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Med**

LKS Faculty of Medicine
AIDS Institute
香港大學愛滋病研究所



Tandem bispecific antibody protects fully and induces prolonged viremia control against SHIV_{SF162P3} infection

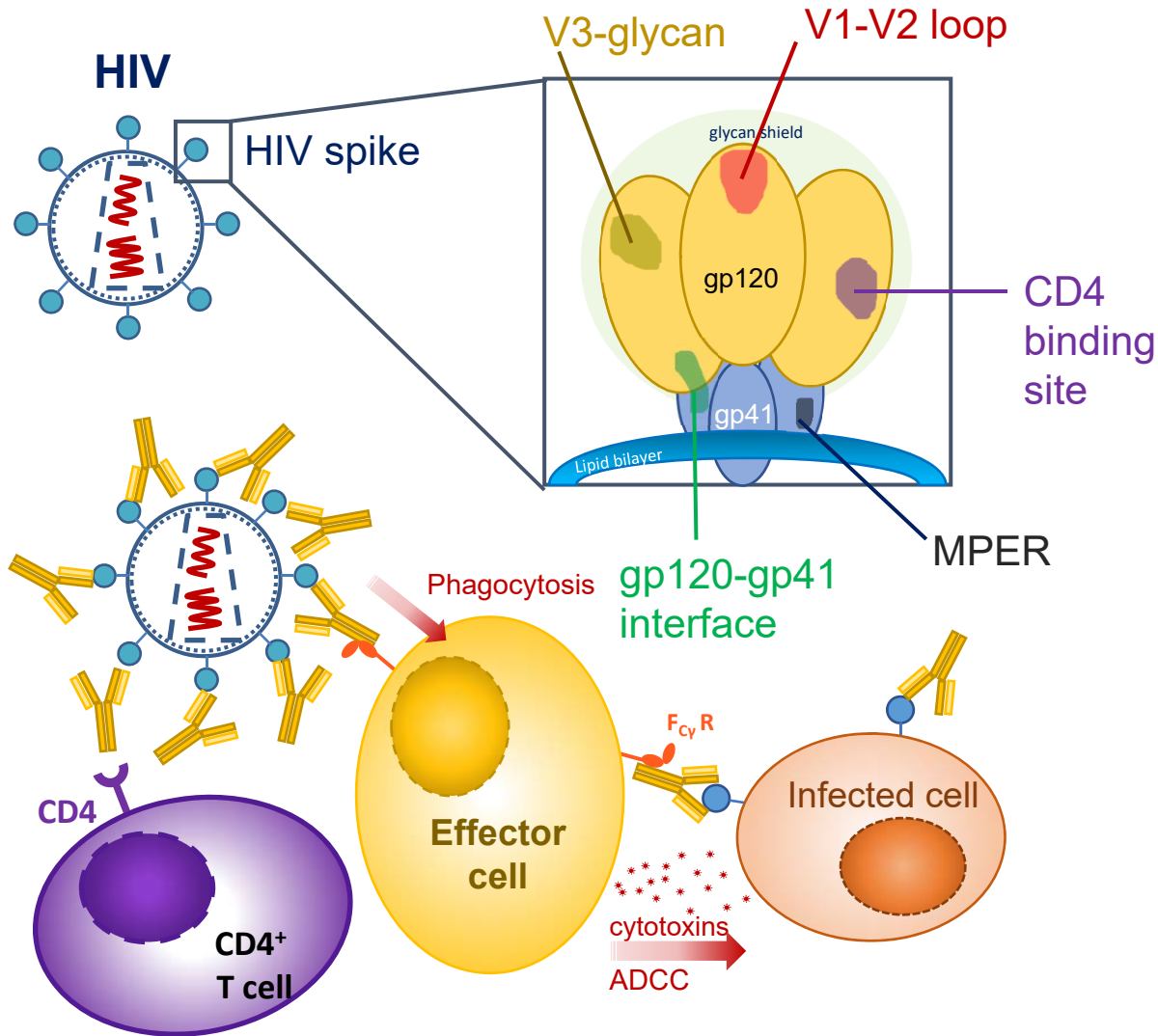
Mengyue NIU

AIDS Institute, The University of Hong Kong

2019 HIV & HBV Cure Forum
Mexico City, Mexico



Broadly Neutralizing Antibody(bNAbs)



