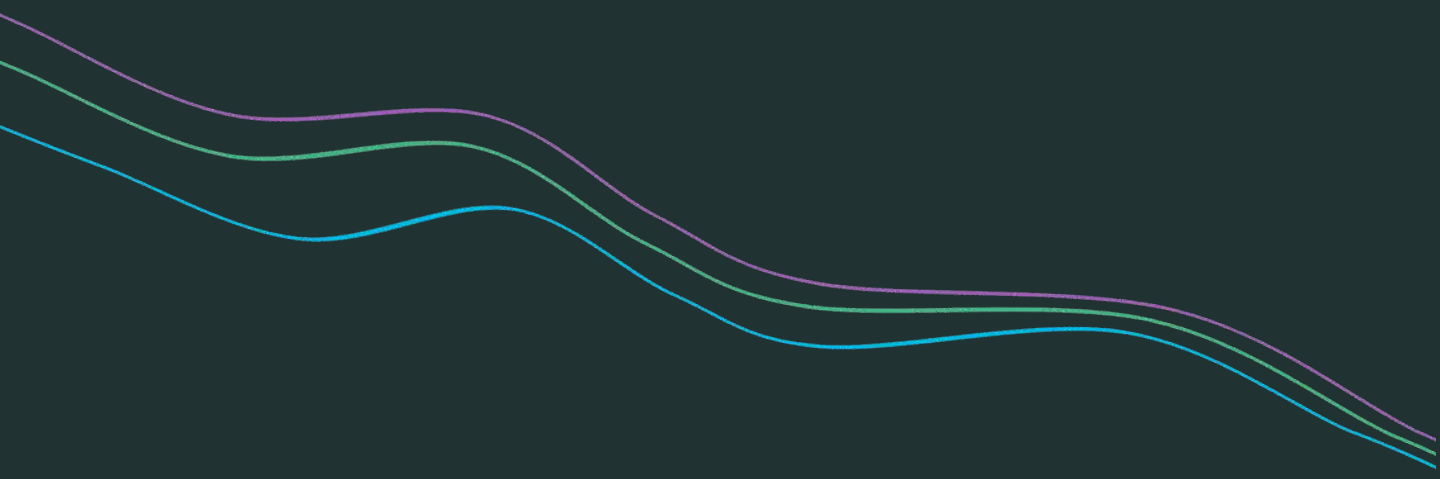
University of Hertfordshire UH

Toxicology Research Group

go.herts.ac.uk/toxicology
email: trg@herts.ac.uk

Research & Development Support Services



‘One of the World’s Leading Toxicology Research Laboratories’

- Nature, 26 February 2019

CERTIFIED LR ISO 9001:2015

COVID-19 PPE Evaluation

Services Offered

Our large (160 m^3) halochamber allows testing of PPE under 'in use' conditions to quantify the protection afforded by PPE against viral particles simulated by an aerosol challenge of salt nanoparticles. We also offer testing of face masks and respirators in accordance with BS EN 149 and other international standards.

Evaluation of PPE while performing physical tasks within a salt nanoparticle environment.

Salt nanoparticles are produced as a polydisperse aerosol using a high flow generator.

Our Supporting R&D Experience

Evaluation of the performance of respiratory protective equipment during physical tasks common to clinical environments within a simulated COVID-19 contaminated environment.

