Sequences of the Lym-1 antibody heavy and light chain variable regions

Arthur A. Wellman and Claude F. Meares*

Department of Chemistry, University of California, Davis, CA 95616, USA

Submitted August 1, 1990

EMBL accession nos X53483, X53484

Lym-1 is a murine IgG_{2a} antibody used in cancer therapy (1, 2). The sequences of the mRNA encoding the variable regions were determined by the method of Hamlyn *et al.* (3). In each case, a DNA primer complementary to the 5' portion of the constant region was used initially, and subsequent primers were custom synthesized. Of interest is the mutation (C for G) at nucleic acid residue 387, indicated by an asterisk Figure 1. This results in a histidine residue at that highly conserved position in the fourth heavy chain framework region, instead of the glutamine found in other antibodies of this subgroup (IB). The deduced amino acid sequence of the light chain was verified by peptide sequencing the first 22 residues (Figure 2); this could not be done for the heavy chain due to blockage of the amino terminus.

ACKNOWLEDGEMENTS

We gratefully acknowledge Techniclone International, Santa Ana, CA, USA for their generous gift of material and D. Sally J. DeNardo and A. Gregory Matera for helpful discussions. This work was supported by a grant from the National Cancer Institute (CA 47829, G.L. DeNardo, P.I.).

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1  AUG GCU GUC CUG GGG CUG CUU CUC UGC CUG GUG ACU UUC CCA AGC UGU GUC CUG UCC CAG → 60
   Met Ala Val Leu Gly Leu Leu Leu Cys Leu Val Thr Phe Pro Ser Cys Val Leu Ser Gln
21  GUG CAG CUG AAG GAG UCA GGA CCU GGC CUG GUG GCG CCC UCA CAG AGC UGC UCC AUC ACA 120
   Val Gln Leu Lys Gly Ser Gly Pro Gly Leu Val Ala Pro Ser Gln Ser Leu Ser Ile Thr
41  UGC ACC AUC UCA GGG UUC UCA UUA ACC AGC UAU GGU GUA CAC UGG GUU CGC CAG CCU CCA 180
   Cys Thr Ile Ser Gly Phe Ser Leu Thr Ser Tyr Gly Val His Trp Val Arg Gln Pro Pro
61  GGA AAG GGU CUG GAG UGG CUG GUA GUG AUA UGG AGU GAU GGA AGC ACA ACC UAU AAU UCA 240
   Gly Lys Gly Leu Glu Trp Leu Val Val Ile Trp Ser Asp Gly Ser Thr Thr Tyr Asn Ser
81  GCU CUC AAA UCC AGA CUG AGC AUC AGC AAG GAC AAC UCC AAG AGC CAA GUU UUC UUA AAA 300
   Ala Leu Lys Ser Arg Leu Ser Ile Ser Lys Asp Asn Ser Lys Ser Gln Val Phe Leu Lys
101 AUG AAC AGU CUC CAA ACU GAU GAC ACA GCC AUA UAC UAG UGU GCC AGU CAC UAC GGU AGU 360
   Met Asn Ser Leu Gln Thr Asp Asp Thr Ala Ile Tyr Tyr Cys Ala Ser His Tyr Gly Ser
121 ACC CUU GCC UUU GCU UCC UGG GGC CAC GGG ACU CUG GUC ACU GUC UCU GCA GCC AAA ACA 420
   Thr Leu Ala Phe Ala Ser Trp Gly His Gly Thr Leu Val Thr Val Ser Ala Ala Lys Thr
ACA GCC CCA UCG
141 Thr Ala Pro Ser
432

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Figure 1. The Lym-1 heavy chain variable region and leader peptide, with a portion of the constant region. (→) The amino terminus of the antibody (⇒) The beginning of the constant region. The hypervariable loops are double underlined.

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GCAUCACACUGAAACACACAGAC 24
1  AUG AGU GUG CCC ACU CAG GUC CUG GGG UUG CUG CUG UGG CUU ACA GUA GGU GUC AGA 84
   Met Ser Val Pro Thr Gln Val Leu Gly Leu Leu Leu Leu Trp Leu Thr Val Gly Val Arg
21  UGU GAC AUC CAG AUG ACU CAG UCU CCA GCC UCC CUA UCU GCA UCU GUG GGA GAA ACU GUC 144
   Cys Asp Ile Gln Met Thr Gln Ser Pro Ala Ser Leu Ser Ala Ser Val Gly Gly Thr Val
41  ACC AUC AUA UGU CGA GCA AGU GUG AAU AUU UAC AGU UAU UUA GCA UGG UAU CAG CAG AAA 204
   Thr Ile Ile Cys Arg Ala Ser Val Asn Ile Tyr Ser Tyr Leu Ala Trp Tyr Gln Lys Lys
61  CAG GGA AAA UCU CCU CAG CUC CUA GUC UAU AAU GCC AAA AUC UUA GCA GAA GGU GUG CCA 264
   Gln Gly Lys Ser Pro Gln Leu Leu Val Tyr Asn Ala Lys Ile Leu Ala Glu Gly Val Pro
81  UCA AGG UUC AGU GGC AGU GGA UCA GGC ACA CAG UUU UCU CUG AAG AUC AAC AGC CUG CAG 324
   Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Gln Phe Ser Leu Lys Ile Asn Ser Leu Gln
101 CCU GAA GAU UUU GGG AGU UAU UAC UGU CAA CAU CAU UAU GGU CCA UUC ACG UUC GGC UCG 384
   Pro Glu Asp Phe Gly Ser Tyr Tyr Cys Gln His His Tyr Gly Pro Phe Thr Phe Gly Ser
121 GGG ACA AAG UUG GAA AUA AAA CGG GCU GAU GCU CCA ACA ACU 426
   Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Pro Thr

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Figure 2. The Lym-1 light chain variable region and leader peptide, with portions of the 5' noncoding and constant regions. The portion confirmed by direct protein sequencing is underlined.

* To whom correspondence should be addressed