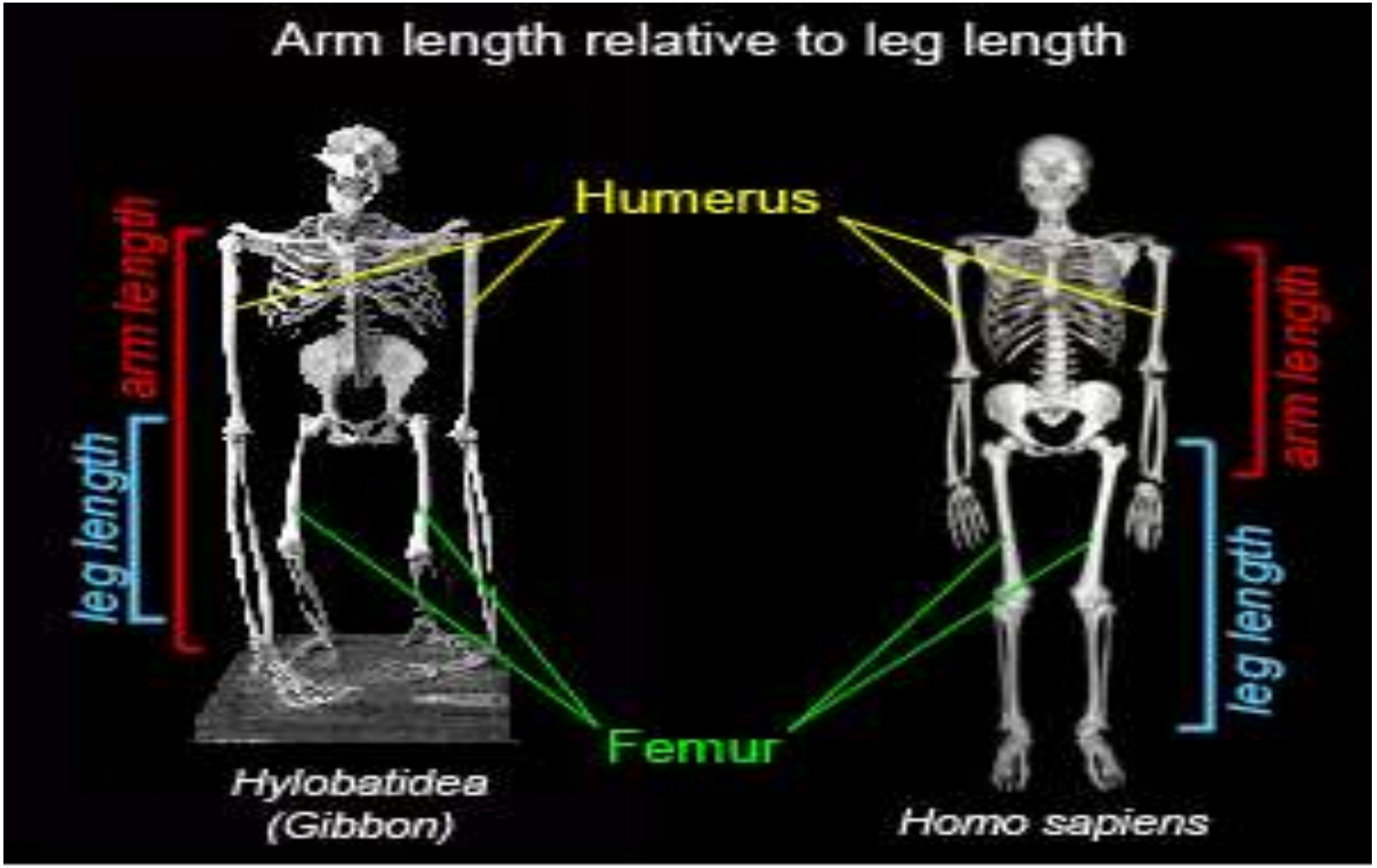
PRIMATE EVOLUTION

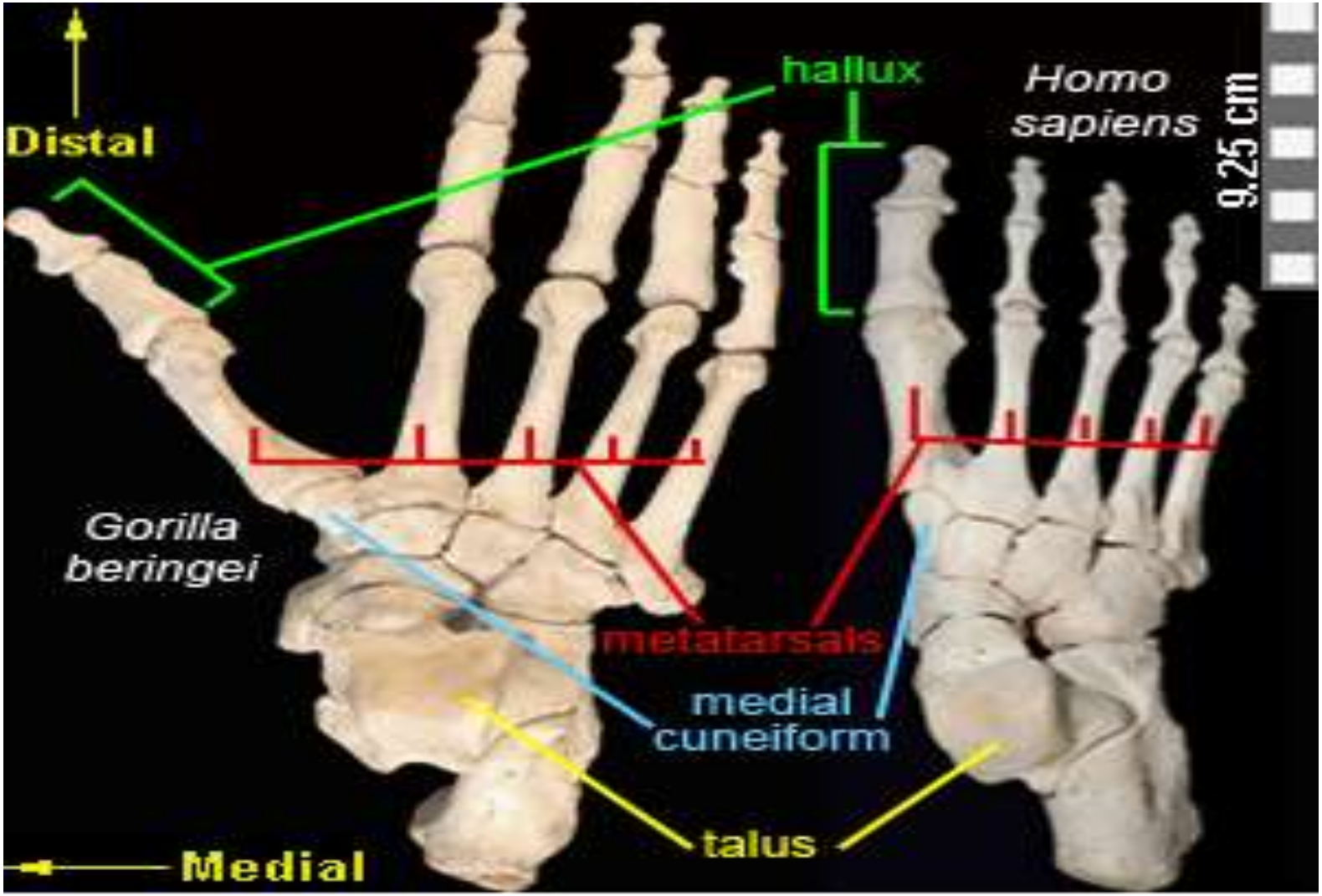
Anatomical basis for bipedalism

- Increased relative length of the lower limb (inverted pendulum)
- The valgus knee
- Lumbar curvature
- Adducted hallux
- Enlarged heel and stable ankle
- A shortened and laterally rotated ilium(gluteus muscles and human pelvic tilt mechanism)

