Validation Progress of the LUMI-CELLä ER Recombinant Bioassay for Rapid Evaluation of Chemicals for Potential Estrogenic Activity

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The association between the exposure and bioaccumulation of endocrine disruptor chemicals (EDCs) and their adverse effects on human and wild life populations has raised concern worldwide. Due to these detrimental effects there is an obvious need to develop a relevant bioassay, which can both detect these chemicals, as well as provide a relevant estimate of their endocrine disrupting potency. In order to detect EDCs using a high-throughput bioassay system, Xenobiotics Detection System (XDS) Inc. developed the LUMI-CELL™ ER bioassay. BG-1 cells were stably transfected with an estrogen-responsive luciferase reporter gene plasmid (pGudLuc7ere). The resulting cell line responds to estrogenic chemicals in a time-, dose dependent- and chemical-specific manner with the induction of luciferase gene expression. XDS's LUMI-CELL™ ER bioassay system tested 110 chemicals, 53 of these chemicals were recommended by ICCVAM for validation of ER binding assay. Of the 110 chemicals tested by LUMI-CELL™ ER, 69 demonstrated estrogenic activity, while 41 showed no activity. All of the 28 chemicals tested, which were recommended by ICCVAM for validation, demonstrated estrogenic activity. Of the 57 chemicals tested, which were not included in the ICCVAM requirements for validation, 41 were active and 17 showed no activity. This data clearly demonstrates that XDS's LUMI-CELL™ ER high-throughput bioassay system is a fast, reliable, and relatively inexpensive method for detection of environmental EDCs, meeting many of the requirements mandated by the EPA and ICCVAM's Tier I (screening) requirements for EDC detection assays.

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