



Yolk sac, Bursa, Liver, Bone marrow and Thymus

PRIMARY LYMPHOID ORGANS



YOLK SAC

- **THE SOURCE OF THE EARLIEST HAEMOPOIETIC TISSUE, INCLUDING THE THYMOCYTE PRECURSORS.**

BURSA

- In birds, b lymphocytes differentiated in the Bursa of Fabricius, a cloacal outgrowth with many crypts and follicles, which reaches its maximum size a few weeks after birth and thereafter atrophies. There is no mammalian analogue.



LIVER

- **During fetal life in mammals, the major haemopoietic and lymphopoietic organ**

BONE MARROW

The major site for B cells and as haemopoietic organ





THYMUS

Like the bursa, the thymus reaches its largest size in early life, though the subsequent atrophy is slower. In the mouse it contains almost exclusively cells of the T series, but in some animals there may be variable numbers of B cell as well. T cell precursors are derived, via blood, from the bone marrow; they may undergo some of differentiation in the marrow under the influence of thymic hormones, but most of their maturation occurs within the thymus.



Thymic Hormones

- Thymosin- α_1 , β_1 and β_4
 - Thymopoietin I, II
 - Thymic humoral factor
 - Thymostimulin
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Lymph Node, Spleen, Gut, Lung, Pharynx and Skin

SECONDARY LYMPHOID ORGANS



Lymph Node

Lymph nodes (or 'glands') constitute the main bulk of the lymphoid tissue. They are strategically placed so that lymph from most parts of the body drains through a series of nodes before reaching the Thoracic Duct (TD)

, which empties into the left vein to allow the Lymphocytes re-circulate again via the blood



SPLEEN

- **The spleen differs from a lymph node in having no lymphatic drainage, and also in containing large numbers of red cells**



GUT

- **Peyer's patches of the ileum and lymphoid nodules up and down the gut, sometimes called gut associated lymphoid tissue(GALT).**

LUNG



Like the gut, this is a major site with exogenous antigens, and lymphoid tissue is similarly organized in association to bronchi (BALT).

PHARYNX

- Lymphoid masses, such as tonsils and adenoids, respond to antigens from the nose and throat. Both B and T cells are present and germinal centres are common.

- SKIN

- ANTIGENS ENTERING VIA THE SKIN CAN REACH THE LOCAL LYMPH NODE BY BEING TAKEN UP IN LANGERHANS CELLS, WHICH CAN PASS FROM THE SKIN TO THE NODE.