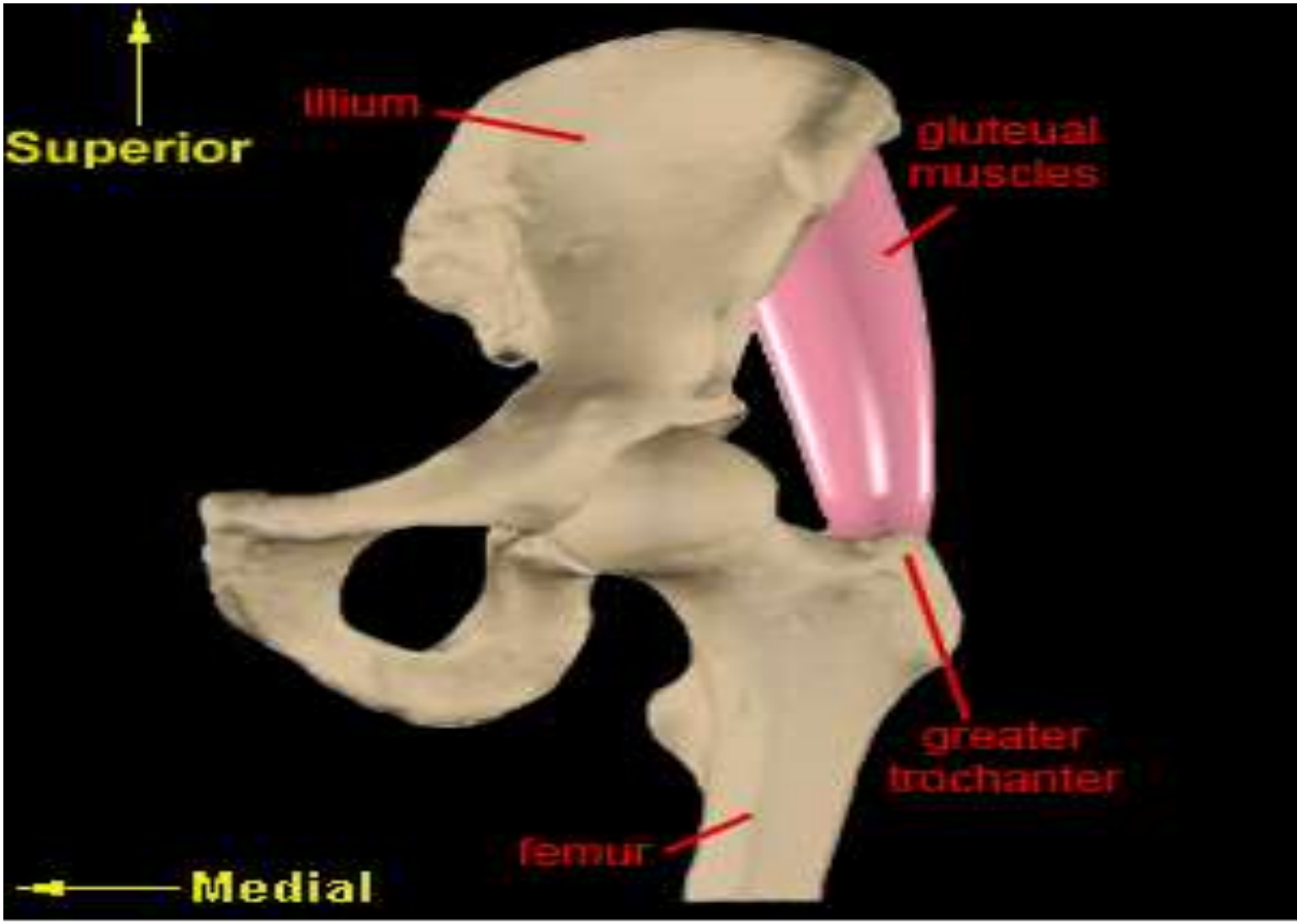


Arboreal primates have longer arms relative to their leg length, while bipedal animals have relatively shorter arms than legs. For instance, gibbons have one of the highest humerofemoral ratios among the great apes. Not not to scale.

The calcaneus is comparatively more robust in bipeds than quadrupeds. Note that the hallux sits parallel to the rest of the toes in humans, but is more divergent in extant apes.

