**Curriculum Vitae**

**Dr Paul Fowler**

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#### “A highly motivated and experienced genetic toxicologist with a desire to see practical application of alternative approaches to human safety assessment”

#### EDUCATION AND QUALIFICATIONS

**Ph.D. Molecular Genetic Toxicology - 2000-2004**

**Title:** **“Biological relevance of clastogens active at high and low toxicity”**

University of Wales Swansea Supervisor – Prof J.M.Parry

Sponsors: BBSRC CASE studentship

in conjunction with Unilever PLC

**BSc (Hons) Biological Sciences 1996 – 2000**

Coventry University First Class Degree

#### EMPLOYMENT HISTORY

**Previous Employment:**

**Unilever Safety and Environmental Assurance Centre (SEAC) December 2014 – October 2017**

Endpoint expert for genetic toxicity and cancer providing advice to diverse business areas on safety strategies for cancer risk assessment including novel foods, personal and home care products. Also working on exposure based risk assessment paradigms and mechanistic investigation of DNA damage.

Project leader within Unilever Safety and Environmental Assurance Centre (SEAC)

leading a science & technology project based around risk assessment of inhalable bio-persistent materials. The project aimed to deliver better *in vitro* models of the human airway utilising differentiated bronchial and small airway epithelium as well as collaborating with university departments towards a model with immune function (macrophage and dendritic cells).

Also responsible for the strategy and direction of the biological aspects of a chemistry based project anchoring molecular initiating events into organ level toxicity. The project investigated the use of 3D organoid models for predicting toxicity based on changes to the transcriptome and proteome after chemical treatment.

**Unilever SEAC, October 2011 – December 2014**

Risk assessor within the genetic toxicology group in Unilever providing expert support to various business categories regarding genotoxicity/carcinogenicity. Additionally, worked on a mechanistic approach to DNA damage assessment based around p53 involving the use of various markers of DNA damage/repair such as histone phosphorylation (repair foci), Comet assay, Genomic and proteomic approaches.

**Covance, Harrogate February 2010 – September 2011**
Manager and scientific lead of the genetic and molecular Toxicology research group. The group contained three post doctoral scientists, one part time PhD student/researcher, laboratory manager and two technical assistants.

The scope of the group was to develop and promote scientific excellence within the department through small in house validation and development exercises and external projects for clients or research bodies.

In addition, I also supervised two part time PhD students and have been involved with various MSc and degree projects.

**Covance, Harrogate November 2007- February 2010**Post Doctoral researcher/Project Manager for three-year project, sponsored by Cosmetics Europe (formerly COLIPA), the European cosmetics trade association, designed to investigate and reduce the frequency of false positive results arising within *in vitro* genetic toxicology assays.

**Covance, Harrogate October 2005- November 2007**From October 2005 until November 2007 I was employed as a Study Director within the genetic and molecular toxicology group at Covance. I was responsible for the conduct of both regulatory and non-regulatory genetic toxicology studies including the following study types:

* In Vitro Cytogenetics, including Micronucleus and Chromosome Aberration assays
* Cytotoxicity assessments, Neutral red uptake assays and phototoxicity assays
* “non regulatory”, screening assessments, and non standard investigative experiments including chromosome copy number assessment (FISH), gene expression and germ cell aneuploidy assessments as well as in house research projects.

**Health Protection Agency, Chemical Hazards and Poisons division, Harwell October 2004- October 2005**

Employed by the Health Protection Agency, in collaboration with the National Radiological Protection Board, for a postdoctoral position investigating biomarkers of chromosome damage after exposure to various environmental and industrial chemicals.

#### SKILLS AND EXPERIENCE

**Teaching and presentation skills:**

* Presenting at both National and International Conferences, posters and oral presentations.
* Supervision of Ph.D. students
* Lecturer and exam board member for Nanohealth MSc at Swansea University 2010-current
* Regular reviewer for Mutation Research, Environmental and Molecular Mutagenesis and Toxicology in vitro amongst others.

**Membership of Professional Organizations:**

United Kingdom Environmental Mutagen Society.

European Environmental Mutagen Society (Secretary 2009-2011)

Industrial Genotoxicity Group (Committee member 2010-2013) Secretary (2012-2014)

Cosmetics Europe genetic toxicology task force member.

