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Letter to the editor

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In the article *Non-toxic thermotropic liquid crystals for use with mammalian cells* Luk *et al.* [1] present data on cytotoxicity of different liquid crystal mixtures. The aim was to identify liquid crystals that are not toxic to mammalian cells.

The authors exposed mammalian cells (3T3 fibroblasts and SV-40 transformed human corneal epithelial cells) to eight different liquid crystal mixtures. Viability and death of the cells was assessed after immersion of the cells in the liquid crystals. Cytotoxicity was observed for five liquid crystal mixtures after 4 h of exposure. However, the testing procedure used by the authors does not follow the prevailing standards for cytotoxicity testing [2]. In standard tests for the assessment of cytotoxicity, the test substances are dissolved in the cell culture medium at defined concentrations. This mixture is then added to the cells maintaining nutritional supply and homeostasis of the cells. This study design prevents cell death due to technical reasons (e.g. lack of nutrients, change in osmolality or pH); the observed effects can directly be correlated to test substance concentrations and erroneous results are avoided.

Complete replacement of the culture medium as reported by Luk *et al.* [1] deprives the cells of nutrients needed for survival which becomes evident after 6 h of exposure to pure PBS buffer [3]. But moreover, complete replacement of the medium by undiluted test compound (i.e. liquid crystal mixture) additionally results in the loss of homeostasis due to an altered and non-physiological environment for the cells. Changes in osmolality (osmotic pressure) and medium pH inevitably lead to a loss of cell viability and subsequently to artifactually increased cell death. Thus, osmolality and pH of the medium should be confirmed to be in the physiological range (e.g. 300 ± 20 mOsm and pH 7.0 ± 0.4) during the study [4, 5].

Because no adjustment of the media with respect to osmolality and pH was made, the results are not indicative of an inherent cytotoxicity of the test compounds as suggested in the article.

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