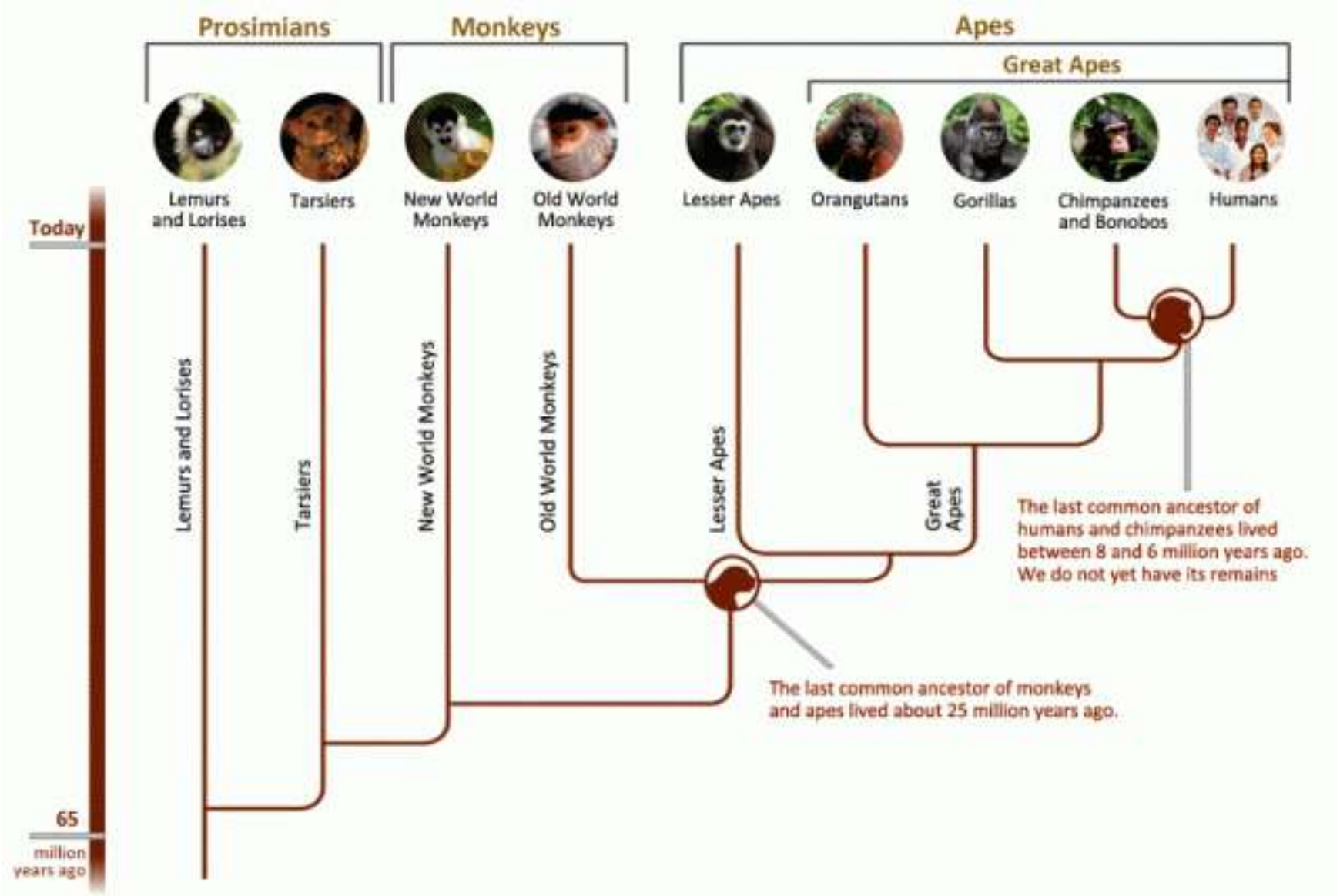


The rounded articular surface of the medial cuneiform in quadrupeds permits a wide range of movement in the hallux. In humans, the hallux sits parallel to the rest of the toes allowing for greater push-off during walking.



An illustration of gluteus medius originating dorsally from the illium and inserting on the greater trochanter as in modern humans.

Genetic similarity between chimpanzee and man



- Researchers found 96 percent genetic similarity and a difference between us of 4 percent.
  - At the end of each chromosome is a string of repeating DNA sequences called telomeres. Chimpanzees and other apes have about 23,000 base pairs of DNA at their telomeres. Humans are unique among primates with much shorter telomeres only 10,000 long.
  - While 18 pairs of chromosomes are virtually identical, chromosomes 4, 9, and 12 show evidence of being "remodeled."10 In other words, the genes and markers on these chromosomes are not in the same order in the human and chimpanzee. Instead of being "remodeled," as the evolutionists suggest, these could also be intrinsic differences
  - Even with genetic similarity, there can be differences in the amount of specific proteins produced. Just because DNA sequences are similar does not mean that the same amounts of the proteins are produced. Such differences in protein expression can yield vastly different responses in cells. Roughly 10 percent of genes examined showed significant differences in expression levels between chimpanzees and humans.

- Gene families are groups of genes that have similar sequences and also similar functions. Scientists comparing the number of genes in gene families have revealed significant differences between humans and chimpanzees.
- Humans have 689 genes that chimps lack and chimps have 86 genes that humans lack.
- Such differences mean that 6 percent of the gene complement is different between humans and chimpanzees, irrespective of the individual DNA base pairs.

- A high degree of sequence similarity does not equate to proteins having exactly the same function or role.
- For example, the FOXP2 protein, which has been shown to be involved in language, has only 2 out of about 700 amino acids which are different between chimpanzees and humans.
- In the FOXP2 protein, humans have the amino acid asparagine instead of threonine at position 303 and then a serine that is in place of an asparagine at 325.
- The humans normally have 23 pairs of chromosomes while chimpanzees have 24.

- Evolutionary scientists believe that human chromosome 2 has been formed through the fusion of two small chromosomes in an ape-like ancestor in the human lineage instead of an intrinsic difference resulting from a separate creation.
- While this may account for the difference in chromosome number, a clear and practical mechanism for how a chromosomal abnormality becomes universal in such a large population is lacking. The fusion would have occurred once in a single individual. Every single human being on earth would have to be a descendant of that one individual. Because there is no selective

- Morphologically humans and apes are distinct from one another.
  - Based on molecular data, isozyme polymorphisms and sequences of mitochondrial and genomic DNA, humans and apes, in particular, chimpanzees are quite similar.
  - Humans and chimpanzees share 52 % of the same alleles.
  - Humans and Chimpanzees share the same Blood Type Phenotypes (ABO SYSTEM)
  - Nucleic acid differences are even less, 1.1 percent difference.