## D88

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKA^GFNIK**DVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 1)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAATGG
ATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACCATG
ACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCTGTG
TATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCGTCT
(SEQ ID NO: 37)

^ denotes deletion of position S26

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## F38

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKA^GFNIK**DVYMS**WVRQAPGQGLEWMG**RIDPENGDTKYDPKLQG**RV
TMTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 80)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGGGCAAGGACTGGAATGG
ATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACCATG
ACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCTGTG
TATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCGTCT
(SEQ ID NO: 82)

^ denotes deletion of position S26

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSG
SGSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1A

## A48

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DTYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 16)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 39)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## C88

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 17)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 40)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1B

## F108

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DVYMS**WVRQAPGQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 81)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGGGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 83)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## B48

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKA^GFNIK**DTYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 18)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCGGCTTCAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAATGG
ATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACCATG
ACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCTGTG
TATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCGTCT
(SEQ ID NO: 41)

^ denotes deletion of position S26

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1C

## A68

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DTYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPK**□**LQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYC□R**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 19)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGTCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 42)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## A100

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DTYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPK**□**LQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYC**S**R**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 20)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTTCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 86)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1D

## C58

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASYWNIKDTYMSWVRQAPEQGLEWMGRIDPENGDTKYDPKLQGRVT
MTADTSTNTAYMELRSLRSDDTAVYYCARGWEGFAYWGQGTLVTVSS (SEQ ID NO: 21)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGTACTGGAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 43)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISCRASENVDKYGNSFMHWYQQKPGQPPKLLIYRASELQWGVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYCQRSNEVPWTFGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## C78

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIQDVYMSWVRQAPEQGLEWMGRIDPENGDTKYDPKLQGRVT
MTADTSTNTAYMELRSLRSDDTAVYYCARGWEGFAYWGQGTLVTVSS (SEQ ID NO: 23)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCCAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 44)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISCRASENVDKYGNSFMHWYQQKPGQPPKLLIYRASELQWGVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYCQRSNEVPWTFGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1E

## C68

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNI**SDVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 25)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCTCGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 45)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## D98

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKAS**A**FNIK**DTYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 27)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGCCTTCAATATCAAGGACACCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 46)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1F

## D188

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASAFNIK**DVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYCAR**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 29)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGCCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 87)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## C128

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYC**S**R**GWEGFAY**WGQGTLVTVSS (SEQ ID NO: 31)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTAGCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 88)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

Fig. 1G

## C98

VH amino acid and nucleotide sequence

QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DVYMS**WVRQAPEQGLEWMG**RIDPENGDTKYDPKLQG**RVT
MTADTSTNTAYMELRSLRSDDTAVYYC**VRGWEGFAY**WGQGTLVTVSS (SEQ ID NO: 32)

CAAGTGCAACTCGTTCAGTCCGGAGCAGAAGTCAAGAAACCTGGAGCTTCAGTCAAAGTCAGCTGCAAG
GCCTCGGGCTTCAATATCAAGGACGTCTACATGTCCTGGGTGCGGCAGGCTCCAGAGCAAGGACTGGAA
TGGATGGGGCGCATTGACCCGGAGAACGGTGATACGAAGTACGACCCGAAACTGCAGGGCCGCGTGACC
ATGACCGCAGATACTAGCACCAACACCGCGTACATGGAGCTGCGGTCCTTGAGGTCGGATGACACTGCT
GTGTATTACTGTGCCAGAGGCTGGGAAGGGTTCGCGTACTGGGGACAGGGAACTCTCGTGACTGTGTCG
TCT (SEQ ID NO: 89)

VL amino acid and nucleotide sequence

DIVMTQSPASLAVSLGERATISC**RASENVDKYGNSFMH**WYQQKPGQPPKLLIY**RASELQW**GVPDRFSGS
GSGTDFTLTISSLQAEDVAVYYC**QRSNEVPWT**FGQGTKLEIK (SEQ ID NO: 2)

GATATTGTCATGACCCAAAGCCCAGCCTCCCTCGCCGTGTCTCTCGGAGAAAGAGCAACTATCTCGTGC
CGGGCTTCGGAGAATGTGGACAAGTACGGCAACTCCTTCATGCACTGGTACCAGCAGAAACCGGGACAG
CCGCCTAAACTGTTGATCTACCGGGCGTCAGAACTGCAATGGGGAGTGCCTGACAGGTTTTCGGGTTCG
GGATCCGGCACGGATTTCACCCTCACTATCTCCAGCCTGCAAGCAGAGGACGTTGCGGTGTACTACTGT
CAGCGCTCAAACGAGGTCCCATGGACTTTTGGACAAGGGACCAAGCTGGAAATCAAG (SEQ ID NO: 38)

## A11 (mouse antibody)

VH amino acid and nucleotide sequence

QVKLLEQSGAELVKPGASVRLSCTASGFNIK**DTYMS**WVKQRPEQGLEWIG**RIDPENGDTKYDPKFQG**KA
TITADTSSNTAYLHLSSLTSGDTAVYYCSR**GWEGFAY**WGQGTLVTVSA (SEQ ID NO: 33)

CAAGTCAAACTGCTGGAACAGTCCGGAGCAGAGCTGGTGAAGCCTGGAGCGTCGGTGCGGCTTTCGTGT
ACCGCCTCCGGCTTTAACATCAAGGACACCTACATGTCGTGGGTGAAGCAGAGGCCCGAGCAGGGGCTC
GAATGGATTGGCCGCATCGACCCGGAAAATGGTGATACCAAATACGACCCAAAGTTCCAGGGAAAGGCC
ACTATCACTGCAGATACTTCAAGCAACACCGCCTACCTCCACCTGTCCTCGCTCACTTCCGGAGATACC
GCGGTCTACTATTGCTCAAGAGGATGGGAAGGCTTCGCGTACTGGGGTCAAGGAACGTTGGTGACCGTC
AGCGCC (SEQ ID NO: 47)

VL amino acid and nucleotide sequence

ELVMTQTPASLAVSLGQRATISC**RASENVDKYGNSFMH**WYQQKAGQPPKLLIY**RASELQW**GIPARFSGS
GSRTDFTLTINPVEADDVATYFC**QRSNEVPWT**FGGGTKLEIK (SEQ ID NO: 34)

