

综述

神经发育毒性动物实验替代方法研究进展

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摘要 胚胎早期暴露于某些工业化学物中, 即使是很小剂量, 也可导致胚胎脑损伤, 引起神经发育性疾病和亚临床脑功能不良。虽然化学物基于动物毒性实验的安全性评价是较可靠的, 但这种方法耗时长、成本高, 而且不符合目前减少实验动物使用的趋势, 因此神经发育毒性 (DNT) 实验的替代模型逐步引起重视。为建立和完善快速、经济又可高通量筛选受试物的替代方法, 本文分别介绍了体外细胞模型和非哺乳动物模型的优势、现阶段应用以及所面临的挑战。这些替代法虽不能完全取代包括哺乳动物在内的体内实验, 但它们在区分化合物和识别DNT机制方面将发挥巨大的作用。

关键词 [发育障碍](#) [动物替代实验](#) [模型](#), [神经学](#) [细胞](#), [非哺乳动物](#)

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Progress in alternatives for developmental neurotoxicity testing on animals

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Abstract

Industrial chemical exposure during early embryonic development can cause fetal brain damage, such as neurodevelopmental disorders and sub-clinical brain dysfunction. Although the safety evaluation of chemicals based on animal toxicity tests is relatively reliable, many of these tests are expensive in terms of scientific resource and time and do not fit in with the current trend of reduced use of laboratory animals. As a result, alternatives for developmental neurotoxicity(DNT) testing attract more attention. The paper reviews establishment and improvement of alternatives, including sensitivity, low consumption and adaptability to high throughput screening, advantages, and current applications of cell-based models and non-mammalian models and finally the challenges existing. The alternatives will not completely replace a paradigm that involves *in vivo* testing in mammals, but they will be of great value in prioritizing chemicals and in identifying mechanisms of DNT.

Key words [developmental disabilities](#) [animal testing alternatives](#) [models](#) [neurological](#) [cell](#) [non-mammalian models](#)

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