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Negative data is still useful data: investigating and detecting non-genotoxic carcinogens *in vitro*.

Demi Pritchard, Gareth Jenkins

822839@swansea.ac.uk
Swansea University, S. Wales

Approximately, 70-90% of human cancers are induced due to chronic environmental agent exposure. Carcinogens are split into two main groups, genotoxic carcinogens (GC) and non-genotoxic carcinogens (NGC). Where Genotoxic carcinogens act directly on the DNA and non-genotoxic carcinogens use alternative mechanisms to initiate oncogenesis. Currently there are no validated in vitro testing systems for NGCs and due to their complex nature they are largely ignored.

Our *in vitro* testing battery consists of a series of endpoints, trying to unpick the mechanism of action(s) (MOA) utilised by different NGCs. Both the acute and chronic micronucleus (Mn) assays were carried out as well as tests for reactive oxygen species, cell cycle, apoptosis, mitochondrial health and gene expression profiling. Not all NGCs are subject to the current 2 year rodent bioassay, which means some NGCs may slip through the net of testing.

In order to try to understand the complexities of NGCs, a battery of tests investigating MOAs are required. A number of chemicals were subject to this in vitro testing battery however not all of them gave positive results to these assays. The endpoints assessed were traditional acute dosing compared with more human relevant chronic exposures, Micronuclei induction, cytotoxicity, cell cycle perturbations, Reactive oxygen species (ROS) levels, mitochondrial function via a mito stress test and gene expression through a PCR array. The chemicals that gave negative results in these endpoints were: TCDD, rosuvastatin and chloroprene.

Overall, the test battery was successful in unpicking the MOAs used by some NGCs but not all. It was valuable to subject all NGCs to the same tests as it allows for contrasts and comparisons to be made between the differing carcinogens. Future work should have an increased focus on gene expression.