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1 **Defining mtDNA origins and population stratification in Rio de Janeiro**

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14 **Highlights**

15 Population data (n = 205) are reported for the mtDNA control region in samples from Rio
16 de Janeiro (Brazil).

17 High haplotype diversity is present in Rio de Janeiro as a result of significant African,
18 European and Native American contributions.

19 The main maternal gene pool can be traced to Africa, arriving mainly from the Atlantic
20 Coast region.

21 A comparison between mtDNA and autosomal data revealed population substructure,
22 which has to be considered in forensic analysis.

28 **Introduction**

29 Genetic profiling is commonly used to assist criminal investigations. The study of genetic
30 markers in forensic casework requires the implementation of DNA databases
31 representative of the composition of reference populations. The accuracy of these
32 databases is crucial to correctly estimate the frequency of a genetic profile, which is the
33 only way to attribute statistical weight to the evidence. Additionally, to avoid erroneous
34 estimates of the probability of a certain observation, it is also important to evaluate if

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