c when exogenous ligand concentration is high.

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Modern atmospheric environmental records in Guliya Ice Cap of Qinghai-Xizang Plateau

Carrying dry and wet deposition records of aerosols in the mid- to upper-troposphere above northwestern Qinghai-Xizang Plateau, the Guliya Ice Core extracted in 1992 at the elevation of 6 400 m on Guliya Ice Cap of western Kunlun Mt.[1] has provided a unique opportunity to improve our understanding of atmospheric emvironment in this area. On the basis of studies on firn-ice transition of the ice cap, depositional processes of constituents in the ice cap and ice core physics, we have ascertained the formation mechanisms and seasons of the major characteristic layers in the ice core. The dust period layers (dirty layers) are mainly formed in February—May, when dust storms are most frequent in western China (because of the insufficiency and rapid setting of meltwater at drilling site even in summer, there are few chances for the formation of the late summer dirty layers), the low dust period layers (clear ice layers) are formed in middle summer, a low dust burden period in the atmosphere over the plateau. Besides, the other layers are white ice rich in air bubbles. According to the result of dating from dirty layers, the upper 5-m section of the Guliya Ice Core represents the net accumulation of precipitations for the years from 1977 to 1992. Based on the concentration data set of major ions (Na^+, Ca^{2+}, Mg^{2+}, Cl^-, SO_4^{2-} and NO_3^-) in the dissolved characteristic layers of the section, the aerosol records within it are recovered. The following conclusions can be drawn.

1) Strong correlations appear among the depth profiles of the concentrations of all

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ions, which exhibit striking cyclical fluctuations (fig. 1, for anion curves only). The mean concentrations of the six ions in dust period layers are 4—8 times higher than those in low dust period layers respectively, which means that there is a significant seasonal variation in the environment of northwestern part of the Qinghai-Xizang Plateau. In the low dust period layers, the concentrations of SO_4^{2-} and NO_3^- are 1.6 and 1.3 μmol • kg^{-1} respectively, showing similarities to the "backgrounds" of SO_4^{2-} and NO_3^- in most remote snow or ice covers in the world, while the concentrations of cations are somewhat higher. Our calculations indicate that 76% and 66% of the total SO_4^{2-} and NO_3^- contents in the 5-m ice core can be attributed to the influx of suspended dust during dust seasons.

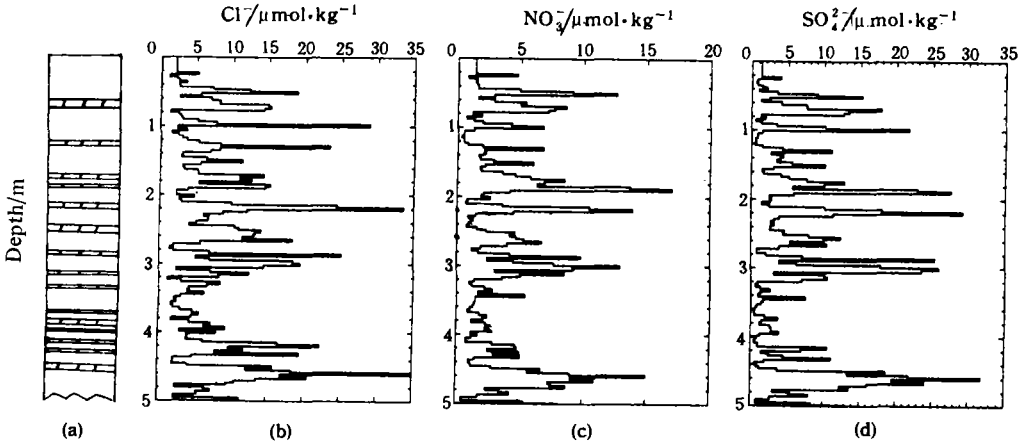

Fig. 1. (a) 5-m section of Guliya Ice Core, with the bands representing dirty layers; (b)—(d) change curves of anion concentration with depth.

2) Mean concentrations of three cations, Na^+, Ca^{2+} and Mg^{2+}, are 17.6, 47.6 and 11.6 μmol • kg^{-1} respectively, and those of three anions, Cl^-, SO_4^{2-} and NO_3^-, are 8.1, 6.4 and 3.8 μmol • kg^{-1} respectively. These values are much higher than those in snow and ice covers of polar regions and other remote areas of the world, indicating that the total aerosol burden in the atmosphere above northwestern Qinghai-Xizang Plateau occupies the first place in remote snow-ice areas of the world. The annual depositions of SO_4^{2-} and NO_3^- on the Guliya Ice Cap are 83.0 and 74.4 nmol • cm^{-2} • a^{-1} respectively, 10 times higher than those in the Antarctic ice sheet and much higher than those in the Greenland ice sheet[2] or the glaciers on the southern part of the Qinghai-Xizang Plateau.

3) Mean concentration of SO_4^{2-} is 1/3 and 1/9 of that in Glacier No. 1 and Begeda peak glacier in the Tianshan Mt. respectively[3], which have been found affected by anthropogenic gases; it is 1/100 of that in the perennial precipitations in the cities which have being heavily affected by anthropogenic gases, such as Beijing and Guiyang. Furthermore, the SO_4^{2-} and NO_3^- in the Guliya Ice Core basically came from soil- or desert-derived dust, and their concentrations do not show increasing trends after the

industrialization. Therefore, we believe that anthropogenic gases have little effect on the atmosphere over the northwestern Qinghai-Xizang Plateau.

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V gene usage of five monoclonal natural autoantibodies*

An increasing amount of evidence indicates that there exists a pool of autoantibodies in the serum of normal animals and humans[1]. Characterized by low affinity and polyreactivity, they are termed natural autoantibody, or NAA, to be distinguishable from pathologically occurring autoantibodies. The existence and discovery of NAA render a challenge to the traditionally accepted point of view that autoantibodies are harmful, and impose a new subject on modern immunology. The biogenesis and physiological significance of NAA are currently unclear.

We have produced a body of hybridoma cells through cell fusion of myeoloma cells with splenocytes from normal unimmunized young BALB/c mice. Using phosphatitylserine as autoantigen for screening and subcloning, five cell clones, i.e. KI-3, IB-3, SG-4, IF-5 and IH-8, were established, all secreting monoclonal NAA reactive to phosphatitylserine, with KI-3 being IgG and the other IgM. Western blotting analysis employing mouse liver whole proteins as antigens was carried out to test the polyreactivities of the five antibodies. The result showed that they all could recognize more than three protein bands with molecular weights ranging from 20 to 100 ku. Three patterns of polyreactivity were identified based on the number and position of the bands recognized: KI-3, IB-3 and IF-5 were attributed to one pattern (I), for they were similar in both aspects; SG-4 formed another pattern

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