

9. How do we know that the eyes of a polychaete worm and those of a frog or a mammal are related?

Detlev Arendt studied polychaete worms' genetic makeup and physical structure. He had found that they had elements of both kinds of animal photoreceptors. The normal "eye" was made up of neurons and opsins like the eye of any vertebrate, but they have invertebrate opsins and cellular structure even with the little bristle-like projections, but in primitive form.

10. Humans' significant adaptations and some serious limitations that derive from our fish ancestry.

Provide two examples of each and explain the evidence that relates the human feature to our fish ancestors.

The human larynx is mostly made up of gill arch cartilages, corresponding with the gill bars of a shark or fish. The back of the throat has flexible walls that can open and close; this in combination with tongue movement and changing the shape of our mouth, this is how speech is formed. Sleep apnea and choking are dangerous risks that come along with the flexible walls in our throat. With sleep apnea, while we sleep the muscles in our throat relax and with some people the passage can collapse causing the person to experience a long stretch of time without taking a breath. With our trachea and esophagus both connected to our mouth, it creates a possibility of choking if food goes down the trachea.

The shark's gonads extend toward their chest, approaching their heart. Human male gonads are attached outside of the human body because the human body is too hot for the testes to produce sperm. During fetal development, the gonads start in the chest have to travel down through and out of the body creating a weak spot in the body wall. This puts us at risk for hernias.