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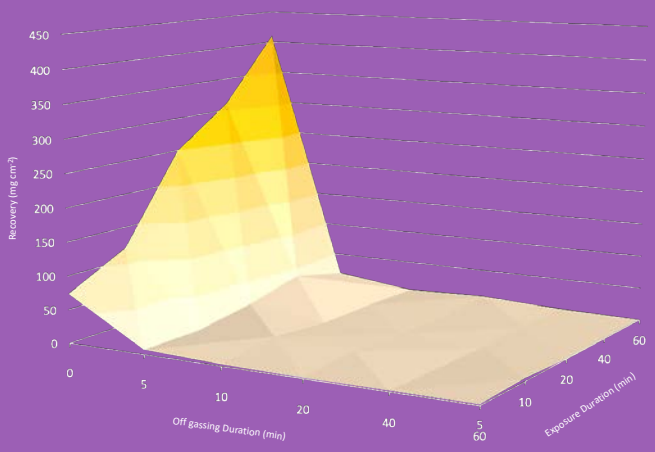
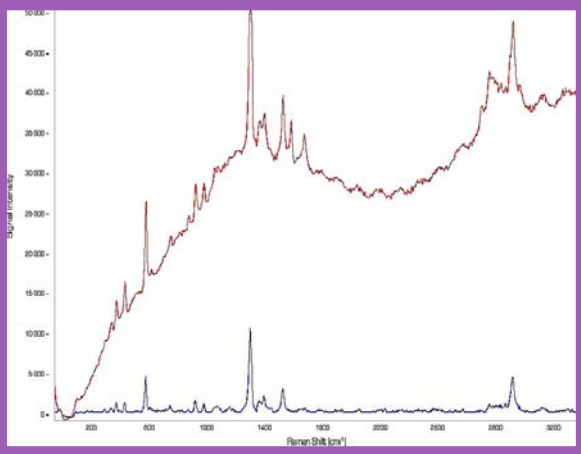
Detection

Services Offered

Quantitative evaluation of chemical and explosive detector performance under controlled, realistic or extreme conditions of use.



Recovery of a volatile toxic industrial chemical from the skin surface, expressed as a function of exposure duration and time post exposure.



Isolation of a chemical-specific Raman signature (lower line) from a mixture (upper line) using a novel, signal-enhancement technology.

Our Supporting R&D Experience

Development of generic technology platforms to improve existing methods and novel technologies for the retrospective identification of exposure to toxic substance based on “man as detector” concept.

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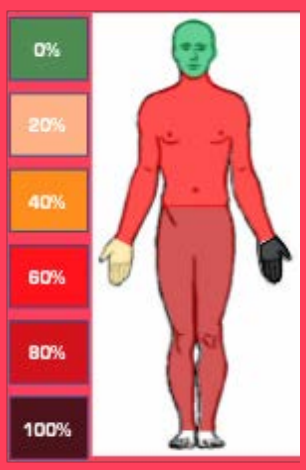
Protection

Services Offered

Assessment of protective materials and equipment from individual components to whole ensemble using internationally-approved methodologies (swatch and MIST) or bespoke study designs utilising robotic mannequins.



Assessment of a safe undress procedure using quantitative whole body fluorescence imaging to demonstrate cross-contamination of wearer.

Evaluation of a PPE ensemble (with simultaneous physiological monitoring of wearer) within the TRG large volume exposure chamber.

Our Supporting R&D Experience

Design and evaluation of safe undress procedures and development of quantitative, whole body chemical dosimetry for analysis of vapour exposures.

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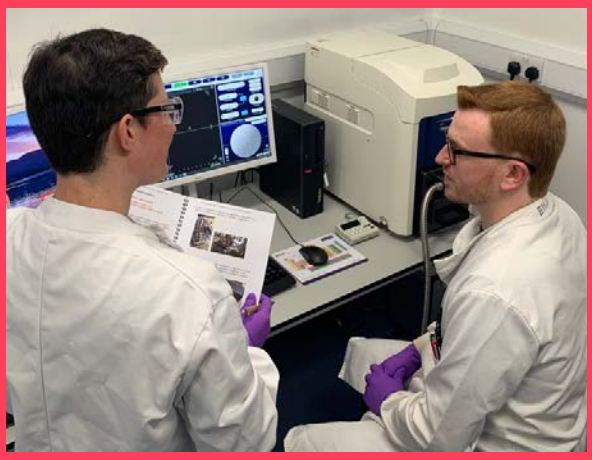
Quality Assurance

Services Offered

Independent consultation and QA auditing services to support companies preparing for ISO 9001:2015 or ISO/IEC 17025:2017 accreditation.



Developing a standard operating procedure for new laboratory equipment.

Auditing established laboratory processes.

Our Supporting Experience

Our Quality Assurance staff are actively engaged in maintaining our current ISO accreditation and collectively have more than two decade's experience of GxP, ISO 9001:2015 and ISO/IEC 17025:2017 Quality Assurance.

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Decontamination

Services Offered

We provide an internationally renowned service for quantifying the effectiveness and safety of decontamination products against chemical, biological and radiological threats using a globally unique laboratory test system in conjunction with confirmatory clinical studies.