- Neutralize multiple HIV-1 viral strains
- Target conserved epitopes on HIV Env
- **Neutralization**
- **Fc-mediated effector function**
- **Induce immune response**

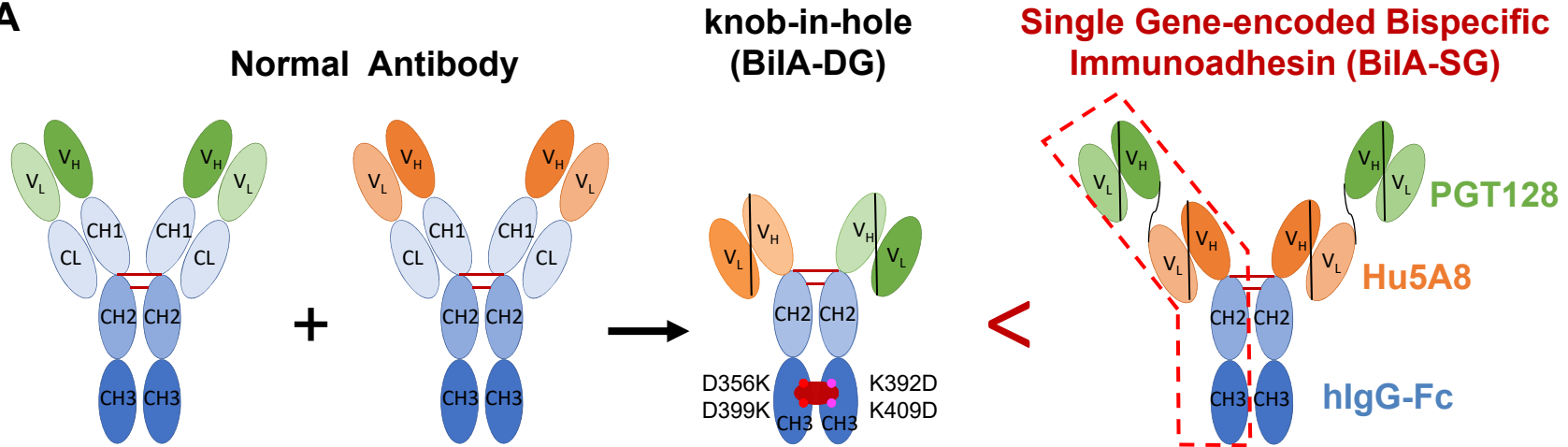
Natural resistant viruses exist



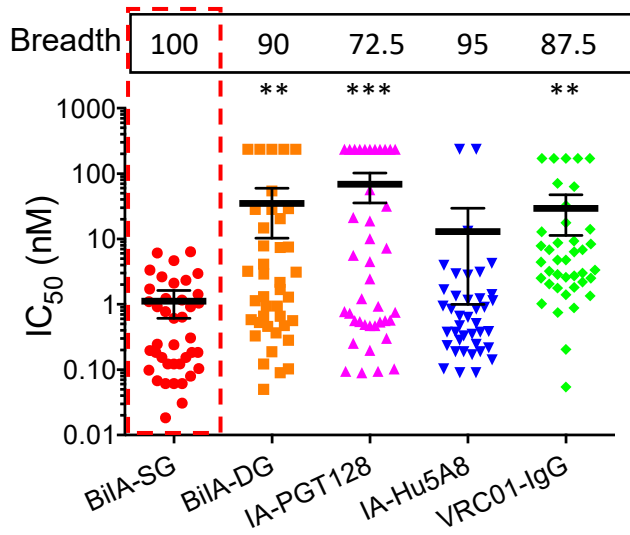
BilA-SG displays significantly enhanced potency and breadth against HIV-1