GAATTGGTCATGACTCAGACGCCAGCTTCGCTGGCCGTGTCACTGGGACAGAGGGCCACTATCAGCTGC
AGAGCATCGGAGAATGTGGATAAGTACGGGAACAGCTTCATGCACTGGTATCAACAGAAAGCTGGTCAA
CCTCCGAAGCTGCTTATCTACCGGGCGTCGGAACTCCAATGGGGCATTCCAGCACGGTTCAGCGGGTCG
GGCTCCAGAACTGACTTCACCCTCACCATCAATCCCGTGGAGGCCGATGACGTGGCGACCTACTTTTGT
CAGCGCTCCAACGAGGTCCCGTGGACTTTCGGAGGAGGAACCAAGCTGGAAATCAAG (SEQ ID NO: 48)

Fig. 1H

## B11 (mouse antibody)

VH amino acid and nucleotide sequence

QVKLLEQSGAELVKPGASVRLSCTA^GFNIK**DTYMS**WVKQRPEQGLEWIG**RIDPENGDTKYDPKFQG**KA
TITADTSSNTAYLHLSSLTSGDTAVYYCSR**GWEGFAY**WGQGTLVTVSA (SEQ ID NO: 36)

CAAGTCAAACTGCTGGAACAGTCCGGAGCAGAGCTGGTGAAGCCTGGAGCGTCGGTGCGGCTTTCGTGT
ACCGCCGGCTTTAACATCAAGGACACCTACATGTCGTGGGTGAAGCAGAGGCCCGAGCAGGGGCTCGAA
TGGATTGGCCGCATCGACCCGGAAAATGGTGATACCAAATACGACCCAAAGTTCCAGGGAAAGGCCACT
ATCACTGCAGATACTTCAAGCAACACCGCCTACCTCCACCTGTCCTCGCTCACTTCCGGAGATACCGCG
GTCTACTATTGCTCAAGAGGATGGGAAGGCTTCGCGTACTGGGGTCAAGGAACGTTGGTGACCGTCAGC
GCC (SEQ ID NO: 49)

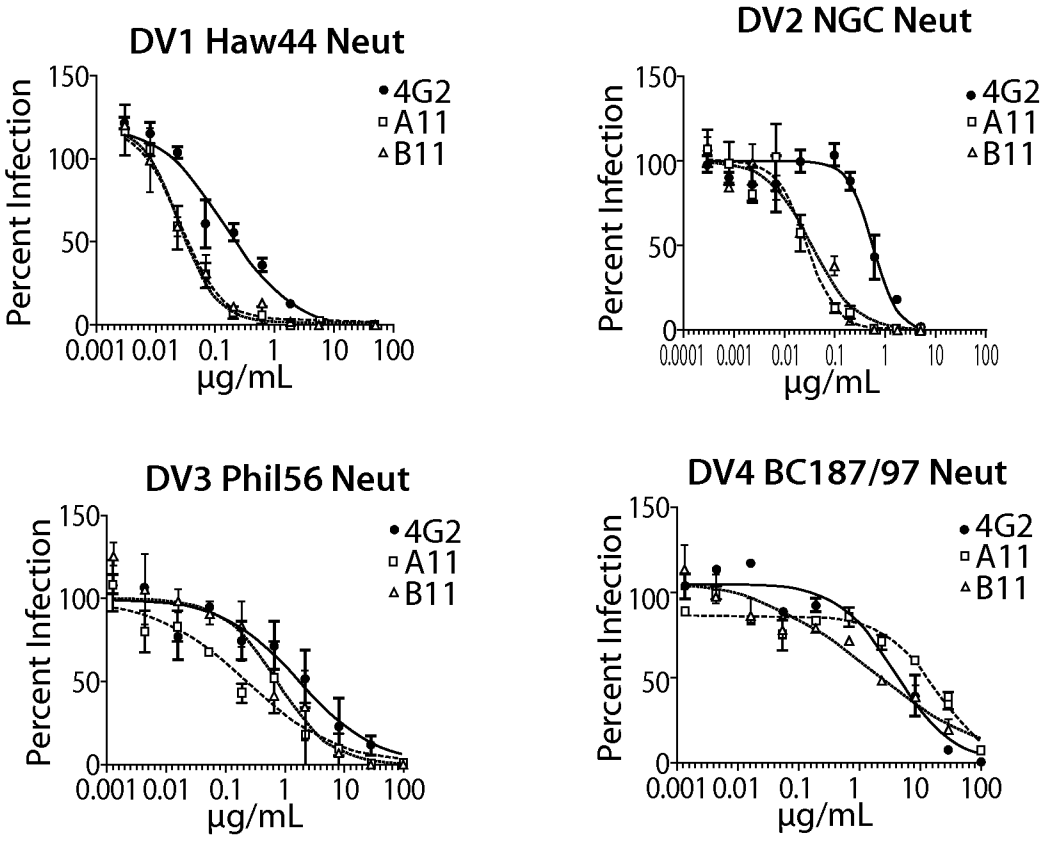
^ denotes deletion of position S26

VL amino acid and nucleotide sequence

ELVMTQTPASLAVSLGQRATISC**RASENVDKYGNSFMH**WYQQKAGQPPKLLIY**RASELQW**GIPARFSGS
GSRTDFTLTINPVEADDVATYFC**QRSNEVPWT**FGGGTKLEIK (SEQ ID NO: 34)