Specialist system for simultaneous evaluation of hair and skin decontamination products.

Evaluation of a large volume water process for mass casualty decontamination.

Our Supporting R&D Experience

Design and validation of a novel diffusion cell system for laboratory determination of hair and skin decontamination products. Development of personal, infrastructure, vehicle and equipment decontamination systems.

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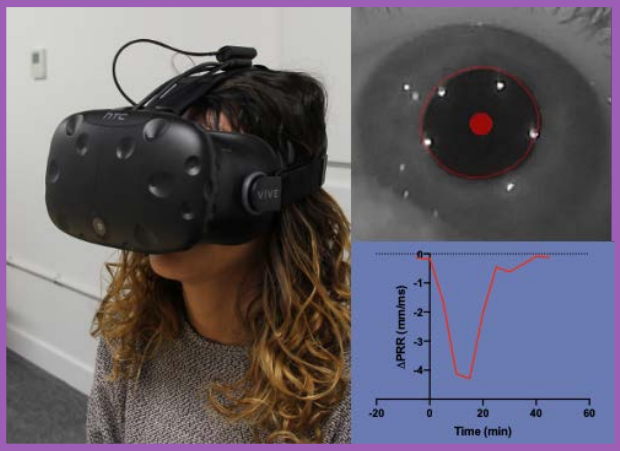
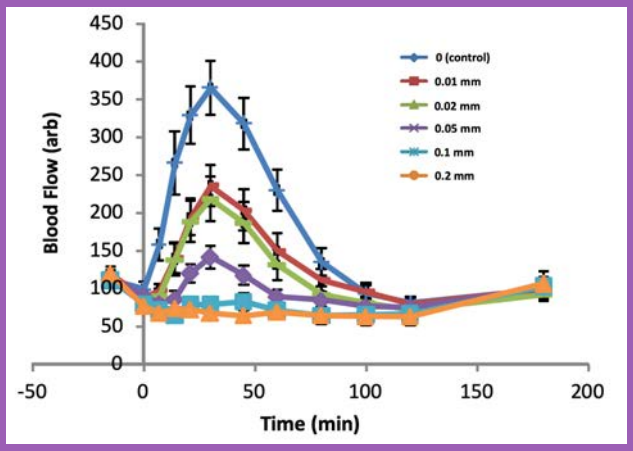
Medical Diagnostics

Services Offered

We can design and perform laboratory and clinical studies to support development of prototypes and regulatory approval of devices.



Prototype pupillometer measuring the effect of a CNS depressant on pupillary reflex with time post administration.



Determination of the optimum thickness of a protective skin cream performed as part of a GCP-compliant clinical study.

Our Supporting R&D Experience

Pioneering development of sebomics for forensic applications and chromodynamic pupillometry as a generic diagnostic/prognostic indicator of exposure to toxic materials and infections.

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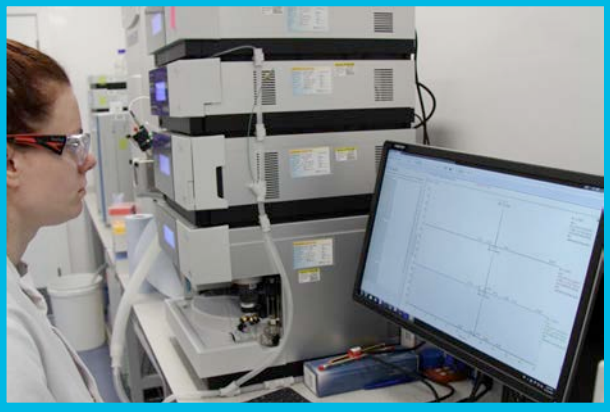
Forensic & Chemical Analysis

Services Offered

We provide chemical analytical services such as screening for substances of abuse, toxic industrial chemicals, heavy metals, pharmaceuticals, CW agent simulants and toxins in a variety of matrices for forensic and research applications.

Use of confocal Raman microscopy to identify and map areas contaminated with a controlled substance on the internal surface of a syringe barrel.



We pride ourselves in running a highly adaptable R&D facility within the framework of a formal quality management system to provide analysis for a range of applications.

