The Regulation of Barbiturate-mediated Induction of CYP 102 by Xeno- and Phytoestrogens : "Possible intersection of signalling pathways in primitive systems "

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Cytochrome P450 102 (CYP102 or Cytochrome $P450_{BM-3}$) is induced in *Bacillus megaterium* by barbiturates, perioxisome proliferators, and non-steroidal anti-inflammatory drugs. We have previously demonstrated that a CYP102 construct (BMC 143) coupled with a luciferase reporter gene can be used to identify the inducers of CYP 102. The regulation of barbiturate mediated induction of P450 is best understood in bacteria and the evidence suggests that the aspects of bacterial phenobarbital (PB) induction mechanism are conserved in mammals. We now describe the effects of added xeno- and phytochemicals on the induction of CYP102 by PB in *Bacillus megaterium.*

Estrogen, 17-β-estradiol (E2) and xenoestrogens like 4-sec-butyl phenol (4-sBP) increase the induction of CYP102 by PB. The phytochemicals like genistein (GEN), biochanin A (BIOA), coumestrol (CMST) and mycotoxins like zearalenone (ZEAR inhibit the induction of CYP 102 by PB. The CYP 102 gene is also modulated by oxidative stress, however added H_2O_2 decreases the extent of induction by PB in a dose dependent manner.

The effects of these chemicals in combination with E2, 4sBP and PB suggest that such effects may be conserved through evolution and that there are common denominators in the regulation of gene expression by signalling molecule.

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