

FROM THE WORLD TO PERUGIA

#TIS 5

HOST: PROF. ANTONIO TORRONI

Full Professor of Genetics – University of Pavia



**"ORIGIN AND DISPERSION OF MODERN HUMAN POPULATIONS. A
MATRILINEAL PERSPECTIVE"**

Abstract

The mitochondrial genome (mtDNA) human is a small circular molecule of DNA (about 17,000 base pairs) present in each cell in the hundreds or thousands of copies transmitted exclusively by mother. It also features a higher evolutionary rate than those of nuclear genes. Therefore, its sequence variation is generated exclusively along lines radiation maternal for the sequential accumulation of new mutations. This means that the human mtDNA is an archive of the history and

molecular migration of women who have passed the subsequent generations. Since this process of molecular differentiation was relatively fast, and took place mainly during and after the recent process of colonization and spread of modern humans in different regions and continents, the different subsets (haplogroups and sub-haplogroups) of mtDNA variation tend to be localized in different geographical areas and in different human populations. So the molecular identification of the haplogroups, the quantification of their internal variability, the analysis of their ethnic and geographical distribution provide important data on the origin of man, the times of colonization of regions and continents, and genetic and demographic processes that generated the modern populations. During the seminar will be presented various examples in geographical contexts and ethnic backgrounds.

Latest publications:

- Perego UA, Achilli A, Angerhofer N, Accetturo M, Pala M, Olivieri A, Hooshier Kashani B, Ritchie KH, Scozzari R, Kong Q-P, Myres NM, Salas A, Semino O, Bandelt H-J, Woodward SR, Torroni A. Distinctive Paleo-Indian migration routes from Beringia marked by two rare mtDNA haplogroups. *Curr Biol* 19:1-8 (2009).
- Pala M, Achilli A, Olivieri A, Hooshier Kashani B, Perego UA, Sanna D, Metspalu E, Tambets K, Tamm E, Accetturo M, Carossa V, Lancioni H, Panara F, Zimmermann B, Huber G, Al-Zahery N, Brisighelli F, Woodward SR, Francalacci P, Parson W, Salas A, Behar DM, Villems R, Semino O, Bandelt HJ, Torroni A. Mitochondrial haplogroup U5b3: a distant echo of the Epipaleolithic in Italy and the legacy of the early Sardinians. *Am J Hum Genet* 84:814-821 (2009).
- Perego UA, Angerhofer N, Pala M, Olivieri A, Lancioni H, Hooshier Kashani B, Carossa V, Ekins JE, Gómez-Carballa A, Huber G, Zimmermann B, Corach D, Babudri N, Panara F, Myres NM, Parson W, Semino O, Salas A, Woodward SR, Achilli A, Torroni A. The initial peopling of the Americas: a growing number of founding mitochondrial genomes from Beringia. *Genome Res* 20:1174-1179 (2010).
- Achilli A, Olivieri A, Soares P, Lancioni H, Hooshier Kashani B, Perego UA, Nergadze SG, Carossa V, Santagostino M, Capomaccio S, Felicetti M, Al-Achkar W, Penedo MC, Verini-Supplizi A, Houshmand M, Woodward SR, Semino O, Silvestrelli M, Giulotto E, L. Pereira, Bandelt H-J, Torroni A. Mitochondrial genomes from modern horses reveal the major haplogroups that underwent domestication. *Proc Natl Acad Sci USA* 109:2449-2454 (2012).
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