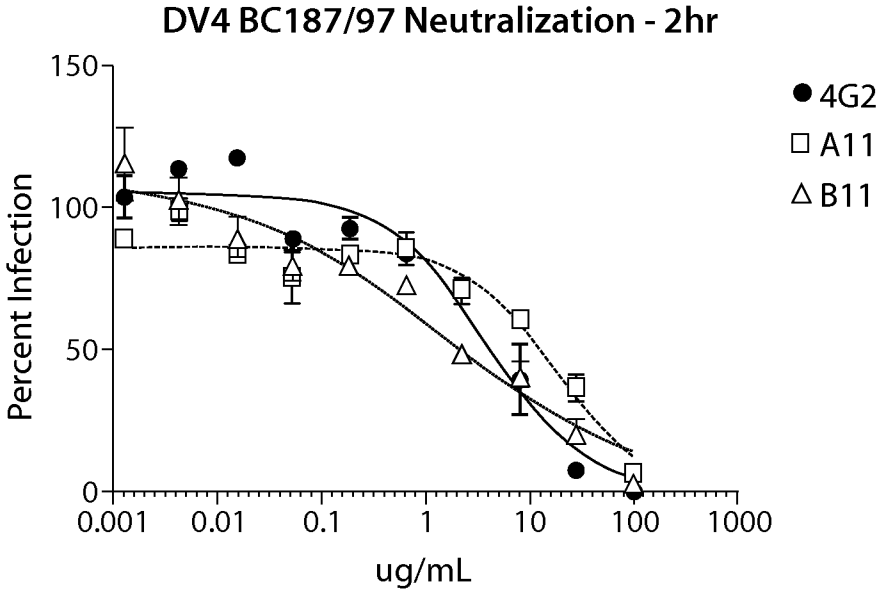
GAATTGGTCATGACTCAGACGCCAGCTTCGCTGGCCGTGTCACTGGGACAGAGGGCCACTATCAGCTGC
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CCTCCGAAGCTGCTTATCTACCGGGCGTCGGAACTCCAATGGGGCATTCCAGCACGGTTCAGCGGGTCG
GGCTCCAGAACTGACTTCACCCTCACCATCAATCCCGTGGAGGCCGATGACGTGGCGACCTACTTTTGT
CAGCGCTCCAACGAGGTCCCGTGGACTTTCGGAGGAGGAACCAAGCTGGAAATCAAG (SEQ ID NO: 48)

Fig. 1I




| | 4G2 $IC_{50}$ (µg/ml) | A11 $IC_{50}$ (µg/ml) | B11 $IC_{50}$ (µg/ml) |
|---|---|---|---|
| DV1 | .15 | 0.025 | 0.025 |
| DV2 | .57 | 0.028 | 0.035 |
| DV3 | 1.8 | .226 | .740 |
| DV4 | 3.2 – 3.9 | 4.0 – 17.6 | .50 – 1.4 |

Fig. 2




**Average # of palques – 42**

| | µg/mL | | |
|---|---|---|---|
| | **4G2** | **A11** | **B11** |
| **IC50 – 2hr** | 3.9 | 17.6 | 1.4 |

Fig. 3

| Antibody | Framework | EDIII-DV1 Kd (nM) | EDIII-DV2 Kd (nM) | EDIII-DV3 Kd (nM) | EDIII-DV4 Kd (nM) |
|---|---|---|---|---|---|
| A11 | Mouse | 0.269 | <0.1 | 18.03 | 89.71 |
| B11 | Mouse | <0.1 | <0.1 | 2.98 | 7.42 |
| A68 (A48 + A98V) | Human | <0.1 | <0.1 | 3 | 13.06 |
| A48 | Human | <0.1 | <0.1 | 5.8 | 52.20 |
| B48 + A98V | Human | <0.1 | <0.1 | 5.06 | 9.26 |
| B47 | Human | <0.1 | <0.1 | 7.29 | 20.15 |
| B48 (A48+del26) | Human | 0.123 | <0.1 | 8 | 27.61 |
| B28 – | Human | 0.134 | <0.1 | 9.29 | 37.77 |

Fig. 4

| | Heavy Chain | | | Light Chain | |
|---|---|---|---|---|---|
| mAb | FW | N-terminus changes | CDR mutations relative to A11 | Light Chain FW | EDIII-DV4 Kd (nM) |
| C88 (A48+T33V) | human (04) | -- | T33V | human (08) | 13 |
| C41 | Mouse | -- | T33V | Mouse | 2.56 |
| A48+V2L | human (04) | QLQLVQSG (SEQ ID NO: 95) (V2L) | T33V | human (08) | 21.34 |
| A48+InsE6 | human (04) | QVQLVEQSG (SEQ ID NO: 96) (E insertion) | T33V | human (08) | 19.51 |
| D38 | human (04) | QVKLVEQSG (SEQ ID NO: 97) (Q3K + E insertion) | T33V | human (08) | 12.88 |
| D48 | human (04) | QVKLLEQSG (SEQ ID NO: 98) (Q3K +V5L + E insertion) | T33V | human (08) | 7.494 |

| | Heavy Chain | | | Light Chain | |
|---|---|---|---|---|---|
| mAb | FW | N-terminus changes | FW1 mutations relative to A11 | Light Chain FW | EDIII-DV4 Kd (nM) |
| B48 | human (04) | -- | del26 | human (08) | 19.33 |
| B48+V2L | human (04) | QLQLVQSG (SEQ ID NO: 95) (V2L) | del26 | human (08) | 23.65 |
| B48+InsE6 | human (04) | QVQLVEQSG (SEQ ID NO: 96) (E insertion) | del26 | human (08) | 26.89 |

Fig. 5

| | Heavy Chain | Light Chain | |
|---|---|---|---|
| mAb name | CDR muts relative to A48 | Light Chain FW | EDIII-DV4 Kd (nM) |
| C88 | T33V | human (08) | 13 |
| D88 | Del26, T33V | human (08) | 3.115 |
| D98 | G27A, T33V | human (08) | 16.91 |
| D108 | G27Y, F28W, T33V | human (08) | 18.33 |
| D118 | F28W, T33V | human (08) | 12.61 |
| D128 | G27A, F28W, T33V | human (08) | 20.77 |
| D138 | G27Y, F28A, T33V | human (08) | 4156 |
| D148 | G27Y, T33V | human (08) | 17.99 |
| D158 | G27Y, F28G, T33V | human (08) | 1205 |
| D168 | F28Y, T33V | human (08) | 323.8 |

