

论文

SOD酶生物传感器筛选清除超氧阴离子自由基的活性物

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摘要:

目的制备超氧化物歧化酶传感器, 建立清除氧自由基药物的体外筛选方法。方法将固定化铜锌超氧化物歧化酶与光纤氧传感器通过特定装置组装为酶传感器。以邻苯三酚的自氧化作为超氧阴离子的发生源, 预置的固定化酶响应为内标, 以已知有氧自由基清除作用的Vit C为阳性对照, 验证测定方法; 通过对比加入样品前后邻苯三酚自氧化速度的变化情况考察样品清除超氧阴离子自由基能力。结果酶传感器检测限为7.0 U, 使用寿命大于2周。以本传感器对15种样品进行了体外清除氧自由基活性实验, 分别验证和发现了部分样品的清除活性。结论所研制的传感器信号稳定性较好, 测定方法简便、快速, 能直观地获得氧自由基清除的动力学信息, 可用于大量药物的体外初筛实验。

关键词: 超氧化物歧化酶; 光纤氧传感器; 生物传感器; 超氧阴离子

Superoxide dismutase biosensor for screening substances possessing scavenging superoxide anion activity

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Abstract:

AimTo establish a method for screening active substance with scavenging effects on superoxide anion *in vitro* by designed superoxide dismutase biosensor. MethodsThe enzyme sensor was built by connecting the immobilized CuZnSOD with optical oxygen sensor through a special way. Superoxide anions were generated by auto-oxidation of pyrogallol. The auto-oxidation speed was examined before and after adding samples into the system, and the Vit C having the scavenging radical activities was served as a positive control. ResultsThe limit of biosensor detection was 7.0 U in activity, and lifetime of the immobilized enzyme in the reaction-cell was above 2 weeks. The scavenging effects on superoxide radicals of fifteen active substance were studied *in vitro* by the sensor, and some of them presented scavenging activities. ConclusionThe signal from biosensor is stable, easy to be determined, and the kinetic information on scavenging superoxide radicals could be obtained directly. The biosensor system can be used for screening drugs simply and rapidly.

Keywords: optical fiber oxygen sensor biosensor superoxide anion superoxide dismutase

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