

Table 14: **Env**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Env()	gp120()		gp120 or gp160 DNA vaccine	murine()	[Shiver (1997)]
					<ul style="list-style-type: none"> • DNA vaccinations of BALBc mice with a gp120 or gp160 DNA vaccine elicited a strong T-cell proliferative response with Th1-like secretion of γ interferon and IL-2, with little or no IL-4, as well as antigen specific gp120 Abs • An intramuscular route of inoculation gave a stronger proliferative response than intradermal • A proliferative response could be detected in all lymph tissues tested: spleen, PBMC, and mesenteric, iliac, and inguinal lymph nodes
Env()	gp120()		DNA gag/pol, or env vaccine	murine()	[Kim (1997b)]
					<ul style="list-style-type: none"> • A gp160 DNA vaccine, when delivered in conjunction with the plasmid encoding the co-stimulatory molecule CD86, gives an increase in the proliferative responses to gp120 in mice
Env()	gp120()			human()	[De Berardinis (1997)]
					<ul style="list-style-type: none"> • Sequences flanking helper T-cell immunogenic domains can be important for immunogenicity
Env()	gp120()	polyclonal	HIV-1 infection	human()	[Rosenberg (1997)]
					<ul style="list-style-type: none"> • A strong proliferative response to p24 and gp160 was found in a healthy long term survivor
Env()	gp120()	polyclonal	HIV-1 infection	Macaca nemest- rina()	[Kent (1997)]
					<ul style="list-style-type: none"> • Macaca nemestrina can be infected with HIV, and clear the infection within 6 months, so it is of interest to examine their initial immune response • A strong proliferative response against gp160 with IL-4 production, indicating a Th2 response, was found with 4 weeks of infection • The gp160 proliferative response by 8 weeks produces both IL-4 and γ interferon, indicating both Th1 and Th2 responses
Env()	gp120()	polyclonal	gp160 DNA vac- cine, env protein boost	Macaca mulatta()	[Letvin (1997)]
					<ul style="list-style-type: none"> • Vaccination of Macaca mulatta (Rhesus monkeys) with a HXBc2 env DNA prime and a protein boost elicited a T-cell proliferative response, a CTL response, and type-specific neutralizing antibodies • Vaccinated animals challenged with SHIV-HXB2 were protected from infection
Env()	gp120()	polyclonal	env + rev MN DNA vaccine	human()	[MacGregor (1998)]
					<ul style="list-style-type: none"> • An HIV DNA env and rev vaccine given to 15 asymptomatic HIV+ individuals at three different dosages, 30, 100 or 300 μg, was safe • All three groups showed an increased proliferative response after vaccination

HIV Helper-T Cell Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Env()	Env()		HIV-1 exposure	human()	[Mazzoli (1997)]
					<ul style="list-style-type: none"> • Study of HIV-specific immunity in seronegative partners of HIV-positive individuals – Env peptides could stimulate IL-2 production in 9/16 HIV-exposed seronegative individuals, and only 1/50 low-risk controls • Exposed uninfected produced more IL-2 and less IL-10 than HIV-infected individuals • 8/9 of those whose PBMC produce IL-2 in response to Env peptides had concomitantly detected urinary or vaginal tract anti-HIV IgA
Env()	Env()		HIV-1 infection	human()	[Plana (1998)]
					<ul style="list-style-type: none"> • Patients from later stages of infection given HAART do not show restoration of HIV-1 specific Th proliferative responses
Env()	Env()		HIV-1 infection	human()	[Kelleher (1998a)]
					<ul style="list-style-type: none"> • Env and gag Th epitopes were pooled and used to test Th proliferative responses after IL2 therapy – while IL2 therapy causes an increase in CD4+ lymphocyte count, it does not increase HIV-1 specific proliferative responses
Env()	gp160()		HIV-1 infection+rgp160 vaccine	human()	[Ratto-Kim (1999)]
					<ul style="list-style-type: none"> • Vaccinations with rgp160 did not enhance Th immunoproliferative responses in individuals who were immunized every 2 months for 5 years starting early in infection
Env()	gp160()		rgp160 MN vaccine	human()	[Gorse (1999)]
					<ul style="list-style-type: none"> • Helper T-cell memory responses were induced by MN rgp160 as measured by proliferation and Th1 and Th2 cytokine release – this response could be boosted by MN rgp120
Env()	gp120()		SF2 envelope IS-COM or chimeric Fowlpox vaccine	Macaca mulatta()	[Heeney (1998)]
					<ul style="list-style-type: none"> • Vaccinated monkeys with the highest level of Th1 and Th2 responses and the highest levels of NABs were protected against a SHIV SF13 challenge – the ISCOM strategy gave more potent anti -gp120 responses than the Fowl pox strategy • When animals were challenged 4 months after boost, those that maintained high levels of HIV-1 specific IFN-gamma responses, indicative of a Th 1 response, were still protected
Env()	()		DNA env and rev vaccine	human()	[Boyer (1999)]
					<ul style="list-style-type: none"> • A DNA vaccine containing env and rev was tested for safety and immune response in 15 HIV+ asymptomatic individuals • Enhanced proliferative activity and higher levels of MIP-1α were detected in multiple study subjects
Env()	Env()		vaccinia virus env vaccine	murine BALB/c()	[Rodriguez (1999)]
					<ul style="list-style-type: none"> • A chimeric GM-CSF-env antigen expressed in a vaccinia vector elicits a higher HIV-specific env cellular immune response than when native env is used