Fig. 6

| Ab name | Mutation relative to A48 | EDIII-DV3 Kd (nM) | EDIII-DV4 Kd (nM) |
|---|---|---|---|
| C88 | T33V | 0.97 | 23.78 |
| C98 | T33V, A98V | 1.21 | 10.51 |
| C128 | T33V, A98S | 0.63 | 18.7 |
| D88 | Del26+T33V | 1.05 | 5.01 |
| D178 | Del26+T33V+A98V | 1.05 | 4.67 |
| D188 | Del26+T33V+A98S | 1.06 | 5.92 |

Fig. 7

| MAb | EDIII-DV1 Kd (nM) | EDIII-DV2 Kd (nM) | EDIII-DV3 Kd (nM) | EDIII-DV4 Kd (nM) | EDIII-DV4 [1/7] Kd (nM) |
|---|---|---|---|---|---|
| C88 (A48+T33V) | <0.1 | <0.1 | 1.06 | 15.37 | 13.00 |
| D88 (A48+T33V+ del26) | <0.1 | <0.1 | 1.21 | 6.12 | 3.12 |
| C98 (A48+T33V+ A98V) | <0.1 | <0.1 | 1.29 | 8.94 | 6.70 |
| D118 (A48+F28W+ T33V) | <0.1 | <0.1 | 9.07 | 24.35 | 12.61 |
| A11 (Assay #1) | 0.35 | 0.11 | 16.83 | 110.00 | 56.30 |
| A11 (Assay #2) | 0.269 | <0.1 | 18.03 | 89.71 | |

Fig. 8

| MAb | EDIII-DV1 Kd (nM) | EDIII-DV2 Kd (nM) | EDIII-DV3 Kd (nM) | EDIII-DV4 Kd (nM) |
|---|---|---|---|---|
| C88 (A48+T33V) | 2.83E-11 | 1.32E-11 | 5.56E-10 | 1.45E-08 |
| D88 (A48+T33V+del26) | 4.81E-11 | 3.02E-11 | 6.58E-10 | 2.79E-09 |
| C98 (A48+T33V+A98V) | 1.07E-10 | 3.24E-11 | 8.62E-10 | 6.60E-09 |
| B11 | | | | 9.65E-09 |
| A11 | | | | 5.03E-08 |

Fig. 9

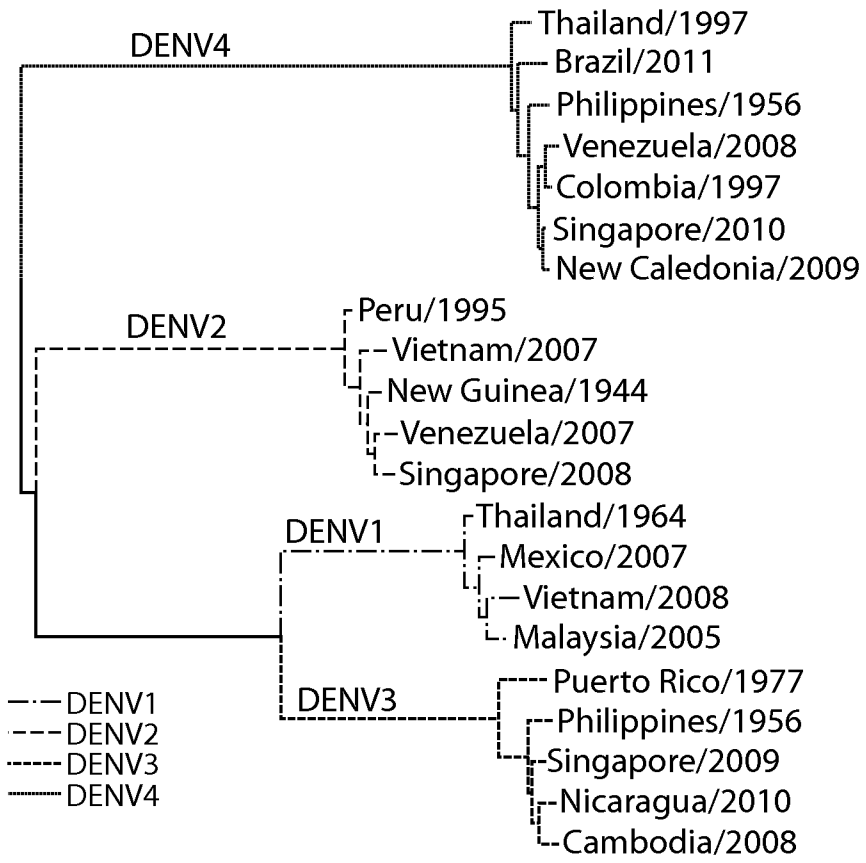

DENV4
Thailand/1997
Brazil/2011
Philippines/1956
Venezuela/2008
Colombia/1997
Singapore/2010
New Caledonia/2009
DENV2
Peru/1995
Vietnam/2007
New Guinea/1944
Venezuela/2007
Singapore/2008
DENV1
Thailand/1964
Mexico/2007
Vietnam/2008
Malaysia/2005
DENV3
Puerto Rico/1977
Philippines/1956
Singapore/2009
Nicaragua/2010
Cambodia/2008
DENV1
DENV2
DENV3
DENV4

