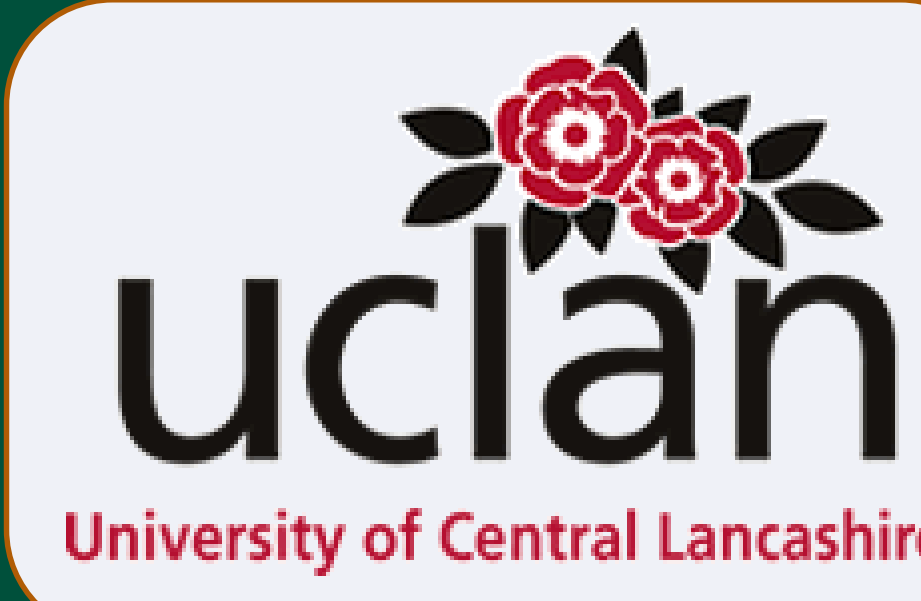




MONITORING FIRE EFFLUENT BIOMARKERS TO REDUCE THE INCIDENCE OF CANCER IN UK FIREFIGHTERS



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BACKGROUND

Cancer incidence in firefighters is found to be higher when compared to the general population. Strong relationships have been drawn between some of the chronic fire toxicants and incidences of non-Hodgkin's lymphoma, multiple myeloma, bladder and prostate cancers.

STUDY OBJECTIVES

The objective of this research project is to identify different chronic fire effluents and evaluate their exposure routes (inhalation, dermal absorption) through the collection and analysis of biological samples. Exposure time versus toxins clearance from the body will be also identified together with various cleaning and decontamination methods (soap, wipes, shower etc.)

CONCLUSIONS

The expected outcome of this project is to introduce prevention measures to reduce high cancer rates in UKs firefighters.



METHODS

Chronic Fire Effluents Identification and Analysis

Examples of Chronic Fire Effluents

- Volatile and Semi Volatile Organic Compounds
- Polycyclic Aromatic Hydrocarbons
- Polychlorinated dibenzodioxins and furans
- Polychlorinated biphenyls
- Polybrominated diphenyl ethers
- Organophosphorus Flame Retardants

Biological Samples Collection

- Blood
- Urine
- Saliva

Exposure Route

- Dermal
- Ingestion
- Inhalation

Toxicant	Endpoints/ Associated Cancers	Exposure route	Sample collection	Elimination time	Analysis
Benzene	Leukaemia, Non-hodgkins Lymphoma,	Inhalation, Dermal and Ingestion	Urine; Whole blood; Exhaled air	5 hours	GC-MS HPLC-MS
Bisphenol A	Endocrine disorders	Inhalation and Dermal	Urine	~5.4 hours, 5.6-8 hours	GC-MS HPLC-MS
PAHs, Benzo[a]pyrene	Skin, Lung, Bladder, Gastrointestinal	Inhalation, Dermal and Ingestion	Urine; Whole blood; Exhaled air	18-20 hours; Dependent on protein-adduct bond.	GC-MS HPLC-MS
Perfluorooctanoic acid/ sulfonate	Breast, Bladder, Prostate	Inhalation, Dermal	Serum	3-9 years	LC-MS