

Department of anatomy



Population polymorphism and geographic variability of Homo sapiens



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Genetic polymorphism

This is the presence of several alleles in the locus with sufficient frequency for their fixation in the population



An allele is one of several sequences of a given gene



Continuous variability: *Pigmentation*





Continuous variability: Hair color



Schematic Diagrams of Dark Hair



1440 BA 14 4 6

golden wheat

le sandy blonde

Continuous variability: Hair color



Continuous variability: Eyes color

The human eye



Continuous variability: Hair texture













coarse straight

straight



wavy

curly

TEXTURE OF HAIR.

tight curly kinky pepperc

COME - Phanet





wavy



curly



http://humanphenotypes.net/metPdsRexture.html

Continuous variability: **Body hair**

Weak is the hair of some East-Asian Mongoloids where beard growth is particularly sparse. In Africa, most of the northern savannah populations (Sudanids, Nilotids, Ethiopids) show very little hair, as well as Malagasy. In America, most groups have little hair, just like in South-East Asia and Polynesia. African forest populations as well as Pacifids and Huarpids of South America show stronger hair growth



Continuous variability: Beard

Very weak Weak Medium Prominent Very prominent

Continuous variability: Face morphology



Continuous variability: Nose

Ridge of the nose



Continuous variability: *Cephalic index*

Cephalic index = $\frac{l_{breadth}(cm)}{l_{length}(cm)} \times 100$

Hyperdolichocephaly was found in some early humans, but is rare today on the population level. The largest area of hyperdolichocephalic dominance is found from Central Australia to North Australia



Continuous variability: Progmatism

Prognathism describes a projection of the jaws. The shape of the lower part of the nose is altered as well.







Orthognathy developed relatively early in the evolution of Homo sapiens and continuously increased in frequency, especially in colder

regions.

prognathous

orthognathous

Continuous variability: Facial index

Facial index = $\frac{l_{facial skull length}(cm)}{l_{bizygomatic diameter}(cm)}x100$

It is measured by the length of the face from the root of the nose to the bottom of the chin. expressed as a percentage of the areatest breadth across the cheek-bones.



Hyperleptoprosops (> 95%) Leptoprosops (90-94,9%) Mesoprosops (85-89,9%) Euryprosops (80-84,5%) Hypereuryprosops (<79,9%)

Leptoprosops population

Continuous variability: Facial prolofereation





Well proliferated face (high nose root, buried cheeks)



Poor proliferated face (low nose root, prominent cheeks)







RISH IBERIAN.

ANGLO-TEUTONIC

NEGRO

Continuous variability: Osteological traits





Censored Censored Censored Censored

Hyper-

Macroskelic Mes

Mesoskelic Brachyskelic

elic Hyper-

In hypermacroskelic individuals the sitting height is greater than 55% of the overall height.



Continuous variability: Body traits Steatopygia In steatopygic



individuals there is a marked accumulation of fat over the buttocks, even when the fat layer of the rest of the body is only slight to moderate. It is found mainly in tropical regions, especially among Khoids.

Today's Homework

Hair type

Epicantus +/-

Nose shape

Lip thickness

Guess the nation

Approx. cephalic type

Beard hairiness

Progmatism















Afro-American





Australian aborigine







Australian aborigine

dated

















Arabic (UA<mark>E)</mark>

Continuous variability: Odontoglyphical traits

Odontoglyphics is the method of classification of the molar grooves defined in an individually distinctive pattern like that of fingerprints.



Continuous variability: Dermatoglyphical traits

Dermatoglyphics is the study of the patterns of ridges of the skin of the fingers, palms, toes, and soles; of interest in anthropology and law enforcement as a means of establishing identity.



Discontinuous variability: Blood



Blood **Discontinuous variability:** types

Karl Landsteiner

Rhesus macaque

<11%

Rh blood group system

15-18%

13-15%

15-18%

20%

Discont	tinu	ous	varia	ability:	Blood
Rh +		Rh -	ist.		types
XXY.			1999	Mother	Father
3012		6	10	rh-rh-	Rh+Rh+
17 F		No la compañía de la			
TAN			200	a	Rh+
DANTIGEN	Father	Mother	Child		
	+	1200	75% +		
		<u> </u>	25% -	Rn+ m-	2 A
Rh blood	+	-	50% +		
aroup			50% -		
system	1273	+	50% +	212	
system		12398	50% -	500	10
		1000	100% -	A	X

Discontinuous variability:

system

HLA



The human leukocyte antigen (HLA) system or complex is a group of related proteins that are encoded by the major histocompatibility complex (MHC) gene complex in humans. These cell-surface proteins are responsible for the regulation of the immune system.

Discontinuous variability:

Hemoglobin





Discontinuous variability:

Taste sensatitivity to phenylcarbamide

(PTC)

Olfactive sensitivity

Chromatic vision

Cranial epigenetic signs



Other

types

Discontinuous variability: Cranial epigenetic signs







Why are phenotypes important?

Differences in humans are not only driven by genetic divergence, but also by phenotypic divergence caused by adaptive pressure.



http://humanphenotypes.net/methods.html and Winker, 2009

Simplified human phylogenetic tree



http://humanphenotypes.net/methods.html and Winker, 2009

Homework



Melanesian Central African South African

Uralic

Indo-Mediter**Ba**lcano-Cocas **Atlanto-baltic** ean n

<u>Homework</u>







Far Eastern South Asian

