



三丁基锡对热带爪蟾蝌蚪甲调基因mRNA表达的影响

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Effects of tributyltin on mRNA expressions of thyroid hormone response genes in *Xenopus tropicalis* tadpoles

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摘要 用三丁基锡(TBT)对热带爪蟾(*Xenopus tropicalis*)NF51阶段蝌蚪进行48 h和96 h暴露.结果显示,50 ng · L⁻¹和200 ng · L⁻¹ TBTCI暴露对胚胎的存活率没有影响.50 ng · L⁻¹ TBTCI暴露组TRβ和DI3 mRNA在蝌蚪尾巴中的表达比对照组增加了1~2.3倍.200 ng · L⁻¹ TBTCI暴露组48 h时, TSHβ mRNA在蝌蚪尾巴中的表达比对照组上调了2.0倍.96 h后, TBTCI暴露组的RXRα mRNA在脑和尾中的表达均比对照组减少了约0.4倍, 而RXRβ mRNA在尾巴中的表达上调了5.9倍.96 h后, 50 ng · L⁻¹ TBT暴露组MCT8 mRNA在尾部的表达上调了3.2倍, 而200 ng · L⁻¹组在脑部的表达是对照组的0.23倍.PPARγ mRNA在TBTCI暴露组蝌蚪脑和尾中的表达均比对照组增加了1~2倍.上述结果表明, TBT能引起蝌蚪多个甲调基因mRNA表达的变化, 并具有明显的组织差异性.这些mRNA涉及到甲状腺激素的合成、运输、转化和作用等多个过程, 表明TBT对爪蟾具有甲状腺激素干扰效应.同时, 通过对一些相关mRNA的检测表明, TBT可能通过与维甲酸核受体(RXR)结合而对蝌蚪产生甲状腺激素干扰效应.由此可见, 分子指标在筛选甲状腺激素干扰物的过程中不仅具有快速灵敏的特点, 而且有助于解析污染物的致毒作用模式.

关键词: 爪蟾 TBT 甲调基因表达

Abstract: *Xenopus tropicalis* tadpoles (NF51) were exposed to TBT for 48 and 96 h, respectively. Exposures to 50 and 200 ng · L⁻¹ TBTCI showed no effects on the survival rate of tadpoles. The expression of TRβ and DI3 mRNA were significantly increased in the tails by 1~2.3 fold in the groups treated with 50 ng · L⁻¹ TBTCI. The expression of TSHβ mRNA was increased in the tails by 2 fold after 48 h of exposure. RXRα mRNA was decreased by 0.4 fold in the brains and tails, and RXRβ mRNA was increased by 5.9 fold in the tails after 96 h of exposure. MCT8 mRNA was increased by nearly 3 fold in the tails in 50 ng · L⁻¹ TBT treatment group and decreased by 3 fold or so in the brains in 50 ng · L⁻¹ TBT treatment group after 96 h of exposure. These results suggest that TBT can result in the changes of multiple mRNA expressions and show high tissue-specific differences. These mRNA are involved in the synthesis, transportations, transformations and actions, which indicate that TBT shows thyroid hormone disrupting effects. The changes of related mRNA expressions indicate that TBT might disrupt the thyroid hormone system of tadpoles by binding with retinoid X receptor. Therefore, biomarkers are not only cost-effective and sensitive endpoints in screening the thyroid disrupting chemicals but also useful in identifying the mode of action of contaminants.

Key words: *Xenopus tropicalis* TBT thyroid hormone response genes expressions

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