

<p><b>Equipment Name: Equipment for measuring behavioural toxicity and gene expression in invertebrates</b></p>	<p><b>Category: D. Particle Exposure Assessment</b>  <b>Institute: University of Leeds</b>  <b>Location: Leeds</b>  <b>Contact Details of Technology Expert:</b>  <b>Name, Prof. R.E. Isaac</b>  <b>Phone, +44 1133 432903</b>  <b>Fax, +44 1133 432835</b>  <b>E-mail r.e.isaac@leeds.ac.uk</b></p>
<p><b>Short technology description/Overview:</b></p> <p>Measurement of the dose-dependent effects of ENMs on reproduction, sensory nervous system, neuromuscular activity, learning and memory, sleep, oxidative stress and lifespan can be determined using locomotor activity monitors and automated video recording and analysis of animal behaviour and confocal microscopy for analysis of changes in GFP expression resulting from exposure to ENMs.</p> <p>Options for QNano TA:</p> <ol style="list-style-type: none"> <li>1. Exposure is performed as part of the TA and selected (pre-specified) end-points are assessed on site</li> <li>2. Exposure is performed at home institute and samples are prepared for analysis as per Standard Operating Procedures (SOPs) provided by Prof. Isaac.</li> </ol> <p><b>Specific considerations for experiments with nanoparticles:</b></p> <p>Need to ensure statistically relevant number of samples (Prof. Isaac will advise on this during proposal preparation)</p> <p>Need to include appropriate controls, nanoparticle and / or chemical</p>	
<p><b>Main Features (Equipment Capabilities):</b></p> <ul style="list-style-type: none"> <li>▪ Behaviour monitoring equipment for invertebrates</li> <li>▪ Image capture for quantifying gene expression</li> <li>▪ Software for statistical analysis</li> </ul>	
<p><b>Typical Samples &amp; Images:</b></p> <p>Effect of drugs on night time sleep in the fruitfly <i>Drosophila melanogaster</i>. <b>Carhan, A., Tang, K., Shirras, C. A., Shirras, A. D. and Isaac, R. E.</b> (2011). Loss of Angiotensin-converting enzyme-related (ACER) peptidase disrupts night-time sleep in adult <i>Drosophila melanogaster</i>. <i>J Exp Biol</i> <b>214</b>, 680-6.</p> <p>(B) Effect of Cd quantum dots on gene expression in the nematode <i>Caenorhabditis elegans</i> <b>Boyd, W. A., McBride, S. J., Rice, J. R., Snyder, D. W. and Freedman, J. H.</b> (2010). A high-throughput method for assessing chemical toxicity using a <i>Caenorhabditis elegans</i> reproduction assay. <i>Toxicol Appl Pharmacol</i> <b>245</b>, 153-9.</p>	

