

Poster presentation

Open Access

A Unique Cross-reactive HIV-1 Neutralizing CD4i Human Monoclonal Antibody Containing Only a Heavy Chain: Engineering a Domain Antibody and Improvement of Its Potency and Solubility

Mei-Yun Zhang^{1,2}, Samitabh Chakraborti*^{‡1}, Ponraj Prabakaran¹, Vidita Choudhry¹ and Dimiter S Dimitrov¹

Address: ¹Protein Interactions Group, LECB, CCR, NCI-Frederick, NIH, Frederick, MD 21702 and ²BRP, SAIC-Frederick, Inc., NCI-Frederick, Frederick, MD 21702

Email: Samitabh Chakraborti* - schakraborti@ncifcrf.gov

* Corresponding author ‡ Presenting author

from 2005 International Meeting of The Institute of Human Virology
Baltimore, USA, 29 August – 2 September 2005

Published: 8 December 2005

Retrovirology 2005, **2**(Suppl 1):P22 doi:10.1186/1742-4690-2-S1-P22

Naturally occurring human antibodies containing only heavy chain are very rare. All antibodies specific for HIV identified until now contain both light and heavy chains. By screening an immune HIV phage library we have identified an antibody, m12, that expresses only a heavy chain. The Fd of this heavy chain behaves as a CD4i antibody and binds gp120 complexed with CD4 better than gp120 alone. This antibody was further engineered to a single domain antibody, which is the smallest possible antibody fragment that still exhibits binding to the antigen. The domain m12 neutralized HIV isolates from different clades but had low solubility and was difficult to express. To further improve its solubility and potency we generated a mutant library. This library is being screened against gp120 and gp120-CD4. The results will be discussed if they become available. This unique domain antibody could have applications for design of potent HIV inhibitors.

Members of our group, including You-Qiang Wu, Igor A. Sidorov, Xiaodong Xiao, and Bang Vu contributed to these results.