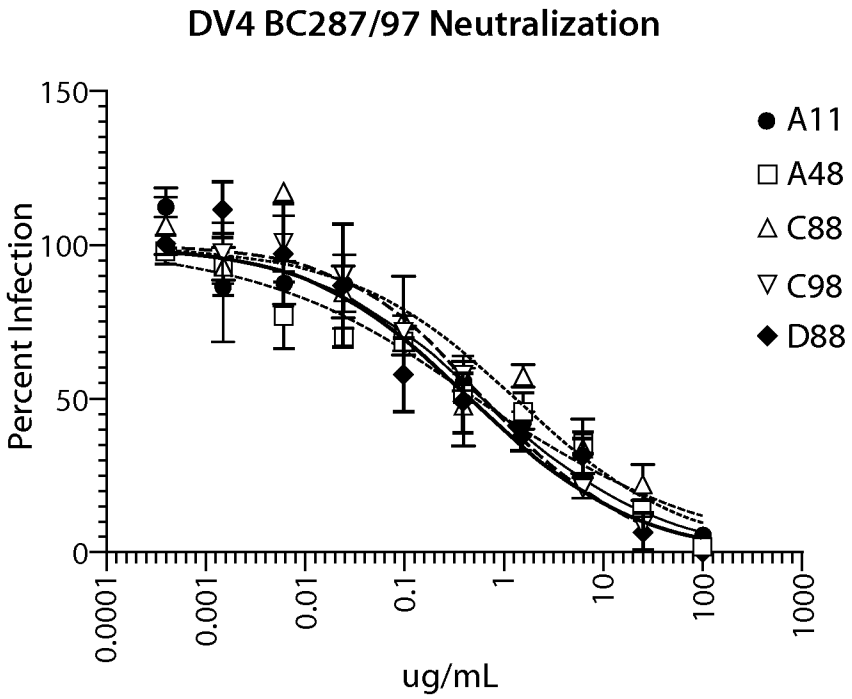
Fig. 10A

| Serotype | EDIII strain | Genotype | $K_D$ by ELISA (nM) | $K_D$ by SPR (nM) |
|---|---|---|---|---|
| I | Hawaii/1944* | I | <0.1 | 0.041 |
| | Vietnam/2008 | I | <0.1 | 0.031 |
| | Malaysia/2005 | IV | <0.1 | 0.064 |
| | Mexico/2007 | V | <0.1 | 0.071 |
| II | New Guinea/1944 (NGC)* | Asian I | <0.1 | 0.016 |
| | Singapore/2008 | Cosmopolitan | <0.1 | 0.024 |
| | Peru/1995 | American | <0.1 | 0.012 |
| | Vietnam/2007 | Asian II | <0.1 | 0.014 |
| | Venezuela/2007 | SE-Asian/American | <0.1 | 0.029 |
| III | Philippines/1956 (H87)* | I | 1.24 | 1.00 |
| | Singapore/2009 | I | 0.35 | 0.61 |
| | Nicaragua/2010 | III | 3.36 | 4.91 |
| | Puerto Rico/1977 | IV | 1.36 | 1.40 |
| | Cambodia/2008 | II | 1.32 | 2.47 |
| IV | Mexico/1977 (BC287/97)* | IIa | 4.32 | 3.8 |
| | Singapore/2010 | IIb | 8.43 | 6.1 |
| | New Caledonia/2009 | IIb | 10.81 | 8.9 |
| | Philippines/1956 (H241)* | I | 113.10 | 118.5 |
| | Brazil/2011 | I | 14.68 | 7.9 |
| | Venezuela/2008 | IIa | 4.50 | 3.03 |
| | Thailand/1997 | III | 611.60 | >300 |

Fig. 10B

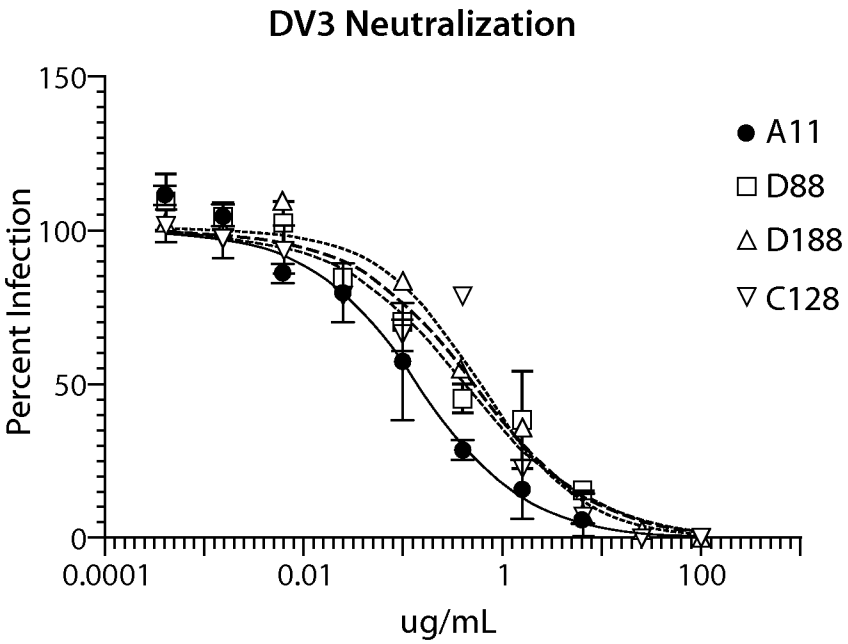
| | | *Antibody Construct Kd (nM)* | | | | | |
|---|---|---|---|---|---|---|---|
| | *Ag* | 4E11 | A11 | A88 | B88 | C88 | D88 |
| **DENV-4** | BC2 | 40,793 | 86.2 | 22.5 | 17.3 | 10.6 | 7.2 |
| | Sing | | 136.3 | 34.1 | 24.6 | 15 | 8.4 |
| | NC | | 201.6 | 24.3 | 37.1 | 11.3 | 10.8 |
| | Phil | | 5075 | 415.4 | 491.1 | 234 | 148 |
| **DENV-3** | Sing | | 7.5 | 3 | 3.1 | 1 | 0.33 |
| | Nic | | 32.1 | 13.7 | 23.3 | 3.2 | 3.3 |
| | H87 | 21.8 | 14.1 | 5.5 | 7.9 | 1.5 | 1.2 |
| **DENV-2** | Peru | | 0.39 | 0.49 | 0.42 | 0.38 | < 0.1 |
| | Sing | | <0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| | NGC | 5.2 | <0.1 | < 0.1 | 0.14 | < 0.1 | < 0.1 |