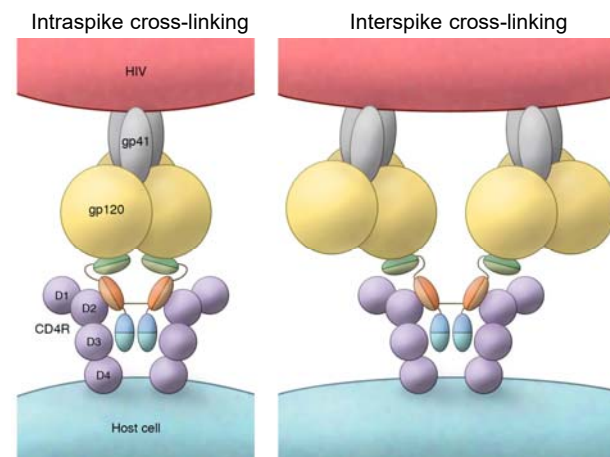
A



B



C



Wu et al. *J Clin Invest.* 2018.
Guido Ferrari. *J Clin Invest.* 2018

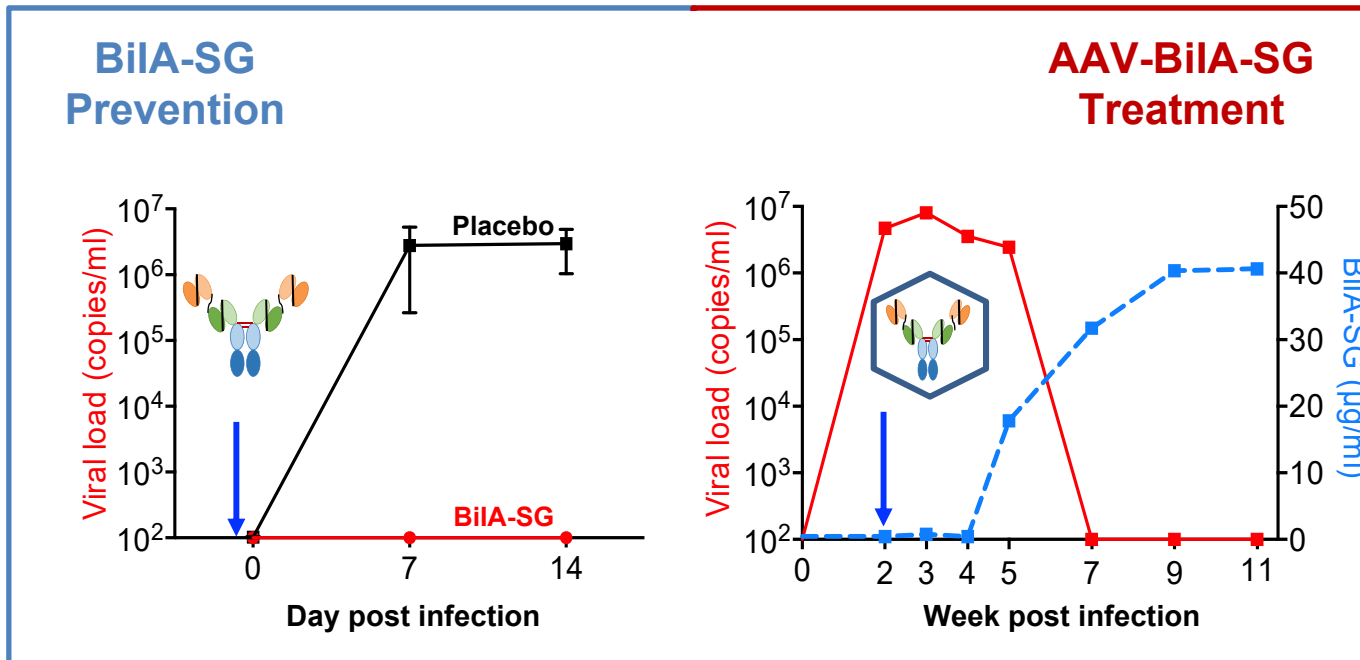


Tandem bispecific neutralizing antibody eliminates HIV-1 infection in humanized mice



JCI The Journal of Clinical Investigation

Xilin Wu, Jia Guo, **Mengyue Niu**,¹... and Zhiwei Chen*



Wu et al. *J Clin Invest.* 2018.

