

Histochemical study of the definitive erythropoietic foci in the chicken yolk sac

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SUMMARY

It is well known that avian yolk sac is involved in both primitive and definitive erythropoiesis during embryonic development. Definitive erythropoiesis is first detected at about 4-5 days incubation and its maximum activity is reached between day 10 and 15 of incubation, ending between days 18 and 20 of incubation. We confirmed the definitive erythropoietic foci in the chicken yolk sac throughout the 5th to 19th day of incubation by histochemical light and electron microscopy. The definitive erythropoietic foci were observed in the yolk sac endodermal layer from day 5 until day 19, just before hatching. Ultrastructurally, definitive erythropoietic foci were observed extravascularly in the yolk sac endodermal cell layer in direct contact with the vitellolysis zone. These findings provide a basis for clarifying definitive erythropoiesis in vertebrates.

INTRODUCTION

Through the evolution of vertebrates, the developing hematopoietic system is characterized by the successive phases in which hematopoietic stem cell differentiation occur. Among vertebrates, the chicken does not use the fetal liver as a major hematopoietic organ. Instead, the chicken maintains blood formation in the yolk sac until bone marrow hematopoiesis is established (Zon, 1995). It is well recognized that avian yolk sac is involved in both primitive and definitive erythropoiesis during embryonic development. Primitive erythropoiesis occurs at the early somite stages (6-8, 9 somites) in the area vasculosa of the yolk sac, formed by an endoder-