Fig. 11



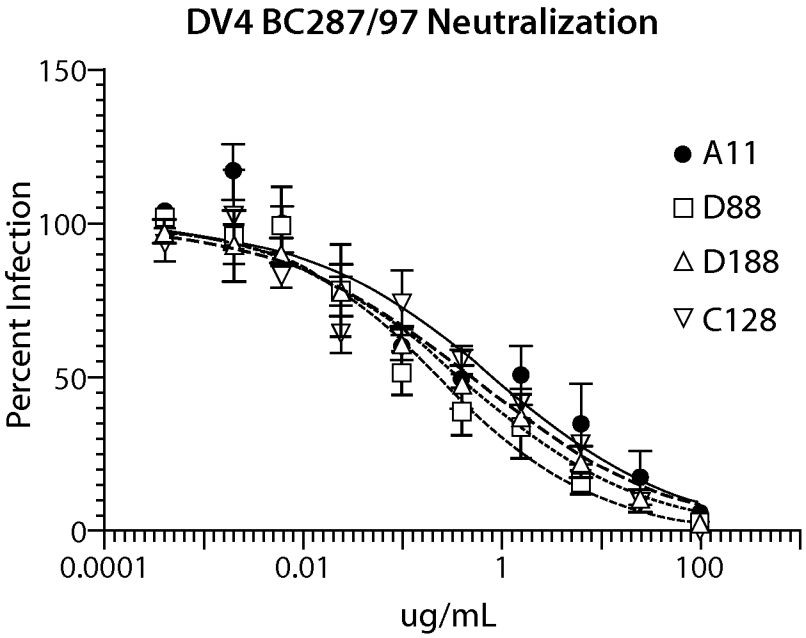

| mAb | $EC_{50}$ [ng/mL] |
|---|---|
| A11 | 650 |
| A48 | 554 |
| C88 (A48+T33V) | 1,319 |
| C98 (A48+T33V+A98V) | 638 |
| D88 (A48+T33V+del26) | 461 |

Fig. 12




| Antibody | Description | $EC_{50}$ (ng/ml) |
|---|---|---|
| A11 | mouse | 300-500 |
| D88 | Del26+T33V | 426 |
| D188 | Del26+T33V+98S | 586 |
| C128 | T33V+98S | 506 |

Fig. 13




| Antibody | Description | $EC_{50}$ (ng/ml) |
|---|---|---|
| A11 | | 791 |
| D88 | Del26+T33V | 239 |
| D188 | Del26+T33V+A98S | 383 |
| C128 | T33V+A98S | 501 |

Fig. 14

| Antibody name | Heavy chain description | Light chain description | $T_m$ (°C) |
|---|---|---|---|
| C51/mouse | A48+G27Y+F28W | Mouse (A11) | 65.7 |
| C61/mouse | A48+K31S+T33V | Mouse (A11) | 67.5 |
| C71/mouse | A48+K31Q+T33V | Mouse A11) | 66.8 |
| C81/mouse | A48+T33V | Mouse (A11) | 67.4 |
| C58 | A48+G27Y+F28W | Human (A48) | 64.1 |
| C68 | A48+K31S+T33V | Human (A48) | 66.8 |
| C78 | A48+K31Q+T33V | Human (A48) | 66.3 |
| C88 | A48+T33V | Human (A48) | 66.4 |
| A11 | mouse | mouse | 64.8 |
| B11 | mouse | mouse | 62.7 |
| Trastuzumab | | | 69.1 |

Fig. 15A

| Sample | A48 | A68 (A48+ A98V) | B48 | B48+ A98V | A48+ del26+ L64F | A48+ del26 T33V+L 64F | A48+ T33V +del26 | A48+ L64F | A48+ T33V |
|---|---|---|---|---|---|---|---|---|---|
| Tm | 66.3 | 62.5 | 64.1 | 58.3 | 65.7 | 62.5 | 61.9 | 67.4 | 66.4 |

Fig. 15B

| Sample | A48 | A68 (A48+ A98V) | B48 | B48+ A98V | A48+ del26+ L64F | A48+ del26 T33V+L 64F | A48+ T33V +del26 | A48+ L64F | A48+ T33V |
|---|---|---|---|---|---|---|---|---|---|
| Tm | 66.3 | 62.5 | 64.1 | 58.3 | 65.7 | 62.5 | 61.9 | 67.4 | 66.4 |

Fig. 15C

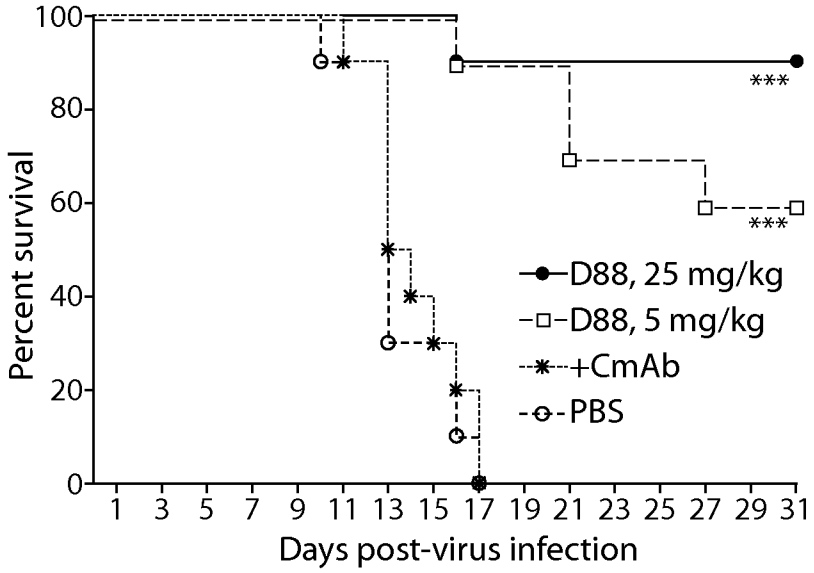

100
80
60
40
20
0
Percent survival
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Days post-virus infection
***
***
D88, 25 mg/kg
D88, 5 mg/kg
+CmAb
PBS

