

Exposure to 'Prestige' fuel causes short-term damage to rat DNA

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This image shows cleaning work of the oil slick caused by the Prestige. Credit: StephaneMGueso.

An experiment carried out on rodents exposed to fuel similar to that of the Prestige tanker oil spill – which took place nearly a decade ago – shows that inhalation of the fuel causes damage to genetic material. According to the study, led by the University of A Coruña, the results could be used in relation to people who carry out the industrial cleaning of coasts.

On 19 November, it will be ten years since the sinking of the Prestige, which caused one of Spain's largest ecological disasters. The oil spill reached the [coasts](#) of [Galicia](#) and the rest of the Cantabrian coast, right up to the Landes area of France and Portugal. Thousands of people aided

in the cleaning of the contaminated beaches and were exposed to the fuel for prolonged periods.

In order to confirm the effects of such exposure on the health of human beings in this and other circumstances, a team of researchers from the University of A Coruña carried out an experiment using two different strains of rat and a respiratory chamber especially designed to create fuel exposure. For two hours a day, five days a week, the animals were exposed to a fuel similar in composition to that of the Prestige oil spill. This study has now been published in the [Journal of Toxicology and Environmental Health](#).

"Induced damage to genetic material and the development of different respiratory ailments has been previously seen in people who took part in the [oil spill cleanup](#) effort," Vanessa Valdiglesias, researcher at the Toxicology Unit of the University of A Coruña, explains to SINC. The former institution, along with the Institute of [Biomedical Research](#) of A Coruña, has already tried to describe the effects of the oil spill on people's health.

"Nevertheless," continues Valdiglesias, "in these studies, the [environmental exposure](#) measures were scarce or nonexistent, which made it difficult to attribute the observed effects directly to fuel exposure."

The new study of rats shows a direct link between respiratory exposure to compounds discharged by the fuel and damage to [genetic material](#). In order to analyse the possible alterations to the DNA and its repair processes, the researchers took blood samples from each animal and carried out cytogenic tests.

The results were clear: exposure to fuel through [inhalation](#) causes damage to the DNA of both types of rat – both of which differed in

susceptibility to the compounds of the fuel – and also alters DNA repair processes.

The research group evaluated the damage to the DNA on a global scale, and more specifically looked at oxidative damage, with the aim of guiding decisions regarding diagnosis and therapy in the care of those affected by fuel exposure, whatever the circumstances. "This involves those professionals carrying out their occupational duty in extraction wells, refineries, petrol stations etc, as well as those who aid the cleanup efforts following [oil spills](#)," the main author explains.

Valdiglesias proposes to inform people properly of the health risk which such exposure carries. "I believe coordination and general organisation of cleanup activities in affected zones is also relevant," she continues.

In her opinion, however, the most important thing is to follow the instructions given by the professionals when it comes to the protective gear which should be worn in each case – such as the use of masks, gloves and overalls – and the correct way of wearing these items.

It must be borne in mind that certain higher risk groups, such as children, pregnant women and those suffering from cardiorespiratory illnesses "should avoid exposure to fuel as much as possible," Valdiglesias concludes.

More information: Valdiglesias, Vanessa; Kilic, Gözde; Costa, Carla; Amor-Carro, Oscar; Mariñas-Pardo, Luis; Ramos-Barbón, David; Méndez, Josefina; Pásaro, Eduardo; Laffon, Blanca. "In vivo genotoxicity assessment in rats exposed to Prestige-like oil by inhalation" *Journal of Toxicology and Environmental Health-part A*-current issues 75. Pages: 756-764 [DOI: 10.1080/15287394.2012.689801](https://doi.org/10.1080/15287394.2012.689801), 2012.

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