In Vitro Toxicology Society (IVTS) Committee member (joined 2017)

**Outside work interests:**

Member of Raunds community first response group (level 3 FPOS)

##### PUBLICATIONS

*The utility of the in vitro micronucleus test for evaluating the genotoxicity of natural and manmade nano-scale fibres*

**Mutation Research - Genetic Toxicology and Environmental Mutagenesis (2016), 809, pp. 33-42**

Paul Fowler, Andrew Homan, Derek Atkins, James Whitwell, Melvyn Lloyd and Roberta Bradford

*A comparison of the genotoxicity of benzo[a]pyrene in four cell lines with differing metabolic capacity*

**Mutation Research - Genetic Toxicology and Environmental Mutagenesis (2016), 808, pp. 8-19.**

Shah, U.-K., Seager, A.L., Fowler, P., Doak, S.H., Johnson, G.E., Scott, S.J., Scott, A.D., Jenkins, G.J.S.

The 3Rs as a framework to support a 21st century approach for nanosafety assessment

**Nano Today, (2015), 12, pp. 1-13.**

Burden, N., Aschberger, K., Chaudhry, Q., Clift, M.J.D., Doak, S.H., Fowler, P., Johnston, H., Landsiedel, R., Rowland, J., Stone, V.

*Implementing Toxicity Testing in the 21st Century (TT21C): Making safety decisions using toxicity pathways, and progress in a prototype risk assessment*

**Toxicology (2015), 332, pp. 102-111.**

Adeleye, Y., Andersen, M., Clewell, R., Davies, M., Dent, M., Edwards, S., Fowler, P., Malcomber, S., Nicol, B., Scott, A., Scott, S., Sun, B., Westmoreland, C., White, A., Zhang, Q., Carmichael, P.L.

*Stem cell-derived systems in toxicology assessment*

**Stem Cells and Development (2015), 24 (11), pp. 1284-1296**

Suter-Dick, L., Alves, P.M., Blaauboer, B.J., Bremm, K.-D., Brito, C., Coecke, S., Flick,., Fowler, P., Hescheler, J., Ingelman-Sundberg, M., Jennings, P., Kelm, J.M., Manou, I., Mistry, P., Moretto, A., Roth, A., Stedman, D., Van De Water, B., Beilmann, M.

*Where will genetic toxicology testing be in 30 years' time? Summary report of the 25th Industrial Genotoxicity Group Meeting, Royal Society of Medicine, London, November 9, 2011*

**Mutagenesis (2014), 29 (1), pp. 73-77.**

Ellis, P., Fowler, P., Booth, E., Kidd, D., Howe, J., Doherty, A., Scott, A.

 *Reduction of misleading (“false”) positive results in mammalian cell genotoxicity assays. I. Choice of cell type*

**Mutation Research 742** (2012) 11– 25

Paul Fowler, Katie Smith, Jamie Young, Laura Jeffrey, David Kirkland, Stefan Pfuhler and Paul Carmichael

*Reduction of misleading (“false”) positive results in mammalian cell genotoxicity assays. II. Importance of toxicity measure*

**Mutation Research 747** (2012) 104-117

Paul Fowler, Katie Smith, Jamie Young, Laura Jeffrey, David Kirkland, Stefan Pfuhler and Paul Carmichael

# *Reduction of misleading (“false”) positives in mammalian cell genotoxicity assays.III Sensitivity of human cell types to known genotoxic agents* Mutation Research 767 (2014) 28-36

**Paul Fowler**, Katie Smith, Jamie Young, Laura Jeffrey, David Kirkland, Stefan Pfuhler and Paul Carmichael

*In vitro genotoxicity test approaches with better predictivity: Summary of an IWGT workshop*

**Mutation Research 723**(2011) 101–107

Stefan Pfuhler, Mick Fellows, Jan van Benthem, Raffaella Corvi, Rodger Curren,

Kerry Deareld, Paul Fowler, Roland Frötschl, Azeddine Elhajouji, Ludovic Le Hégarat,

Toshio Kasamatsu, Hajime Kojima, Gladys Ouédraogo, Andrew Scott, Günter Speit*.*

*Cadmium chloride, benzo[a]pyrene and cyclophosphamide tested in the in vitro mammalian cell micronucleus test (MNvit) in the human lymphoblastoid cell line TK6 at Covance laboratories, Harrogate UK in support of OECD draft Test Guideline 487*

