

Additional file 1: Sequence alignment of A4 DBL 3X (PDB code: 3BQK) and 3D7 DBL 3X domains. The disulfide linkages of A4 DBL 3X structure are colored in pairs. The cysteins forming disulfide linkages in 3D7 DBL 3X are predicted and are colored cyan.

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3D7-DBL3X 1209 SCDCSEPIYIRGCQPKIYDGKIFPGKGGEKQWICKDT-----IIHGDTNGACIPPRTQN
A4-DBL3X 1218 SCDLNATNYIRGCQSKTYDGKIFPGKGGEKQWICKDT-----IIHGDTNGACIPPRTQN
          : . * * . * . * . : * * * * * . : : : * : * * * * .

3D7-DBL3X          LCVGELWDKRYGGRSNIKNDTKESLKQKIKNAIQKETELLYEYHDKGTAIISRNPMKGQK
A4-DBL3X          LCVGELWDKSYGGRSNIKNDTKELLKEKIKNAIHKETELLYEYHDTGTAIISKNDKKGQK
          ** : * : * . . . . : ** : . * : : : : * : * : . . .

3D7-DBL3X          EKEEKNNDSNGLPKGFCHAVQRSFIDYKNMILGTSVNIYEYIGKLQEDIKKIIEKGTTKQ
A4-DBL3X          GK----NDPNGLPKGFCHAVQRSFIDYKNMILGTSVNIYEHIGKLQEDIKKIIEKGTPQQ
          * ** * * * : * * * : * * * : * * * : * : . * : : : * * : * :

3D7-DBL3X          NGKT--VGSGAEN-----VNAWWKGIEGEMWDAVRCAITKINKKQKNGTFSID-ECGI
A4-DBL3X          KDKIGGVSSTEN-----VNAWWKGIEREMWDAVRCAITKINKK--NNNSIFNGD-ECGV
          * . . . . : * * * : : * * * : . . . . : . . . .

3D7-DBL3X          FPPTGNDEDQSVSWFKWSEQFCIERLQYEKNIRDACTNNG-----QGDKIQG
A4-DBL3X          SPPTGNDEDQSVSWFKWGEQFCIERLRYEQNIREACTINGKNEKKCINSKSGQGDKIQG
          ** : * : : * * * * * : * . : : : * . . . :

3D7-DBL3X          DCKRKCEEYKKYI SEKKQEWDKQKTKYENKYVGK-----SAS
A4-DBL3X          ACKRKCEKYKKYI SEKKQEWDKQKTKYENKYVGK-----SAS
          ** . * * * * * * * : * : * : . . : : . *

3D7-DBL3X          DLLKENYPECISANFDFIFNDNIEYKTYYP-----YGDYSSIC
A4-DBL3X          DLLKENYPECISANFDFIFNDNIEYKTYYP-----YGDYSSIC
          . : * * : * * * * * : * * : * * * * * : * * :

3D7-DBL3X          SCEQVK----- 1559
A4-DBL3X          SCE----- 1577
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