24E-V3 MN synthetic peptide (CLTB-36)	human( )	[Salmon-Ceron (1999)]
	• Twenty HIV negative subjects were vaccinated in phase I trial with combinations of vCP205 and CLTB-36 • Immunization with vCP205 induced HIV-1-specific ABs to gp120, V3, and p24 antigens, and CTL immune responses against vCP205 were detected after the fourth immunization in 33% of the subjects against Env, Gag and Pol, but the CLTB-36 peptide did not produce AB or CTL immune responses against p24 or gp160			
Pol( )	Pol( )	HIV-1 infection	human( )	[Betts (1999)]
	• This study demonstrated an inverse correlation between HIV Type I plasma viral load and CTL activity directed against HIV-1 Pol, and stronger combined effects of Pol- and Env-specific CTL, in long-term survivors (LTS) of HIV-1 infection			
Pol( )	Pol( )	HIV-1 infection	human( )	[Aladdin (1999)]
	• *In vitro* measurements of CTL-activity by Cr release assay in bulk culture showed no correlation between CTL-activity (gp120, Gag, Pol and Nef) and disease progression as measured by viral load, CD4 and time to death			

HIV CTL Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Pol( )	Pol(172–219 Clade B)		rec canarypox vaccine expressing HIV-1 Env, Gag, Pol, Nef and protease (vCP300) with or without administration of HIV-1 SF-2 rgp120	human( )	[Gorse (1999)]
	• *In vitro* inducible CTL activity against HIV-1 Env, Gag, Pol, and Nef antigens was observed in 79% (15 of 19) of vaccine recipients • The combination of vCP300 and vP1291 together resulted in an overall increase in CTL induction and detection sensitivity				
Pol( )	RT( )		HIV-1 infection	human( )	[Buseyne (1998b)]
	• In infants with positive CTL responses, most responses showed cross-clade reactivity with somewhat diminished recognition of epitopes from different subtypes				
Pol( )	RT( )		DNA Gag/Pol, Vif, and Env vaccine	murine( )	[Kim (1997b)]
	• A Gag/Pol, Vif or gp160 DNA vaccine, when delivered in conjunction with the plasmid encoding the co-stimulatory molecules B7 and IL-12, gave a dramatic increase in both the cytotoxic and proliferative responses in mice • When IL-12 was present, CTL response could be detected even without *in vitro* stimulation				
Pol( )	RT( )		HIV infection	human( )	[Trickett (1998)]
	• Twelve HIV-1 infected patients were re-infused with their own lymphocytes, cryopreserved from an earlier time point in the infection • Improvement in CD4+ and CD8+ T cells were seen in 7/12, and an increase in the CTL response to Pol was seen in one patient				
Pol( )	RT( )		HIV-1 infection	human( )	[Froebel (1997)]
	• Two HIV-1 infected children with contrasting disease courses were followed longitudinally – one died of AIDS, the other is a long-term non-progressor • Reactivity against Gag, Pol, Env and Tat proteins was tested by PBMC bulk cultured cells reacting with protein expressed in vaccinia constructs in autologous EBV transformed B cells • The child who progressed consistently had CTL against Pol and Tat • The long-term non-progressing child had no detectable CTL, but was heterozygous for a mutation in the CCR5 receptor and for HLA-B49, which has been shown to be associated with slower progression				

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Pol( )	Pol( )		HIV-1 infection	human( )	[Betts (1997)]
	• 6/8 individuals from Zambia infected with C clade virus had CTL that were able to make response to B clade HIV-1 IIIB vaccinia-expressed Gag, Pol and Env proteins • A vigorous cross-clade response was not limited to a particular protein, and the level of recognition of different proteins varied among the six patients				
Pol( )	RT( )		HIV-1 infection	human( )	[De Maria (1997)]
	• CD3+ cells that also carry a natural killer cell receptor (NKR+) can exhibit down regulation of T cell function • Anti-NKR IgM MAb masked this inhibitory function and increased HIV-1 specific CTL activity in phytohemagglutinin-activated PBMC cultured in the presence of IL-2 from 3/5 patients, and in one other case anti-NKR MAb brought HIV-1 specific CTL activity to detectable levels				
Pol( )	Pol( )		HIV-1 exposure	human( )	[Goh (1999)]
	• 13/37 exposed uninfected individuals with repeated high-risk sexual exposure had HIV-1 specific CTL against Env, Gag, Pol, or a combination of proteins – CTL activity was correlated with a CCR5 wildtype genotype • In this group, the highest CTLp frequencies were directed at Gag, but the most common response was to Env and four individuals had responses to multiple HIV-1 proteins				
Pol( )	Pol( )		canarypox HIV vaccine	human( )	[Evans (1999)]
	• A canarypox vaccine expressing gp120, gp41, Gag, Protease, Nef and Pol CTL epitopes gave rise to CTL that could be detected in 61% of the volunteers – responses to Gag, Env, Nef and Pol were detected 3–6 months after the last vaccination				
Pol( )	Gag/Pol( )		DNA vaccine + CD80 and CD86 expression cassettes	chimpanzee( )	[Kim (1998)]
	• The study explores the use of co-stimulatory molecules co-expressed with an HIV-1 immunogen in a DNA vaccine to enhance the immune response – co-expression of CD86, but not CD80, dramatically increased both HIV Env and Gag/Pol specific CTL and Th proliferative responses				
Pol( )	Pol( )		HIV-1 infection	human(A*0201 and Cw*08)	[Shacklett (2000)]
	• HIV-1 specific, MHC class I-restricted CTL killing was detected in duodenal and rectal gut associated lymphoid tissue (GALT) sites from three infected individuals – the distribution of class I restricted CTL was different in the peripheral blood samples and GALT samples				