

Dual-color fluorescent imaging of developmental shift from foetal hepatic cells to adult hepatocytes and CYP3A4 induction test in human hepatic carcinoma HepaRG

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Human adult hepatocytes are required for cell-based assays to evaluate the potential risk of drug-drug interactions caused by the transcriptional induction of P450 (CYP) enzymes in early-phase drug discovery and development. We created transgenic HepaRG cells by replacing the protein-coding regions of human CYP3A4 and CYP3A7 with enhanced green fluorescent protein (EGFP) and DsRed reporters, respectively, in a bacterial artificial chromosome (BAC) vector that included whole regulatory elements. In the created BAC-transgenic HepaRG cells, EGFP can be used as a quality assurance marker for identifying functional hepatocytes derived from DsRed-positive bipotential stem cells in real time without the need for many time-consuming steps.