Fig. 16

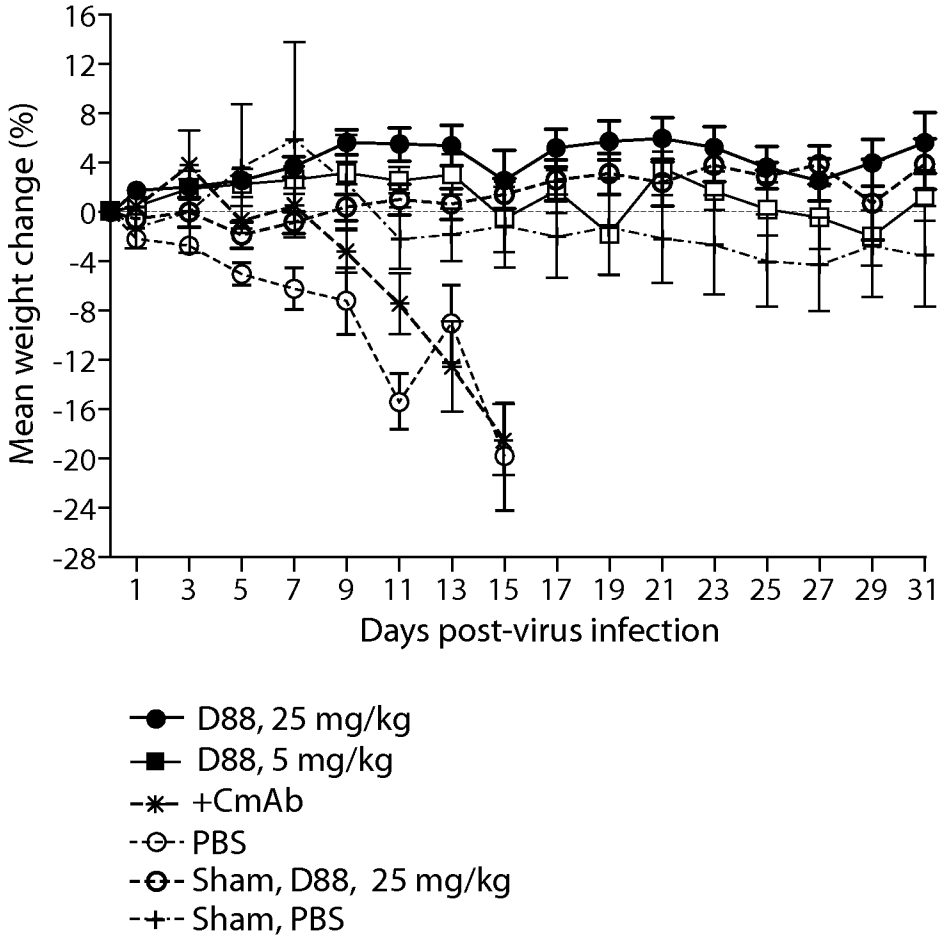

16
12
8
4
0
-4
-8
-12
-16
-20
-24
-28
Mean weight change (%)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Days post-virus infection
D88, 25 mg/kg
D88, 5 mg/kg
+CmAb
PBS
Sham, D88, 25 mg/kg
Sham, PBS

Fig. 17

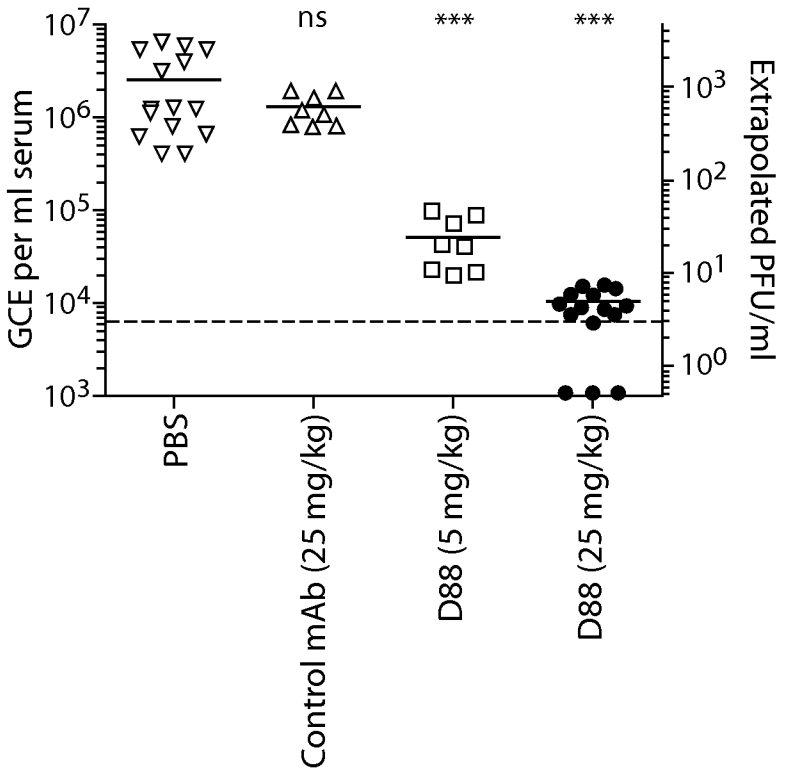
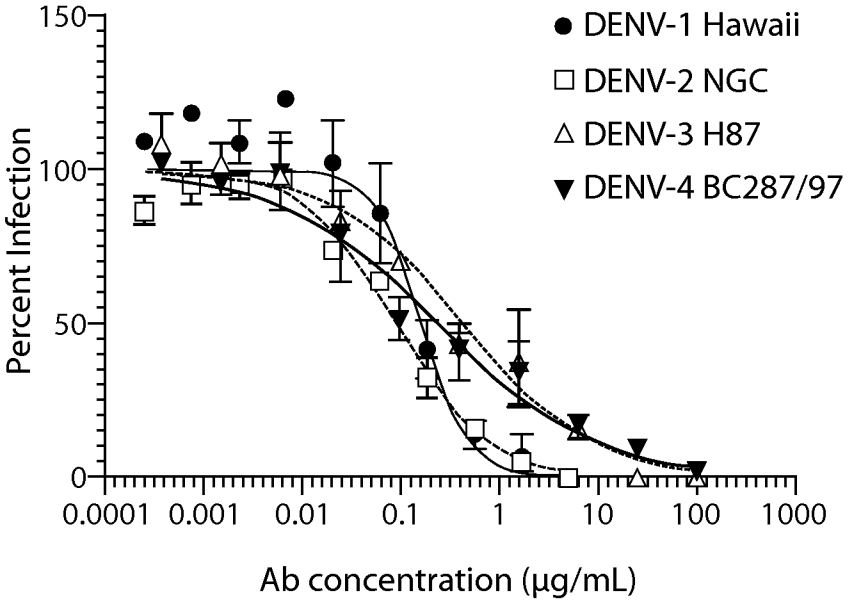

ns
***
***
$10^7$
$10^6$
$10^5$
$10^4$
$10^3$
GCE per ml serum
$10^3$
$10^2$
$10^1$
$10^0$
Extrapolated PFU/ml
PBS
Control mAb (25 mg/kg)
D88 (5 mg/kg)
D88 (25 mg/kg)

