

# **Domestic dog: the oldest human domesticate**

## **Multiple DNA-based approaches on the study of Portuguese dog breeds and their genetic affinities**

Ana Elisabete Pires<sup>1,2</sup>, Margarida Gomes<sup>3</sup>, Francisco Petrucci-Fonseca<sup>1</sup> & Michael W. Bruford<sup>4</sup>

<sup>1</sup> Centro de Biologia Ambiental, Faculdade de Ciências da Universidade de Lisboa

<sup>2</sup> Instituto Nacional de Engenharia e Tecnologia Industrial, Departamento de Biotecnologia

<sup>3</sup> Escola Superior Agrária de Santarém

<sup>4</sup> University of Cardiff, School of Biosciences

### **Abstract**

The domestic dog (*Canis familiaris*, Linnaeus 1758) is the animal species domesticated earliest by man. Although originating in East Asia, most probably 15,000 years BP, the majority of dog breeds, as we know them, are very recent. Based on FAO criteria, the conservation status of Portuguese dog breeds range from Endangered to Vulnerable. An understanding of the origin, genetic diversity and relationships among the Portuguese breeds is critical in order to provide a scientific basis for management plans. Only by preserving marginal dog breeds with evidence for particular qualities, morphological and/or behavioural, is it possible to maintain and manage *Canis familiaris* genetic diversity. This study therefore focused on measuring genetic diversity at the molecular level in Portuguese and related breeds. Three different markers were applied in this study: microsatellites, Amplified Fragment Length Polymorphisms (AFLPs) and mitochondrial (mt)DNA sequencing. Six canine microsatellites, five primer combinations for AFLP and a fragment of 887 base pairs of mtDNA (corresponding to partial sequences of Control Region and Cytochrome b regions) were examined in unrelated individuals from 11 recognized breeds. Geographically proximate breeds from Spain and North Africa (Morocco) were also studied. Preliminary results will be presented. The genetic variability values are high and similar to those found for other dog breeds but a low inter-breed genetic structure was detected. Surprisingly the most diverse breed is Azores Cattle Dog, an insular breed. Portuguese Water Dog, once mentioned in the Guinness Book of World Records as the rarest dog breed in the world does not show unusually low values of genetic diversity. This study extends the geographic range of an uncommon mtDNA lineage to Portugal and North Africa and increases its haplotypic diversity. Castro Laboreiro WatchDog, the breed having the most remote distribution, shows a unique and exclusive haplotype.

Poster

**VII Portugalia Genetica – Humans and Other Domesticates**

**Instituto de Patologia e Imunologia Molecular da Universidade do Porto, Porto,  
18-20 março 2004**