



An acute exposure to perfluorooctanoic acid causes non-reversible plasma membrane injury in HeLa cells[☆]

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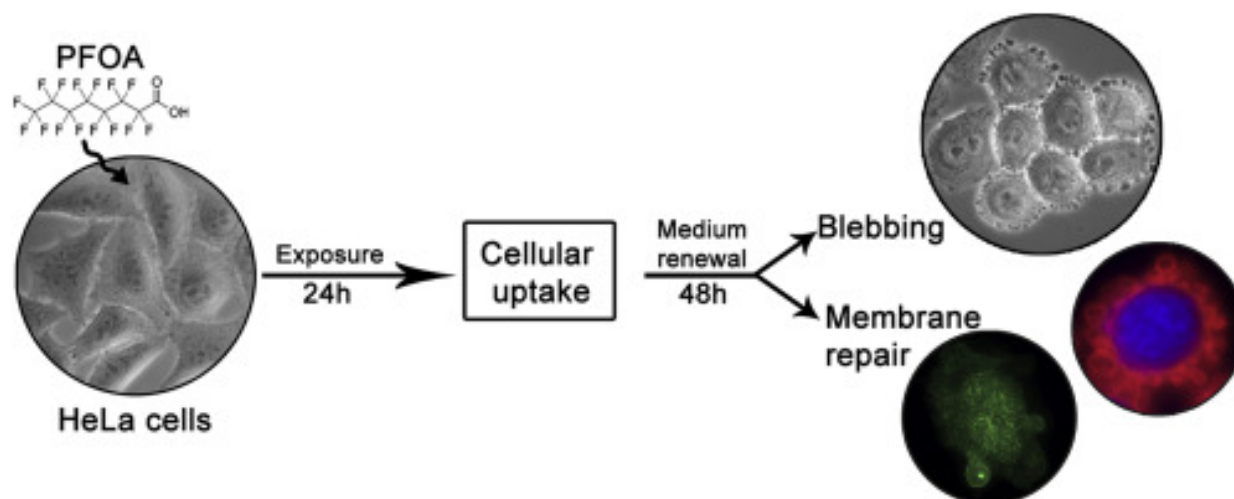
Reversibility

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ABSTRACT

Health and environmental risks regarding perfluorooctanoic acid, a well-known perfluorinated compound, are still a subject of great concern. Ubiquitous exposure and disparity of results make it difficult to determine the underlying mechanism of action, especially at the cellular level. This study proposes an experimental design to assess the reversibility of adverse effects after a one-time exposure to the compound, in comparison with other more conventional timings. Complementary endpoints including total protein content, neutral red uptake and MTT reduction tests along with division rates and microscopic observations were evaluated in HeLa cells. In addition, PFOA quantification inside the cells was performed. The cellular effects exerted after 24 h exposure to perfluorooctanoic acid are non-reversible after a 48 h recovery period. In addition, we describe for the first time the induction of plasma membrane blebbing and the activation of membrane repair mechanisms after recovery from non-cytotoxic treatments with the compound. This experimental design has provided relevant information regarding the toxicity of this perfluorinated compound, relating all the adverse effects detected to its interaction with the plasma membrane.

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- PFOA exposure produces non-reversible effects on HeLa cells.
- PFOA increases mitotic index after 24 h and 24 + 48 h treatments.
- Exposure to PFOA induces plasma membrane blebbing and membrane-repair mechanisms.
- Uptake of PFOA and interaction with plasma membrane mediate cellular injuries.

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