Nucleotide sequences of immunoglobulin heavy and light chain V-regions from a monoclonal autoantibody specific for a unique set of small nuclear ribonucleoprotein complexes

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The murine monoclonal autoantibody F78 recognizes a unique epitope present on small nuclear ribonucleoprotein (snRNP) complexes (1). The epitope recognized by this murine autoantibody is distinct from Sm or RNP epitopes (1–3). F78 is a unique tool for characterization of snRNPs because of the distinct nature of the snRNP complex it recognizes. Immunoprecipitation studies have revealed that this antibody recognizes a heat-labile complex of 180–200 kDa which contains the B', B, D, E, F and G snRNP but which lacks the U1-associated 70 kDa, A and C polypeptides. Thus, it appears that F78 may recognize a unique spliceosome complex (1–3).

Immunoglobulin genes were isolated using PCR and a series of primers specific for the V-region of either the mouse immunoglobulin gamma or kappa chains, respectively (4). PCR-amplified DNA was directly sequenced as described (5–7).

Deduced amino acid sequences for the F78 monoclonal autoantibody immunoglobulin gamma heavy chain and kappa light chain are shown in Figure 1. Homology comparisons of F78 to other murine immunoglobulin genes is shown in Figure 1. Variable region nucleotide sequences of F78 revealed that the gamma 2a heavy chain is a member of the immunoglobulin V_HIIA Subgroup, V_HJ558 Family; while the kappa light chain is a member of the K_VV Family (8). Analysis for homology with other known sequences revealed that both the heavy and light chains exhibited significant sequence homology to previously reported immunoglobulin heavy and light chain genes from murine hybridoma AN11, generated against spin-labeled dinitrophenol haptens (9). The F78 immunoglobulin heavy chain gene also exhibited significant homology to the heavy chain gene from murine hybridoma BMA031, specific for the human T cell receptor (10). The F78 immunoglobulin light chain exhibited significant homology to AN11 and to the light chain gene from a murine hybridoma specific for creatinine kinase, MAK33, as well as to several non-functionally rearranged kappa light chain transcripts (11). Despite these homologies, analysis of the immunoglobulin complementarity determining regions 1–3 (CDR1, CDR2 and CDR3) showed numerous differences from previously reported murine immunoglobulin gene sequences.

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Figure 1. Alignment of deduced amino acid sequences of immunoglobulin heavy (a) and light (b) chain V-regions from monoclonal autoantibody F78 compared to immunoglobulin gene sequences from murine monoclonal antibody producing hybridomas AN11, BMA031 (a) and MAK33 (b) (9–11). Numbering used is after Kabat et al. (8). Signal peptide and complementarity determining regions 1–3 (CDR1, CDR2 and CDR3) are as indicated.