

Table 1.5: **Nef**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Nef(1-20)	Nef(1-20 LAI)	MGGKWSKSSVVGWPTVRERM	Nef, Rev and Tat DNA immunization ^a	murine(H-2 ^d)	[Hinkula (1997)]
		<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 			
Nef(16-35)	Nef(16-35 LAI)	VRERMIRRAEPAADGVGAASR	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
		<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 			
Nef(31-50)	Nef(31-50 LAI)	GAASRDLEKHHGAISSNTAA	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
		<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 			
Nef(45-69)	Nef(45-69 BRU)	SSNTAATNAACAWLEAQ-EEEEVGFP	rec Nef	rat and chim-panzee()	[Estaquier (1992)]
		<ul style="list-style-type: none"> • Antigenic domain: ATNAACAWL, priming with peptide enhanced subsequent Ab response to Nef protein immunization 			
Nef(46-65)	Nef(46-65 LAI)	SNTAATNAACAWLEAQEEEE	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
		<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 			
Nef(61-80)	Nef(61-80 LAI)	QEEEEVGFPVTPQVPLRPMT	Nef, Rev and Tat DNA immunization	murine(H-2 ^b)	[Hinkula (1997)]
		<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 			

HIV Helper-T Cell Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Nef(66–97)	Nef(66–97 LAI)	VGFPVTPQVPLRPMTYK- AAVDLSHFLKEKGGGL	Lipopeptide vaccine	human()	[Gahery-Segard (2000)]
			<ul style="list-style-type: none"> • Anti-HIV lipopeptide vaccine consisting of six long peptides derived from Nef, Gag and Env HIV-1 proteins modified by a palmitoyl chain was administered in a phase I trial • A CD4+ T cell proliferative response to at least one of the six peptides was observed in 9/10 vaccinees – 5/10 reacted to this Nef peptide • 9/12 tested mounted a CTL responses to at least one of the six peptides, each of the six peptides elicited a CTL response in at least one individual • 5/12 tested had an IgG response to this peptide 		
Nef(76–95)	Nef(76–95 LAI)	LRPMTYKAAVDLSHFLKEKG	Nef, Rev and Tat DNA immunization	murine(H-2 ^b)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(91–110)	Nef(91–110 LAI)	LKEKGGLEGLIHSQRRQDIL	Nef, Rev and Tat DNA immunization	murine(H-2 ^b)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(98–112)	Nef(98–112 BRU)	EGLHSQRRQDILD	rec Nef	chimpanzee()	[Estaquier (1992)]
			<ul style="list-style-type: none"> • Peptide alone could stimulate monkey T-cells in the absence of carrier protein – required carrier protein in rat 		
Nef(106–125)	Nef(106–125 LAI)	RQDILDWYHTQGYFPDWQ	Nef, Rev and Tat DNA immunization	murine(H-2 ^b)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		

HIV Helper-T Cell Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Nef(117-147)	Nef(117-147 LAI)	TQGYFPDWQNYTPGPGV- RYPLTFGWGCKLVP	Lipopeptide vaccine	human()	[Gahery-Segard (2000)]
			<ul style="list-style-type: none"> • Anti-HIV lipopeptide vaccine consisting of six long peptides derived from Nef, Gag and Env HIV-1 proteins modified by a palmitoyl chain was administered in a phase I trial • A CD4+ T cell proliferative response to at least one of the six peptides was observed in 9/10 vaccinees – 1/10 reacted to this Nef peptide • 9/12 tested mounted a CTL responses to at least one of the six peptides, each of the six peptides elicited a CTL response in at least one individual • 10/12 tested had an IgG response to this peptide 		
Nef(121-140)	Nef(121-140 LAI)	FPDWQNYTPGPGVRYPLTFG	Nef, Rev and Tat DNA immunization	murine(H-2 ^b)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(136-155)	Nef(136-155 LAI)	PLTFGWGCKLVPVEPKVVEE	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(151-170)	Nef(151-170 LAI)	DKVEEANKGENTSLHPVSL	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(166-185)	Nef(166-185 LAI)	HPVSLHGMDDPEREVLWRF	Nef, Rev and Tat DNA immunization	murine(H-2 ^{b,d})	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		

HIV Helper-T Cell Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Nef(181-205)	Nef(181-205 LAI)	LEWRFDLSRLAFHHVARE-LHPEYFKN	Nef, Rev and Tat DNA immunization	murine(H-2 ^d)	[Hinkula (1997)]
			<ul style="list-style-type: none"> • Stronger, broader responses were observed in animals vaccinated with DNA epidermally rather than with intramuscular protein • Some proliferative response to vaccination was observed to peptides throughout Nef and Tat, less for Rev 		
Nef(182-205)	Nef(182-205 LAI)	EWRFDLSRLAFHHVAREL-HPEYFKN	Lipopeptide vaccine	human()	[Gahery-Segard (2000)]
			<ul style="list-style-type: none"> • Anti-HIV lipopeptide vaccine consisting of six long peptides derived from Nef, Gag and Env HIV-1 proteins modified by a palmitoyl chain was administered in a phase I trial • A CD4+ T cell proliferative response to at least one of the six peptides was observed in 9/10 vaccinees – 4/10 reacted to this Nef peptide • 9/12 tested mounted a CTL responses to at least one of the six peptides, each of the six peptides elicited a CTL response in at least one individual • None of the 12 tested had an IgG response to this peptide 		
Nef(185-200)	Nef(183-198)	FDSRLAFHHVARELHP	HIV-1 infection	human()	[Ranki (1997)]
			<ul style="list-style-type: none"> • T-cell response to this epitope persisted after seroreversion 		
Nef()	Nef()		HIV-1 infection	human()	[da Silva & Hughes(1998)]
			<ul style="list-style-type: none"> • This study compares the level of variation in Nef CTL epitopes to helper and MAb epitopes from the same region • CTL epitopes tend to be more conserved than either helper or MAb epitopes and there are stronger functional constraints in the regions where CTL epitopes cluster. 		
Nef()	Nef()		B clade Vif-Vpu-Nef DNA-vaccine pVVN-P	murine(H-2 ^d)	[Ayyavoo (2000)]
			<ul style="list-style-type: none"> • Splenocytes from BALB/c mice immunized with pVVN-P DNA were incubated with Vif, Vpu or Nef antigens for 3 days and assayed for IL-4 and IFN-γ levels • Antigen stimulation increased IFN-γ production in pVVN-P immunized mice, indicating a Th1 response • IL-4 production was not significantly changed after antigen stimulation compared to control levels • Cross-clade CTL activity was also observed: A, B clade, CRF01(AE) clade antigens could serve as targets for the B clade immunization stimulated CTL – an HIV-1 AC recombinant, however, did not stimulate a CTL response, but was expressed at lower levels on the target cell 		

HIV Helper-T Cell Epitopes

HXB2 Location	Author Location	Sequence	Immunogen	Species(HL/A)	References
Nef()	Nef()		DNA constructs encoding HIV-1 genes nef, rev or tat	human()	[Calarota (1999)]
			<ul style="list-style-type: none"> 9/9 HIV-1+ subjects were given one of three DNA vaccinations for nef, rev or tat, and novel proliferative and CTL responses were generated The nef DNA immunization induced the highest and most consistent CTLp activity, IFN-γ production, and IL-6 and IgG responses Highly active antiretroviral treatment (HAART) did not induce new HIV-specific CTL responses but reduced viral load, while DNA vaccination induced new immune responses but did not reduce viral load – thus this is a potentially complementary and promising combination 		