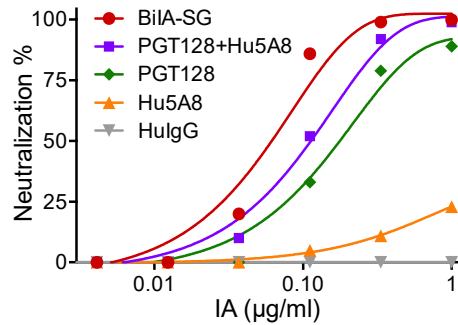
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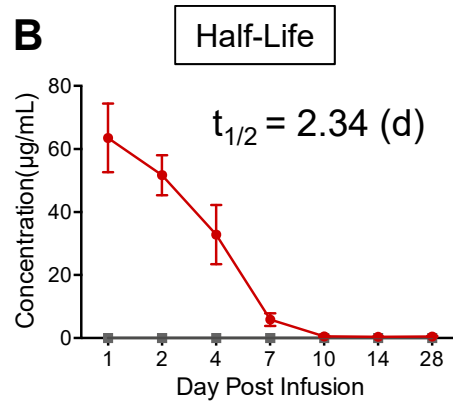
BiA-SG can potently neutralize SHIV_{SF162P3}



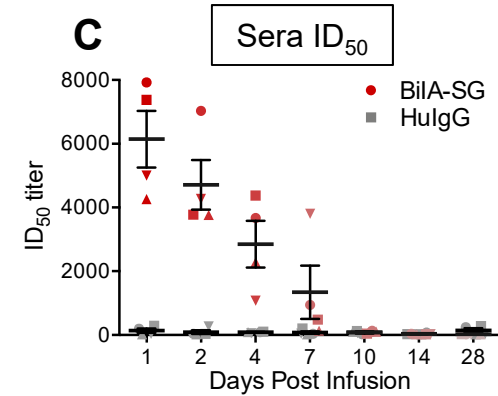
A



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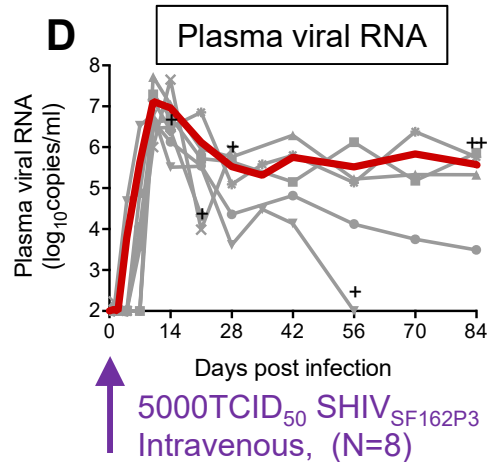


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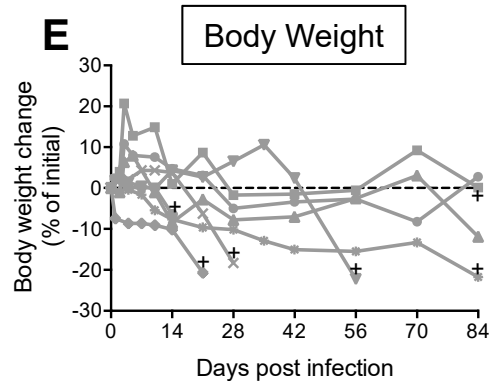


High dose intravenous SHIV_{SF162P3} infection is highly pathogenic for Chinese rhesus macaques

