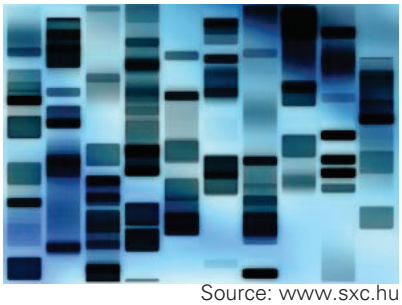
HUMAN GENETIC IDENTIFICATION KIT

Be it due to the fury of Nature or of Man, many lives may be lost at once. The rapid and correct identification of these victims is one of the greatest challenges of Forensic Science.



Source: www.sxc.hu

Idea | **Laboratory** | Prototype | Scale-up | Market

► Product

Description

A human genetic identification kit based on Mitochondrial DNA specific for individuals belonging to populations with a high degree of miscegenation (high genetic variability).

Problem

In 2010, worldwide air traffic accounted for the transportation of 36 million passengers (IATA, 2010). There are about 7.5 million Latin American emigrants, among which 2.5 to 4 million are Brazilian (ONU, 2010). The Brazilian population shows high rates of miscegenation resulting from 500 years of cross-breeding among native, African and European ethnicities, making their genotypic characterization even more difficult (Paneto *et al.*, 2011). The genetic profile of an individual, which is commonly used in human identification, is based on the combination of several markers that are inherited from his/her ancestors. Natural mass disasters (Japan, 2011), air accidents (Rio-Paris flight, 2009) and terrorist attacks represent a challenge to Forensic Medicine. Any delay indentifying the victims may cause public health problems due to the large number of casualties. The analysis of genetic profiles has also been used as irrefutable evidence of the connection of suspects to victims or crime scenes in many legal processes.

Proposed solution

A kit containing primers for the identification and minisequencing of 42 specific genetic markers (single nucleotide polymorphisms – SNPs) of Mitochondrial DNA in samples with small quantities of genetic material or degraded nuclear genetic material. The kit allows for the identification of samples belonging to populations with a high degree of miscegenation and their classification into groups with common ancestors.

Benefits

The technology allows for the identification and classification of samples belonging to populations with a high degree of miscegenation.
The technology is highly sensitive, using only 10 pg of DNA, which allows for the identification of degraded samples or samples containing little genetic material, for example, fragments of hair without roots or partially carbonized samples.
The technology also presents high specificity, since it uses 42 markers for identification, while similar tests use only 16 markers.
Identification and classification into related global groups can be performed in a single test, making it more agile, a particularly desirable characteristic in situations with large numbers of casualties such as natural disasters of major proportions and terrorist attacks.
The technology was validated in 160 blood samples from the Brazilian population.

Market potential

The major police organizations responsible for the identification of victims in situations involving large numbers of casualties have laboratory facilities and budgets to maintain genetic identification services. The joint budgets of INTERPOL, EUROPOL, the FBI (USA), BKA (Germany) and PF (Brazil) amounted to approximately US$ 11.2 billion in 2010. The FBI itself allocated US$ 425 million to its criminalistics lab.
The main corporation of the molecular diagnostics sector reported revenue of over US$ 1.7 billion in 2010. At another company operating in this sector, 26% of sales are destined for government organizations and universities, which represent a market of US$ 572 million.

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