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"Evolutionary genetics using ancient DNA or how to avoid boring research"

Tuesday, 13 November 2012 at **16:00** hrs
at the amphitheatre of FORTH "Georgios Lianis"

The research field of ancient DNA started quite modest with the analysis of 140-year-old DNA from the extinct quagga, but rapidly turned to topics much more attractive to the general public and the media alike such as the analysis of dinosaur DNA. Unfortunately, all the reports on millions of years old DNA later turned out to be false positives due to contamination with modern DNA, seriously damaging the scientific reputation of the field for years. During the last decade technical progress has resulted in an enormous revival of ancient DNA research, peaking in the first publication of complete genomes obtained from ancient DNA.

However, ancient DNA research is much more than complete genome data such as the recently published Denisova hominin genome. Strictly speaking, it is not a research field in itself, but simply a technology that allows obtaining genetic information from degraded DNA, be it 50-year-old museum specimens or 500,000-year-old sediments from Greenland's glaciers. These sequences can then be used to investigate almost any type of evolutionary genetics questions, ranging from phylogenetics over population genetic to functional genetics and many other types of studies. The two big advantages of ancient DNA in all these research fields are that it makes specimens and species accessible for genetic studies that are unavailable with modern DNA alone and that it adds time depths to evolutionary genetics. In my talk I will show how ancient DNA has contributed to a better understanding of evolutionary processes in both extant and extinct species, with examples ranging from what we have learned from ancient DNA about the hair colour of Neanderthals to the genetic identification of mysterious river sharks. I will also show that ancient DNA has also helped us to better understand past climatic and environmental changes, the process of animal domestication, Late Pleistocene extinctions and the quality of prehistoric human art.

www.york.ac.uk/biology/research/ecology-evolution/michael-hofreiter