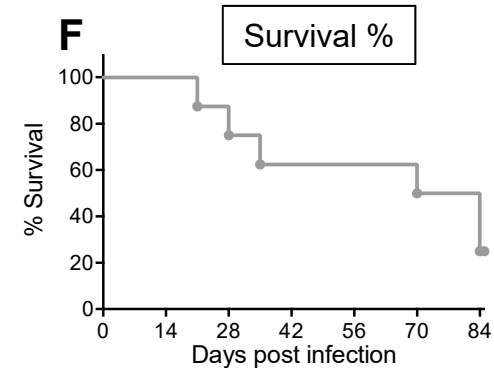
D



E



F

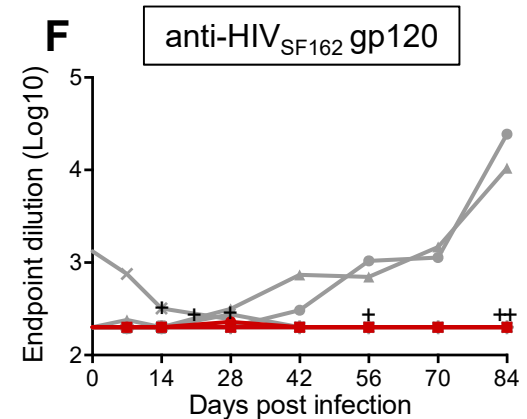
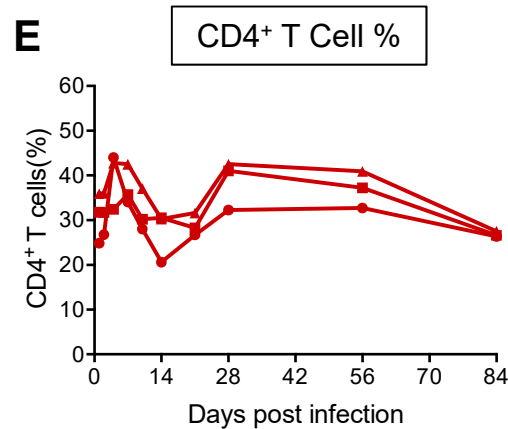
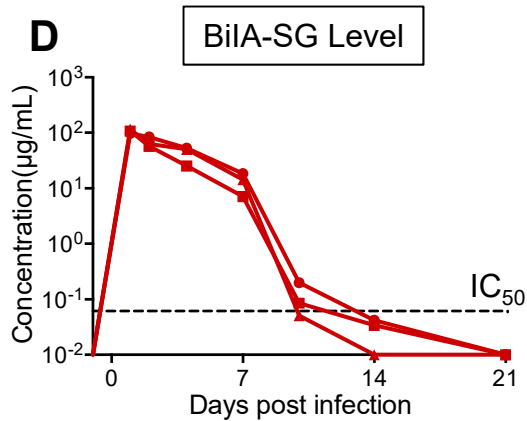
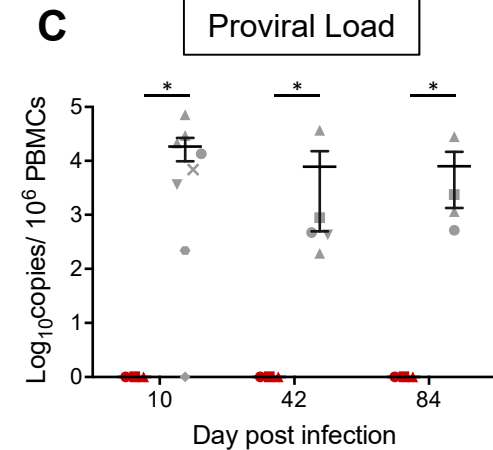
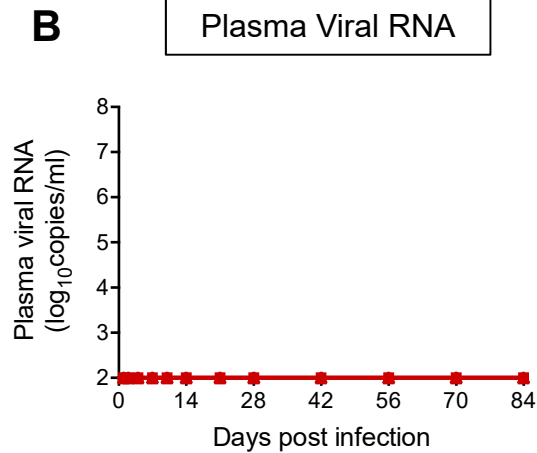
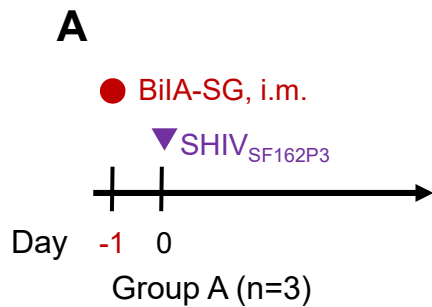