Our Supporting R&D Experience

Application of SEM-XDS for visualisation of micronutrients within cellular structures, time-resolved localisation of therapeutic agents within skin tissue by micro-autoradiography and development of a multiplex assay for simultaneous analysis of multiple prohibited substances.

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Training, Exercising and Education

Services Offered

Educational programmes on CBRN threat agents and associated detection and medical countermeasures. Practical training of first responders in accordance with IOR and PRISM incident response processes under realistic environmental conditions. Design, planning and implementation of large-scale exercises.

Example of a bespoke illustration to supplement first responder training for chemical incidents involving emergency decontamination of casualties.

Large scale, multi-agency incident response exercise involving more than 500 responders, volunteers and support personnel to evaluate new US federal guidance (PRISM).

Our Supporting R&D Experience

Performance of quantitative, multi-agency, large-scale exercises and subsequent derivation of evidence-based guidance and training documentation.

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Relevant Publications

T. Ehtezazi, D.G. Evans, P.A. Evans, V.J. Vadgama, J. Vadgama, F. Jared, N. Gre, R.P. Chilcott. SARS-CoV-2: Characterisation and mitigation of risks associated with aerosol generating procedures in dental practices. Br Den J, 7 (2021) 1–7.

H. Matar, S.C. Price, R.P. Chilcott, Further studies of the efficacy of military, commercial and novel skin decontaminants against the chemical warfare agents sulphur Mustard, Soman and VX, Toxicol In Vitro, 54 (2019) 263-268.

H. Matar, A. Pinhal, N. Amer, M. Barrett, E. Thomas, P. Hughes, J. Larner, R.P. Chilcott, Decontamination and management of contaminated hair following a CBRN incident, Toxicol Sci, 171 (2019) 269-279.

J. Larner, A. Durrant, P. Hughes, D. Mahalingam, S. Rivers, H. Matar, E. Thomas, M. Barrett, A. Pinhal, N. Amer, C. Hall, T. Jackson, V. Catalani, R.P. Chilcott, Efficacy of Different Hair and Skin Decontamination Strategies with Identification of Associated Hazards to First Responders, Prehosp Emerg Care, (2019) 1-14.

R.P. Chilcott, J. Larner, H. Matar, UK's initial operational response and specialist operational response to CBRN and HazMat incidents: a primer on decontamination protocols for healthcare professionals, Emerg Med J, 36 (2019) 117-123.

R.P. Chilcott, J. Larner, A. Durrant, P. Hughes, D. Mahalingam, S. Rivers, E. Thomas, N. Amer, M. Barrett, H. Matar, A. Pinhal, T. Jackson, K. McCarthy-Barnett, J. Reppucci, Evaluation of US Federal Guidelines (Primary Response Incident Scene Management [PRISM]) for Mass Decontamination of Casualties During the Initial Operational Response to a Chemical Incident, Ann Emerg Med, 73 (2019) 671-684.

S.S. Shetage, M.J. Traynor, M.B. Brown, R.P. Chilcott, Sebomic identification of sex- and ethnicity-specific variations in residual skin surface components (RSSC) for bio-monitoring or forensic applications, Lipids Health Dis, 17 (2018) 194-194.

H. Matar, N. Amer, S. Kansagra, A. Pinhal, E. Thomas, S. Townend, J. Larner, R.P. Chilcott, Hybrid in vitro diffusion cell for simultaneous evaluation of hair and skin decontamination: temporal distribution of chemical contaminants, Sci Rep, 8 (2018) 16906-16906.

H. Lydon, C. Hall, H. Matar, C. Dalton, J.K. Chipman, J.S. Graham, R.P. Chilcott, The percutaneous toxicokinetics of VX in a damaged skin porcine model and the evaluation of WoundStat™ as a topical decontaminant, J Appl Toxicol, 38 (2018) 318-328.

C.A. Hall, R.P. Chilcott, Eyeing up the Future of the Pupillary Light Reflex in Neurodiagnostics, Diagnostics (Basel), 8 (2018) 19.

C. Dalton, C. Hall, H. Lydon, J. Jenner, J.K. Chipman, J.S. Graham, R.P. Chilcott, The percutaneous absorption of soman in a damaged skin porcine model and the evaluation of WoundStat™ as a topical decontaminant, Cutan Ocul Toxicol, 37 (2018) 172-179.

