

IFN- β -1b: potent antiviral activity against SARS coronavirus

Interferon (IFN)- α -2b, IFN- β -1b and IFN- γ -1b inhibit replication of the SARS* coronavirus *in vitro*, and IFN- β -1b is the most potent, report researchers from Germany.

They assessed the antiviral potential of IFN- α -2b [Intron A], IFN- β -1b [Betaferon] and IFN- γ -1b [Imukin] against the FFM-1 and Hong Kong isolates of the SARS coronavirus. Specifically, the researchers visually scored the cytopathogenic effects of the FFM-1 and Hong Kong isolates in Vero and Caco2 cells that were treated with the IFNs 24 hours before, and during, infection.

IFN- β -1b was the most potent antiviral in Vero cells, followed by IFN- γ -1b and then IFN- α -2b [see table]. In Caco2 cells, IFN- β -1b was more potent than IFN- α -2b, and IFN- γ -1b was completely ineffective. When the drugs were added after infection of Vero cells with FFM-1 (1 hour adsorption period), only IFN- β -1b was effective ($EC_{50}^{**} = 560$ IU/mL). "Therefore, only interferon β can be used as an antiviral agent after infection", comment the researchers. Finally, FFM-1 virus replication in Vero cells was dose-dependently inhibited by IFN- β -1b (applied before and during infection).

Table. Inhibition of cytopathogenic effects of FFM-1 and Hong Kong isolates by interferons

	EC_{50}^a (IU/mL)	Selectivity Index ^b
Vero cells/FFM-1 isolate		
IFN- α -2b	4950	> 2
IFN- β -1b	95	> 105
IFN- γ -1b	2500	> 4
Vero cells/Hong Kong isolate		
IFN- α -2b	6500	> 1.5
IFN- β -1b	105	> 95
IFN- γ -1b	1700	> 5.9
Caco2 cells/FFM-1 isolate		
IFN- α -2b	1530	> 6.5
IFN- β -1b	21	> 476
IFN- γ -1b	> 10 000	NC ^c
Caco2 cells/Hong Kong isolate		
IFN- α -2b	880	> 11.4
IFN- β -1b	9.2	> 1087
IFN- γ -1b	> 10 000	NC
^a concentration required to inhibit the cytopathogenic effect by 50%		
^b ratio of the concentration required to reduce cell viability by 50% to the concentration required to inhibit the cytopathogenic effect by 50%		
^c not calculable		

The researchers conclude that "interferon β could be the drug of choice, alone or in combination with other antiviral drugs, in the treatment of SARS".

* severe acute respiratory syndrome

** concentration required to inhibit the cytopathogenic effect by 50%