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Prior injection of BiA-SG confers fully protection against high dose SHIV challenge

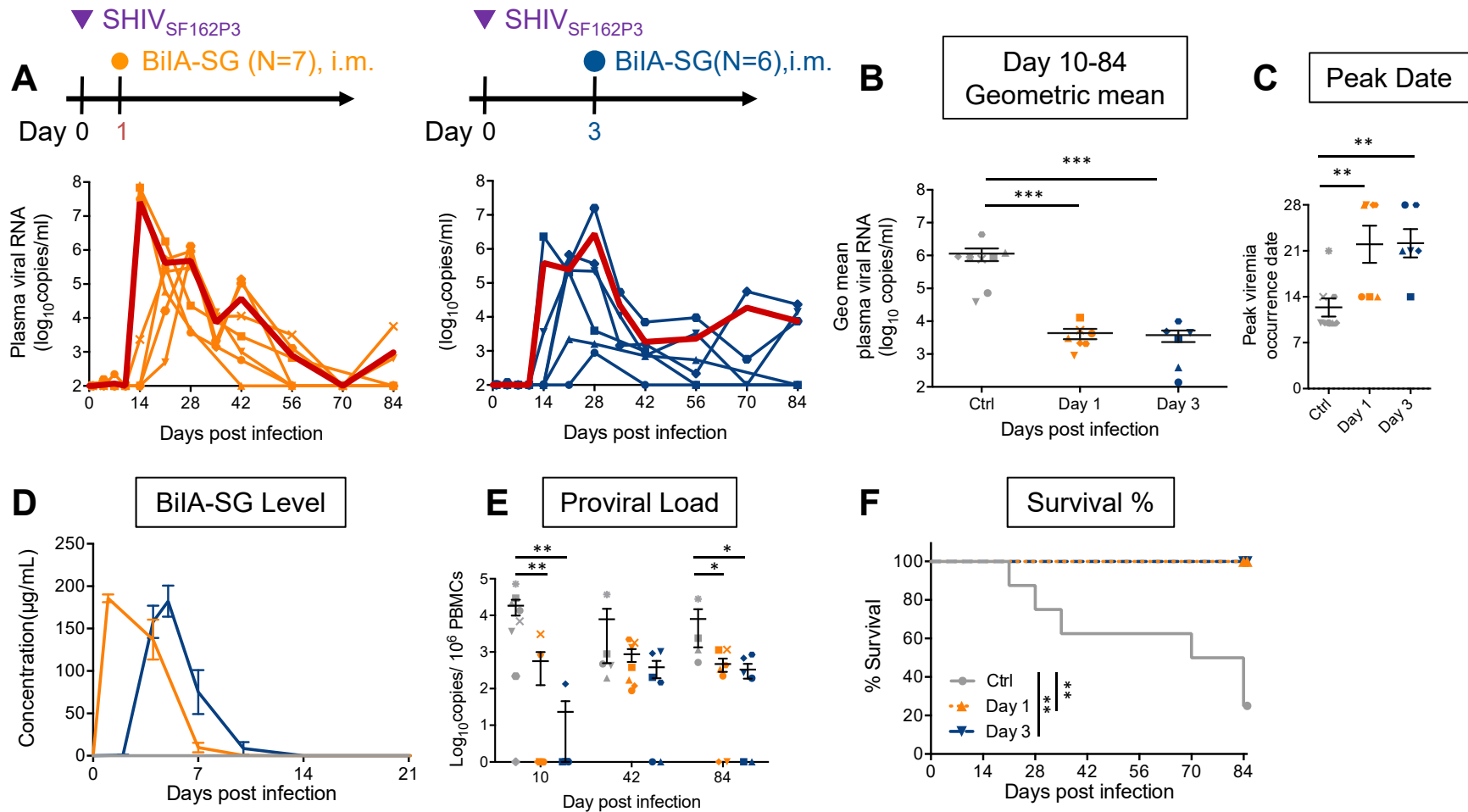


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Single early