

- 24 **The scid factor on human chromosome 8 restores both V(D)J recombination and double-strand break repair**
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The murine severe combined immune deficiency mutation (scid) is characterized by a lack of both B and T cells, due to a defect in lymphoid V(D)J recombination. Recently, the putative human homologue of the murine scid gene, HYRC1, was assigned to human chromosome 8q11, based on the radiation sensitivity of scid. In the present study, we demonstrated that HYRC1 encodes the scid factor which is involved in both V(D)J recombination and in a substantial fraction of repair from radiation-induced DNA double strand breaks.

- 25 **Isolation of full length cDNA which has ability to complement the SCID (Severe Combined Immune deficiency) mouse mutation**

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SCID mouse exhibits two phenotypic abnormalities: high sensitivity to radiation and abnormal V(D)J recombination. In order to isolate the cDNA complementing SCID mutation, 1.2×10^5 neomycin resistant transfectants were X-irradiated. As a result, three radioresistant cell lines were obtained. Two of the three recovered cDNA were identical. By transfecting the recovered cDNA clones into SCID mouse fibroblast cell line, we confirmed that the neo-transformed cells were radioresistant, indicating that the obtained cDNA is a gene involved in DNA repair. Since Northern blot analysis indicates that the cDNA so far obtained is truncated, we are making attempts to isolate full length cDNA using RACE method.

- 26 **Analysis of V(D)J recombination in lymphoid tissue of the SCID mice**

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SCID mutation has been considered as the mutation of V(D)J recombinase components. However, we obtained the abnormal V(D)J recombination products from the normal mouse cell lines as well as the SCID mouse. Therefore, we tested whether the V(D)J recombination in lymphoid tissue of the SCID mice is normal or abnormal using extrachromosomal vectors which have V(D)J recombination signals. As a result, we could obtain the V(D)J recombination products directly from lymphoid tissues and the activity ratio of each lymphoid tissue was thymus:bone marrow:spleen:lymph node = 6.87:20:3.17:1. We are now analyzing the structure of the obtained recombined products.