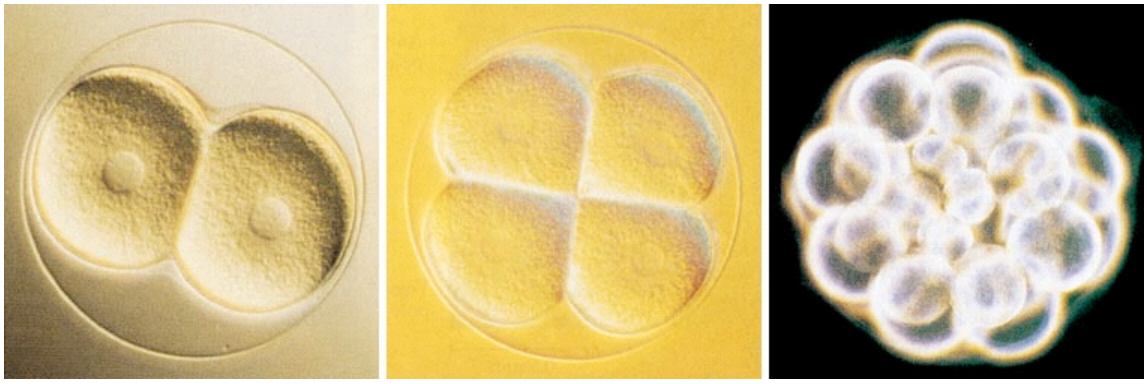
Yolk content and cleavage in human eggs

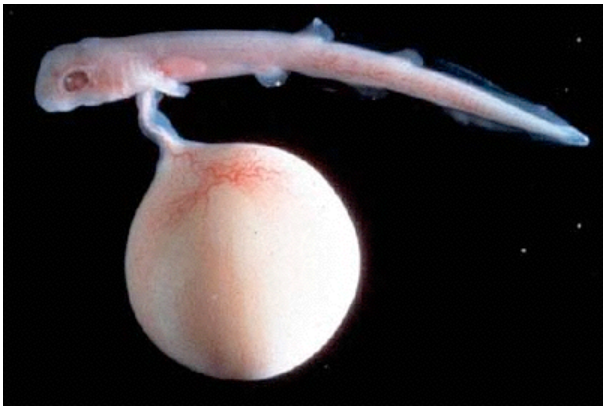
Humans, like other placental mammals, have relatively little yolk in their eggs. This type of egg is termed **microlecithal** (as opposed to meso- or macrolecithal eggs which have moderate and large amounts of yolk, respectively).

When little yolk is present in an egg, as is the case for human eggs, cleavage furrows pass through the entire zygote easily. This type of cleavage is termed **holoblastic**. In eggs with higher yolk content cleavage is slowed or blocked entirely by the yolk mass, leading to meroblastic or (in the eggs with highest yolk content) discoidal cleavage. These types of cleavage are seen in many fish, reptiles, birds, and monotremes like the duck-billed platypus.

What about the reproductive biology of these animals (versus that of placental mammals like humans) accounts for the differences we see in the yolk content of their eggs?



The image above shows holoblastic cleavage in an early embryo.



The shark embryo shown here is the product of meroblastic cleavage in which only a portion of the cytoplasm is cleaved. Note the large yolk sac attached to the embryo. Is this type of structure present in humans?

Download Printable (PDF) Version

Back to Main Menu / Previous Objective / Next Objective /