treatment of BiIA-SG converts lethal SHIV infection into sustained control

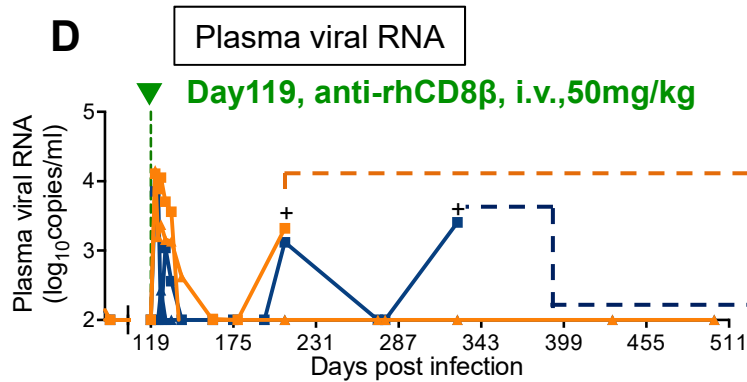
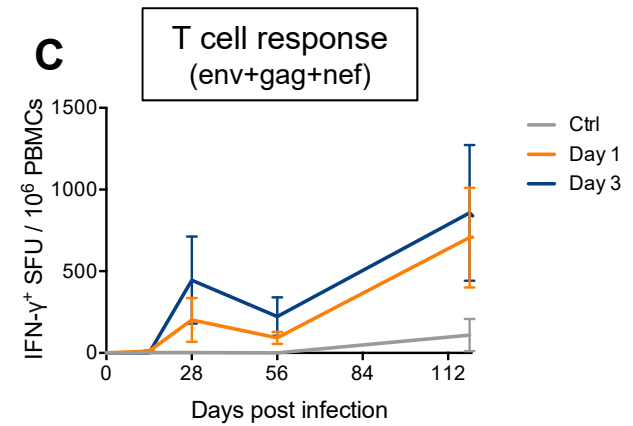
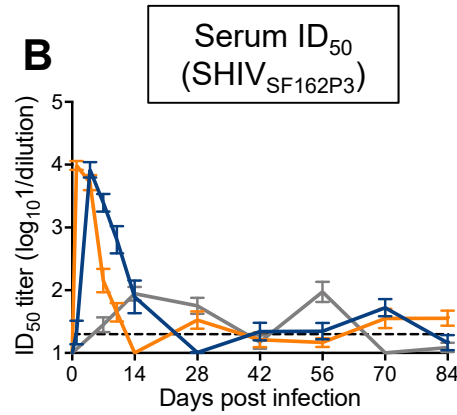
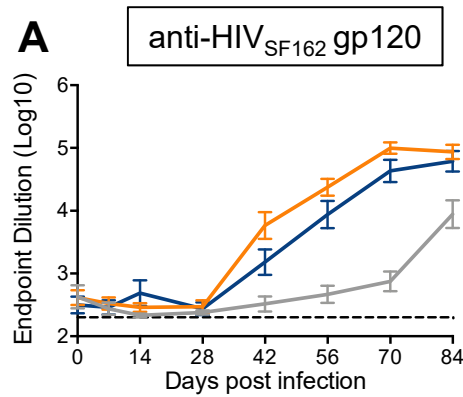


