

Why is the four chambered heart of particular importance to homeotherms?

Homeotherms rely on their own metabolism, not on external sources, to produce body heat. This requires that homeostasis be carefully maintained, providing nutrients and oxygen to all parts of the body. It is therefore necessary that blood be pumped efficiently throughout the body. The four-chambered heart allows for blood to be oxygenated and return immediately to the heart, where it can be effectively pumped throughout the body. Chambers prevent the blood in the heart from mixing and reducing the efficiency of oxygenation. Without such an efficient system, metabolic ability would fluctuate in different areas and the animal would be unable to maintain a constant internal temperature without external assistance.

In addition, homeotherms must undergo a fast adaptation at birth to new sources of oxygenation. The structure of the heart, with temporary fetal shunts, allows the animal to very quickly adjust and survive postnatally.