

论文

光纤化学传感器在线监测家兔体内阿霉素血药浓度

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摘要:

目的将光纤化学传感器作为一种新的获取分析物信息的方法,用于体内药物过程监测。方法应用溶胶凝胶法将D-70分子探针固定于光纤裸露端面,利用阿霉素对探针的荧光猝灭效应检测其浓度变化;同时设计了简便可行的动物模型,使光纤探头可以直接插入血管进行检测。结果该方法的回收率为99.4%~106.2%,日内及日间RSD分别为6.6%~11.4%和5.9%~11.7%,当信噪比为3时,检出限为0.057 μg·mL<sup>-1</sup>。结论此法简便,提高了分析对象的检测灵敏度,为在线在位监测其他生物体液中药物浓度及药物在生物体组织器官中的分布代谢提供了可以借鉴的新方法和新技术。

关键词: 光纤化学传感器 药物过程监测 阿霉素

CONTINUOUS MONITORING OF BLOOD ADRIAMYCIN USING A FIBER OPTIC CHEMICAL SENSOR IN RABBIT

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Abstract:

AIMTo evaluate the feasibility and accuracy of continuous monitoring of drug with a fiber optic chemical sensor (FOCS) in animal. METHODSAn accurate optical design was used to enhance the intensity of light from a 100-micron optic fiber and the fluorescence signal could be detected. A new sol-gel method was used to fix the fluorescence substance 4-(N,N-dioctyl)amino-7-nitrobenz-2-oxa-1,3-diazole (D-70) on the body fiber. The vary quenching means the vary of the concentration of adriamycin (ADM) in rabbit blood. ADM was determined by FOCS based on the fluorescence multiple quenching. In a simple animal model, the carotid artery was catheterized with a cannula, housing a 100-micron optic fiber. RESULTSThe recovery of ADM was 99.4%~106.2%,the within-run and between-run RSDs were 6.6%~11.4% and 5.9%~11.7% respectively. The method permitted detection limits as low as 0.057 μg·mL<sup>-1</sup> at a signal-to-noise ratio of 3. CONCLUSIONFiber-optic chemical sensor is potentially useful for monitoring blood drug in biomedical field.

Keywords: drug process monitor adriamycin fiber optic chemical sensor

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