Preliminary Experiments for Investigating the Effect(s) of Low Dose-rate Radiation in Murine Bone Marrow

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Abstract

In a previous study, we showed that hematopoietic stem cells (HSCs) in the bone marrow were the most sensitive to whole body low dose-rate (LDR) radiation exposure. Gene expression analysis showed that the decrease in the number of HSCs by LDR irradiation was associated with alteration of biomolecules that control cell cycle and differentiation of HSCs, such as cytokines and hormones. The current investigation focuses on examining these alterations in the bone marrow cell microenvironment during and after LDR irradiation, and requires the preparation of fresh frozen bone marrow tissue sections using Kawamoto's method. Bone marrow tissue sections of femurs and humeri from healthy non-irradiated male C3H mice prepared by using Kawamoto's method were determined to be suitable for immunostaining. After several attempts, we were able to eliminate the autofluorescence produced by lipofuschin (a pigment that appears when mice age), using 3 commercially available reagents. Using these methods, we were able to locate the blood vessels thought to be key structures in the bone marrow microenvironment (niche).

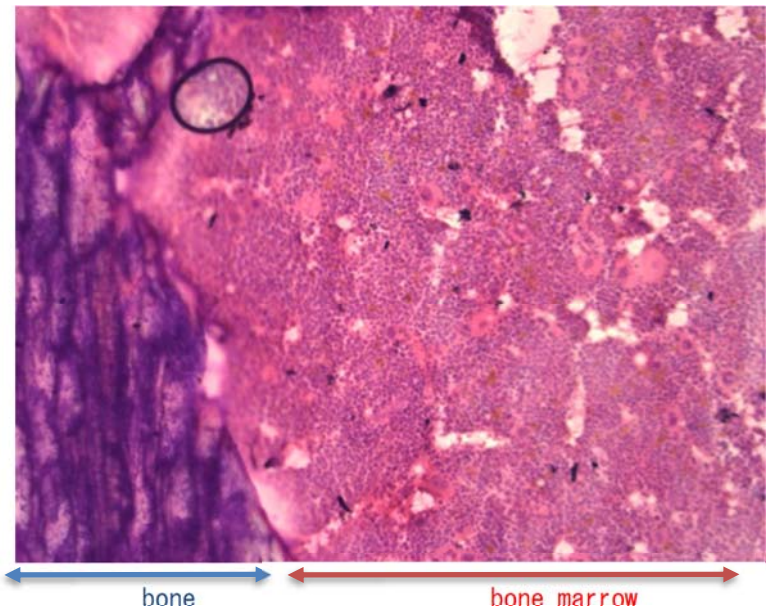

Fig.1 Fresh frozen tissue section of the bone marrow (H&E Stain).

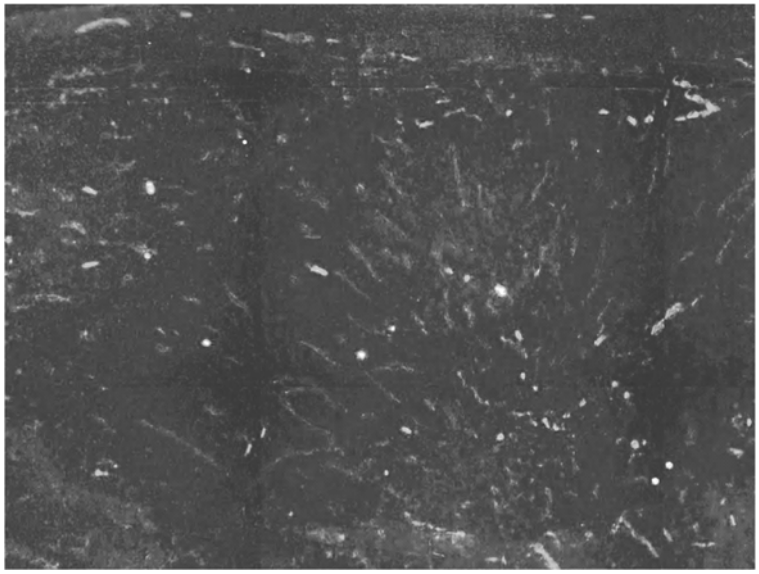

Fig. 2 Fresh frozen tissue section of the bone marrow immunostained with FITC-conjugated Laminin antibody