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Env()	Env()		HIV-DNA prime - HIV vaccinia boost	Macaca nemestrina()	[Kent (1998)]
			<ul style="list-style-type: none"> • Priming with an HIV-DNA vaccine and boosting with a vaccinia construct induced greater levels of HIV T-cell immunity than either vaccine alone • The proliferative response to Env and Gag after the DNA vaccination had a mean SI of 1.5-4, but after boosting with rHIV-fowlpox virus, there was a 6-17 fold increase in the mean SI for HIV Gag and Env. The T help response happened despite a fall in antibody titers, suggesting that the Th response was primarily Th1, not Th2. The CTL response was also enhanced 		
Env()	gp120()		10 different vaccines	Macaca mulatta()	[Heeney (1999)]
			<ul style="list-style-type: none"> • Ten different vaccine strategies were evaluated for their ability to protect from infection in a Rhesus macaque model using a non-pathogenic SHIV challenge. Protection correlated with the magnitude of NAb responses, beta-chemokines, and a balanced Th response. DNA, protein+adjuvant, VLP and ISCOM vaccines were tested. • HIV-1/ISCOMS gave the highest NAb titers, Th1 and Th2 responses, was the only vaccine formulation tested with a detectable CTL response, and gave enhanced beta-chemokine production. 		
Env()	gp160()		rgp160 MN	human()	[Kundu (1998)]
			<ul style="list-style-type: none"> • This study followed 10 HLA-A2 asymptomatic HIV+ individuals as they received MN gp160 vaccinations over a two year period. • There was an increased lymphoproliferative response but this did not impact viral load or CTL response. 		
Env()	gp120()		rgp120, DNA env, gp120/ISCOM	Macaca mulatta()	[Verschoor (1999)]
			<ul style="list-style-type: none"> • 16 Rhesus Macaques were vaccinated with either an epidermal SF2 gp120 DNA vaccine, rgp120 with a MF59 adjuvant, or rgp120 incorporated into ISCOMs • DNA vaccination elicited a weak Th type 1 response and low antibody response, rgp120/MF59 triggered a strong antibody response, and rgp120/ISCOM induced both kinds of T helper cells, and a strong humoral response. • Animals were challenged with SF13 SHIV. Early induction of Th type 1 and type 2 responses with the rgp120/ISCOM vaccine provided the most effective immunity, protecting from infection 		
Env()	Env()		DNA vaccine + CD80 and CD86 expression cassettes	murine()	[Kim (1998)]
			<ul style="list-style-type: none"> • 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 		
Env()	Env()		ALVAC-HIV vaccine	human()	[Salmon-Ceron (1999)]
			<ul style="list-style-type: none"> • A live attenuated canarypox vector expressing MN gp120 and LAI gp41/gag/protease could induce CTL and a lymphoproliferative response in healthy uninfected volunteers 		

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