Fig.18

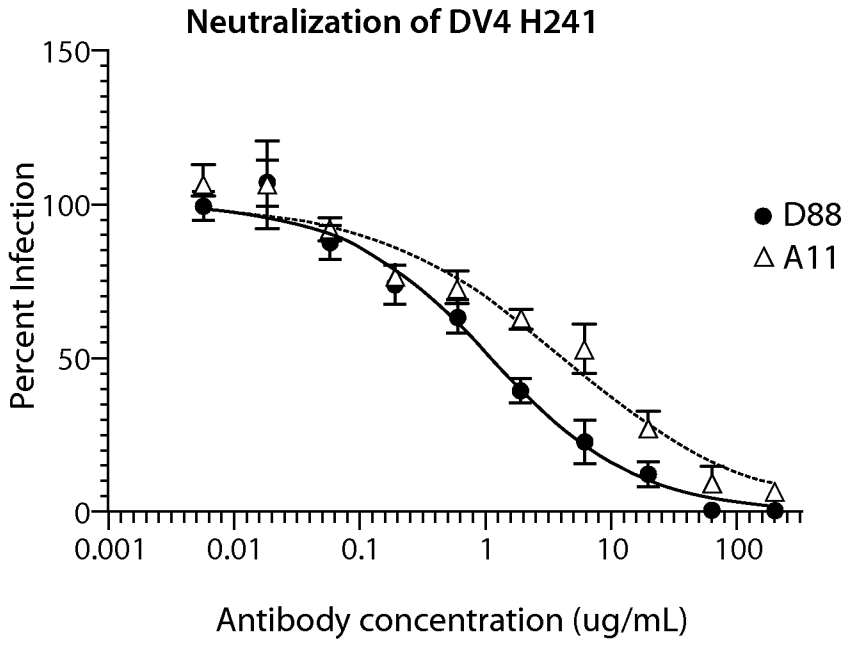



| Virus | Strain | Ab $EC_{50}$ [ng/mL] |
|---|---|---|
| DENV-1 | Hawaii/1944 | 309 ± 82 |
| DENV-2 | New Guinea/1944 (NGC) | 77 ± 15 |
| DENV-3 | Philippines/1956 (H87) | 359 ± 34 |
| DENV-4 | Mexico/1997 (BC287/97) | 291 ± 63 |

Fig. 19

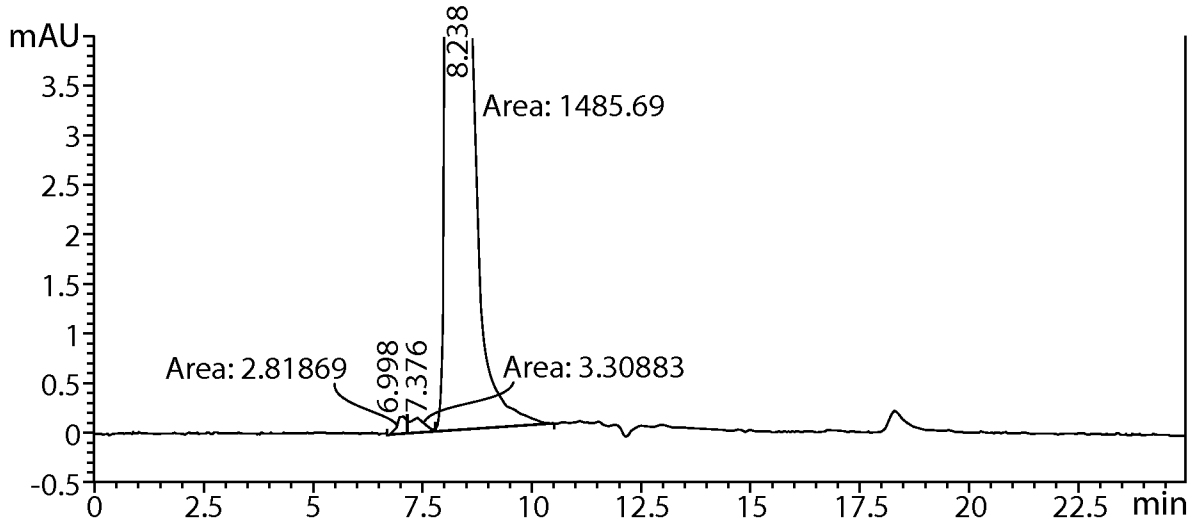
| | DENV-1 (Hawaii/1944) $FRNT_{50}$ (ng/ml) | DENV-2 (New Guinea/1944; NGC) $FRNT_{50}$ (ng/ml) | DENV-3 (Philippines/1956; H87) $FRNT_{50}$ (ng/ml) | DENV-4 (Mexico/1997; BC287/97) $FRNT_{50}$ (ng/ml) |
|---|---|---|---|---|
| Ab | 449 | 48 | 338 | 417 |

Fig. 20




| Antibody | $EC_{50}$ [ng/mL] |
|---|---|
| D88 | 1,074 |
| A11 | 4,093 |

Fig. 21




| | Retention Time (min) | % Monomer |
|---|---|---|
| **A48** | 8.246 | 99.15 |
| **C88** | 8.225 | 98.37 |
| **D88** | 8.238 | 99.59 |

Fig. 22

| | 4E11 | D88 | Fold Enhancement |
|---|---|---|---|
| DENV-1 EDIII $K_D$ (nM) | 0.33 | 0.041 | **8** |
| DENV-2 EDIII $K_D$ (nM) | 5.20 | 0.016 | **325** |
| DENV-3 EDIII $K_D$ (nM) | 21.8 | 1.00 | **22** |
| DENV-4 EDIII $K_D$ (nM) | 40,800 | 3.80 | **10,700** |

Fig. 23