**Mutation Research 2010,** 702, **2,** 171-174

Paul Fowler, James Whitwell, Laura Jeffrey, Jamie Young, Katie Smith and David Kirkland

*Etoposide, colchicine, mitomycin C and cyclophosphamide tested in the in vitro mammalian cell micronucleus test (MNvit) in Chinese hamster lung (CHL) cells at Covance laboratories, Harrogate UK in support of OECD draft Test Guideline 487*

**Mutation Research 2010,** 702, **2,** 175-180

Paul Fowler, James Whitwell, Laura Jeffrey, Jamie Young, Katie Smith and David Kirkland

*5-Fluorouracil, colchicine, benzo[a]pyrene and cytosine arabinoside tested in the in vitro mammalian cell micronucleus test (MNvit) in Chinese hamster V79 cells at Covance Laboratories, Harrogate, UK in support of OECD draft Test Guideline 487*

**Mutation Research 2010,** 702, **2,** 230-236

James Whitwell, Paul Fowler, Sarah Allars, Karen Jenner, Melvyn Lloyd, Debbie Wood, Katie Smith, Jamie Young, Laura Jeffrey, David Kirkland,

*2-Aminoanthracine, 5-fluorouracil, colchicine, benzo[a]pyrene, cadmium chloride and cytosine arabinoside tested in the in vitro mammalian cell micronucleus test (MNvit) in Chinese hamster ovary (CHO) cells at Covance Laboratories, Harrogate UK in support of OECD draft Test Guideline 487*

**Mutation Research 2010,** 702, **2,** 237-247

James Whitwell, Paul Fowler, Sarah Allars, Karen Jenner, Melvyn Lloyd, Debbie Wood, Katie Smith, Jamie Young, Laura Jeffrey, David Kirkland

*Further analysis of Ames-negative rodent carcinogens that are only genotoxic in mammalian cells at concentrations exceeding 1 mM, including retesting of compounds of concern*

**Mutagenesis 2010,** 25, **6,** 539-553

David Kirkland and Paul Fowler

*Flourescence in situ hybridisation analysis of chromosomal aberrations in gastric tissue: the potential involvement of Helicobacter pylori.*

# British Journal of Cancer 2005 92, 1759-1766

Williams L., Jenkins G.J.S., Doak S.H., Fowler P., Parry E.M., Brown T.H., Griffiths A.P., Williams J.G., Parry J.M.

*Investigations into the biological relevance of in-vitro clastogenic and aneugenic activity.* **Cytogenetic and Genome Research** special issue 2004 **104**, 283-8.

Parry, J., Fowler, P., Parry, E., Quick, E.

**Invited presentations**

*The biological significance of high and low toxicity genotoxins*

Invited speaker at Industrial Genotoxicity Group meeting 2003

*Reduction of false positives in in vitro genetic toxicology testing: the importance of accurate toxicity measurements*

Invited speaker at European Environmental Mutagen Society, Croatia Sept 2008

*COLIPA funded activities at Covance: Reduction of false positives in in vitro genetic toxicology testing*

Invited speaker at Industrial Genotoxicity Group meeting 2008

*Reduction of false positives in in vitro genetic toxicology testing: the importance of accurate toxicity measurements*

Invited speaker at Covance sponsored seminar, London 2008

*Reduction of False Positives in in-vitro genetic toxicology testing: Importance of cell selection and toxicity measure*

Invited speaker at 5th international workshop on genotoxicity testing (IWGT), Basel 2009

*COLIPA funded activities to reduce false positive – update from IGG Nov 2008 talk and Basel IWGT 2009*

Invited speaker at Industrial Genotoxicity Group meeting 2009

*Reduction of misleading (“false”) positive results in mammalian cell genotoxicity assays: Choice of cell type*

Invited speaker at European Environmental Mutagen Society, Oslo Sept 2010

*Exposure and mechanistic based genetic toxicology risk assessment without animal data*. Invited speaker at EMGS meeting Monterrey 2013

*A Perspective on the Contributions of EMGS to the Quantification of Genomic Damage Induced by Exposure to Environmental Mutagens and the Development of Risk Assessment Strategies for Human Health -* ***Potential Utility of Point of departure data in exposure driven cancer risk assessment:*** Invited speaker at EMGS meeting Orlando 2014

*Towards an AOP based risk assessment for Lung Fibrosis*: invited speaker at the IGG annual meeting London 2016