


The Human Animal: Skin



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The Naked Ape



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Mammal Hair

- Thermoregulation
- Protection
 - Abrasion
 - Sunlight
 - Parasites
- Camouflage
- Species recognition
- Social communication



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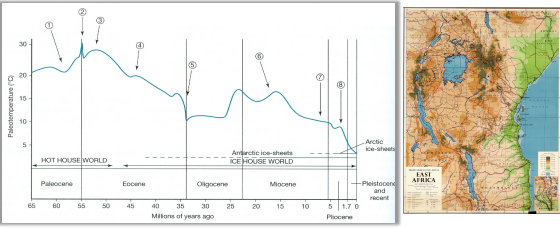
Hairless Mammals



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Climate Change

- Around 3MYA cooling led to decreased rainfall and shrinking of forests



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On the Hot Savannah



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Evaporative Cooling

Panting and Long Snout
Eccrine glands on foot pads only



Apocrine and sebaceous sweat

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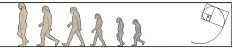
Evaporative Cooling



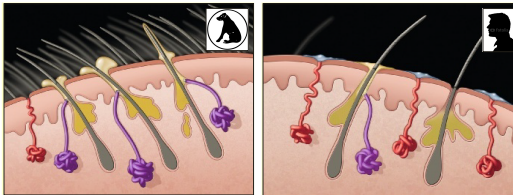
Eccrine sweat glands focus water on bare skin (2-5M in humans)



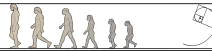
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Mammal vs. Human Skin



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Homo ancestors

- Australopithecines were arboreal in tropical forests
- Capable of bipedal walking
- Ate fruits, leaves, tubers
- Had a sedentary lifestyle



Australopithecus afarensis
3.7- 3MA



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Homo habilis Hunting Meat (2.5MYA)



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Homo ergaster/erectus

- Approx. 1.5MYA
- Modern human proportions
- Fully upright
- Ankle, knee and hip bones indicate good runners
- Consequence: loss of hair, development of sweat glands

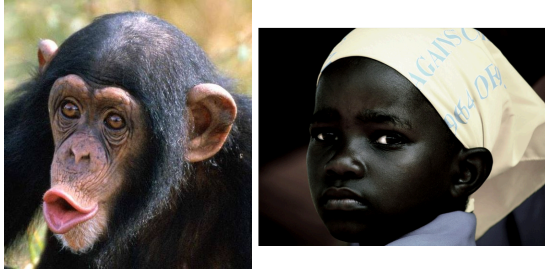


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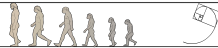


Skin Pigmentation and MC1R Gene

From Pink to Brown/Black Skin

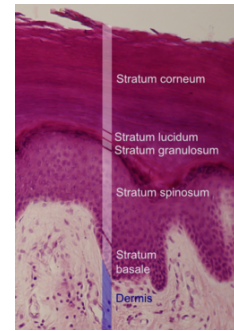


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Genes for Hair Loss

- Genes coding for human skin are unique among primates
- Probably associated with those for Stratum Corneum
- Distinct proteins in SC of humans compared to Chimps
 - Keratin types and involucrin



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Genes for Hair Loss

- Human hair is more fragile than other mammals
- Suggests hair keratins not important for survival during human evolution



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Hair Retention

- Armpit and pubic hair
- Dispersion of pheromones
- Lubricate to prevent chafing during locomotion

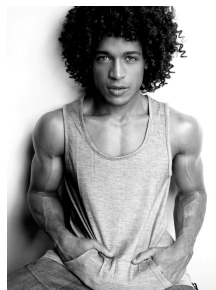


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Hair Retention

- Disperse excess heat from top of head
- Creates boundary layer between sweating scalp and hot surface of hair
- Curly hair probably ancestral to other types as it increases thickness of trapped air



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Masculine Hair Retention

- Product of testosterone
- Subject to sexual selection



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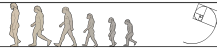


Consequences of Hair Loss

- Allowed for evolution of larger brain
 - Most temperature sensitive organ
- A. afarensis 400 cc
- H. ergaster 800 cc
- H. sapiens 1400 cc
- Also high caloric diet



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Consequences of Hair Loss

- Social communication replaces fur-based
- Body postures and gestures communicate emotion
- Body paint, cosmetics, tattoos are culturally ubiquitous
- We evolved language



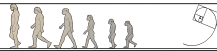
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Body Shape and Heat Loss/Conservation



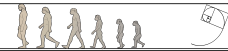
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Compensation for Cold Nights



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Body Lice and Clothing



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