

Why are we endotherms(warm blooded) ?

- Energy cost is extraordinary-we consume 30 times as much calories as an equivalent cold blooded (ectotherm)
- It protects us against fungal infections and fungi are everywhere.
 - Humans and all warm blooded mammals and birds have very few fungal infections
 - The lower the core temperature of the mammal or bird, the more fungal infections
 - Platypus (core temp of 32° C)
 - Hibernating bats are killed by fungus that causes white nose syndrome when their bodies are cold with torpor
 - Rabbits have few fungal pathogens, they are prone to them in their testes which are at 35° C
 - Most fungi thrive at temperature between -4 and 30° C, fewer than a third are able to survive at 37° C and just 5% are able to grow at 41° C
 - 36.7° C is the best balance of the costs of being warm with the benefits of defense against fungi

Fungi infections and Cancer Exploration

- People who have cancer report a higher incidence of having had fungi infections
 - Fungus between toes
 - Ringworm
- Compare fungi infection history and core temperature in identical twins where one of the twins has cancer and the other does not (e.g., Laurie versus Karen)
- People who have fungi infections and low core temperature are more at risk for developing cancer
- This may be an economic early screening approach and intervention approach
 - Use whole body hyperthermia as a treatment for fungi infections
 - Develop strategies to increase core temperature