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,FFERENT HEMOGLOBINS IN DIFFERENT ERYTHROCYTE POPULATIONS OF THE SHEEP, AND A NEW CONCEPT OF THE HEMATOPOIETIC DIFFERENTIATION IN THE YOUNG MAMMALIAN ORGANISM.

G. Valet, G. Hanser & G. Ruhenstroth-Bauer, Max-Planck-Institut fur Biochemie, D-8033 Martinsried bei Munchen, Germany.

Several erythrocyte populations of different mean volume can be demonstrated by an improved electrical sizing technique in the blood of the rat, mouse, guinea pig, rabbit, sheep, and goat during the first trimenon of life (G.Valet,H.Hofmann.G.Ruhenstroth-Bauer, J.Histochem.Cytochem 24:231, 1976). The populations appear and disappear gradually in a sequential order, and finally one erythrocyte volume population of the adult animal remains. The erythrocyte populations may also be different in other parameters as the electrophoretic mobility, the membrane antigens, the intracellular Na^+/K^+ concentration and the membrane Na^+/K^+ pumps (G.Valet,G.Franz,P.K.Lauf,1977,submitted). The appearence of new erythrocyte populations indicates sudden changes of the hematopoietic differentiation in the young mammalian organism. Furthermore the leukopoietic system is affected. The blood leukocyte counts, the differential counts and the volume of spleen and bone marrow cells change synchroneously with the appearence of new erythrocyte populations. The changes of differentiation occur probably at the stem cell level since the erythro- and the leuko-poietic systems are affected. We have investigated if the different erythrocyte populations contain different hemoglobins. Erythrocytes of a hemoglobin AB type sheep were separated at various times after birth by counter current centrifugation according to their volume. The lysates of the erythrocyte fractions were electrophoresed by isoelectric focusing. The large population I erythrocytes which are mainly present at birth contain fetal hemoglobin. The small population II erythrocytes which are transiently produced from day 5 after birth on, and the population III erythrocytes of the adult sheep contain hemoglobin AB. This indicates that ne HbF-AB switch in the sheep is linked to the appearance of a new erythrocyte population.