



Date  
October 9<sup>th</sup> 2014

## SelectaDNA Spray: Safety Assessment

Systox Limited was requested to make an assessment of the safety in use of SelectaDNA Spray. The assessment was based upon a literature search of the mammalian toxicity of the disclosed chemical components of the mixture and information provided by the manufacturer of the synthetic DNA. It was concluded that the product is of extremely low toxicity with the main ingredients having been used for many years without complaint in a wide range of consumer products with more prolonged and extensive exposure. Considering the infrequent deployment of the SelectaDNA Spray it is concluded that it is essentially safe.

The SelectaDNA Spray is marketed by Selectamark Security Systems plc. It is marketed as a synthetic DNA security forensic marking system. SelectaDNA Spray is a water-based mixture containing a UV optical brightener (2%), an emulsifier/surfactant (0.5%) and trace quantity (c.a. 0.000001%) of synthetic DNA. When an intruder walks in front of the dispenser the spray is activated, covering the intruder in a uniquely coded invisible DNA marking spray that links them to the crime scene, while the UV tracer is difficult to remove from clothing and skin and cannot be transferred.

The toxicology of the chemicals present in SelectaDNA Spray can be characterised as robust and justify a high level of confidence in the safety assessment.

The UV optical brightener (C.I. Fluorescent Brightener 28, disodium salt; CAS 4193-55-9) used in SelectaDNA Spray is widely used as an optical brightener in cleaning products, in the manufacturing of textiles and of pulp and paper products. It is virtually nontoxic after single ingestion, short-term skin contact and short-term inhalation, has no known repeat dose toxicities and is not anticipated to be genotoxic, carcinogenic, or toxic to development or the reproductive system. The emulsifier/surfactant (Triethanolamine (TEA); CAS 102-71-6) is an approved food additive and a common ingredient in both industrial and consumer products (liquid laundry detergents, dishwashing liquids, general cleaners, hand cleaners, polishes, metalworking fluids, paints and printing inks) as well as some medical (some ear drops used to treat impacted earwax) and cosmetic products (cleansing creams and milks, skin lotions, eye gels, moisturisers, shampoos, shaving

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foams, cleansing milk/cream emulsions). TEA is of low toxicity following single exposures, although some signs of systemic toxicity have been observed at high exposure levels with mild skin irritation being observed following repeated skin exposures. TEA is not genotoxic, carcinogenic, or toxic to development or the reproductive system. The synthetic DNA is a macromolecule and as such is not anticipated to be absorbed into the body. It's synthetic origin would point to it not being a biohazard and although no information was found regarding immunogenicity, it is not anticipated to be strongly immunogenic at the extremely low concentrations used in the product.

In regard to exposure to SelectaDNA Spray, the intruder would potentially be exposed to a fine mist for a relatively short period while passing under the dispenser. The likely routes of exposure will include the skin and eyes as well inhalation. Oral ingestion, although not of concern, is extremely unlikely. Based upon the brief, low level of exposure to the product and that the principal chemicals have been used for many years in consumer products typically associated with repeated and sometimes intentional skin exposure, can be assumed it is highly unlikely that SelectaDNA Spray will cause adverse skin reactions. Ocular exposure also will be extremely brief and unlikely to cause significant, if any irritation. Brief inhalation of mist is likely to occur, however, as the mist produced is relatively coarse with mist droplets larger than 100µm in diameter they will mainly deposit in the nasal cavity and upper respiratory tract and not gain access to the lower respiratory tract so the cause significant adverse respiratory reactions is low.

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