R.P. Chilcott, H. Mitchell, H. Matar, Optimization of Nonambulant Mass Casualty Decontamination Protocols as Part of an Initial or Specialist Operational Response to Chemical Incidents, Prehosp Emerg Care, (2018) 1-12.

S.S. Shetage, M.J. Traynor, M.B. Brown, T.M. Galliford, R.P. Chilcott, Application of sebomics for the analysis of residual skin surface components to detect potential biomarkers of type-1 diabetes mellitus, Sci Rep, 7 (2017) 8999-8999.

H. Matar, J. Larner, V. Viegas, S. Kansagra, K.L. Atkinson, S. Shetage, J.T. Skamarauskas, B. Theivendran, V.S. Goldman, R.P. Chilcott, Evaluation of a new topical skin protectant (RD1433) for the prevention and treatment of incontinence-associated dermatitis, Cutan Ocul Toxicol, 36 (2017) 211-219.

H.L. Lydon, C.A. Hall, C.H. Dalton, J.K. Chipman, J.S. Graham, R.P. Chilcott, Development of haemostatic decontaminants for treatment of wounds contaminated with chemical warfare agents. 3: Evaluation of in vitro topical decontamination efficacy using damaged skin, J Appl Toxicol, 37 (2017) 976-984.

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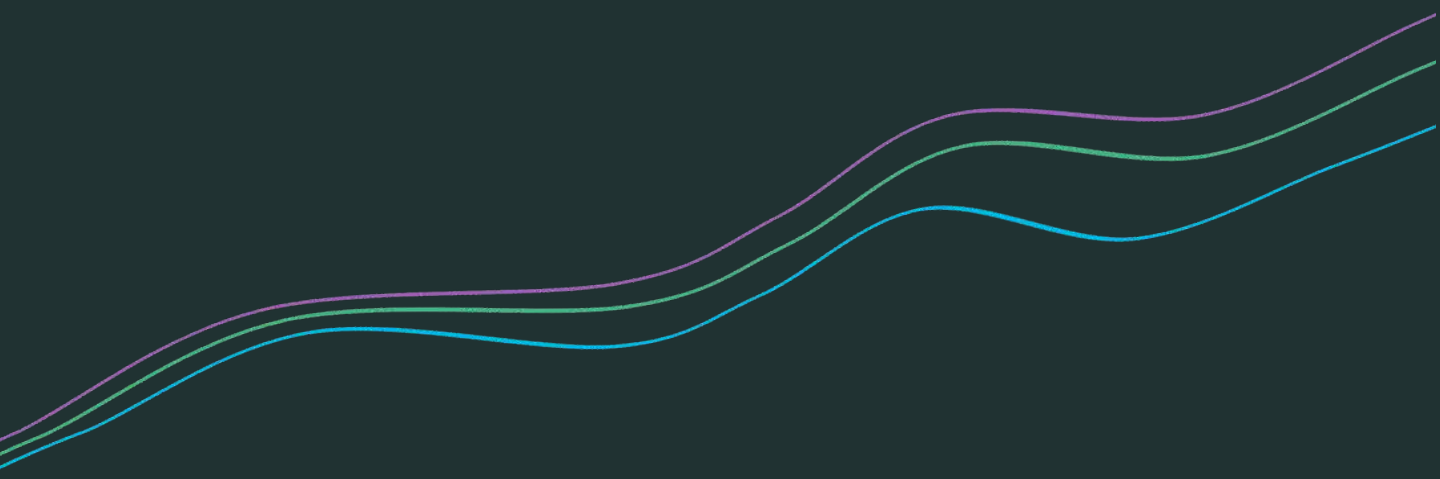

The Toxicology Research Group (TRG) is an innovative, multidisciplinary, award-winning centre of excellence for the research, development, evaluation & testing of CBRNe countermeasures in the areas of protection, detection, decontamination, medical diagnostics and forensic chemical analysis. Launched in 2012, the TRG has established a track record of success in delivering projects to time, cost and high quality. An ongoing programme of in-house R&D provides cutting-edge knowledge and expertise which underpins our ability to offer bespoke, cost-effective studies for our clients. Our work is performed at a secure, off-campus location supported by state-of-the-art laboratories and equipment under a quality management system certified by Lloyd's Register to ISO 9001:2015.

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