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Single early treatment of BiA-SG induces stronger humoral and cellular response



| | V3 | | |
|-------------------------|---|-----|-------|
| | 296 | 331 | |
| HBX2 | NCTRPNNNTRKRIRIQRGPGRFAFVTIGK·IGNMRQAHCNISR | | |
| SHIV _{SF162P3} | NCTRPNNNTRKSIPI··GPGKAFYATGDIIGDIRQAHCNISG | | |
| Challenge stock | -----M----- | | 6/56 |
| | -----R----- | | 46/56 |
| | --I----- | | 2/56 |
| | -----M-----N----- | | 1/56 |
| | ----- | | 1/56 |
| C2 | -----H-----R----- | | 1/34 |
| Day 210 | -----H-----Q----- | | 26/34 |
| | -----T-----R----- | | 3/34 |
| | -----T-----R-----E----- | | 4/34 |
| | ----- | | 1/34 |
| C3 | -----H-----R----- | | 2/22 |
| Day 327 | -----S-----R----- | | 18/22 |
| | -----H-----R----- | | 2/22 |

Unpublished data

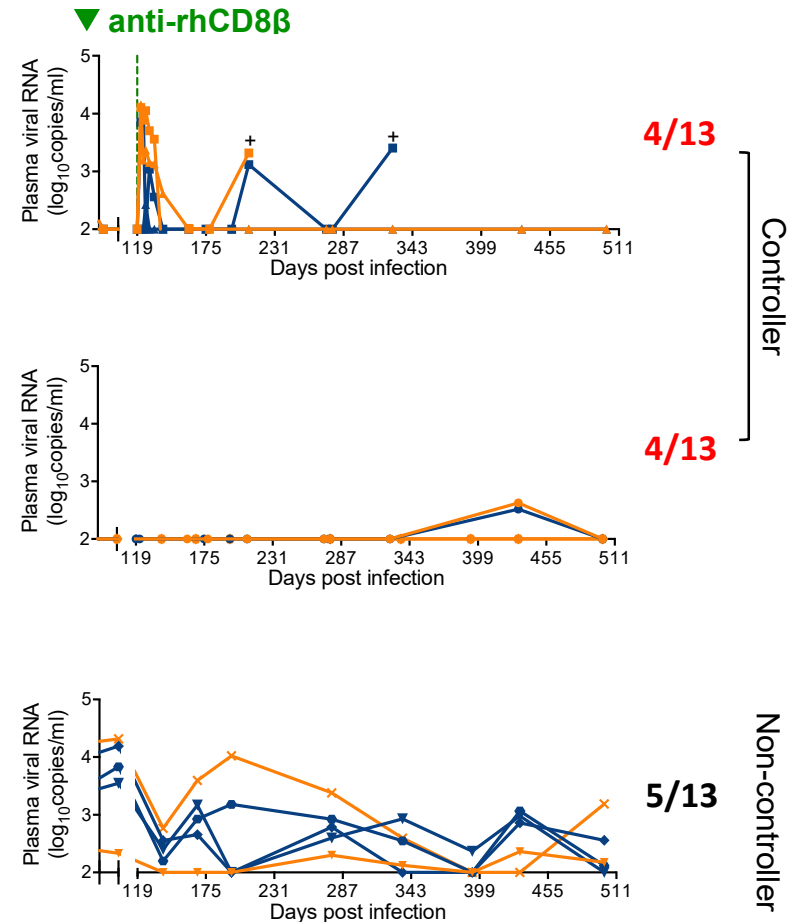
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Summary



- A single injection BiA-SG is sufficient to confer the full protection against high dose SHIV_{SF162P3} infection
- Early single dose of BiA-SG treatment
 - Prevents rapid disease progression and **deaths**
 - Converts lethal infection into sustained control (8/13 → 6/11)
 - Induce stronger humoral and cellular response
 - CD8⁺ T cell play a role in controlling viremia





Acknowledgement



HKU Med LKS Faculty of Medicine
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HKU-AIDS Institute Lab, Third People's Hospital, Shenzhen

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Thanks for your attention!

2019 HIV & HBV Cure Forum
Mexico City, Mexico

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