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## 聚乳酸-羟基乙酸共聚物包裹Gd-DTPA微球的弛豫性能和体外释放规律

### Relaxation properties and in vitro release law of Gd-DTPA-loaded poly(lactic acid glycolic acid) microspheres

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中文关键词: [聚乳酸-羟基乙酸共聚物](#) [钆DTPA](#) [弛豫性能](#) [磁共振成像](#) [对比剂](#)

英文关键词: [Poly\(lactic acid glycolic acid\)](#) [Gadolinium DTPA](#) [Relaxation properties](#) [Magnetic resonance imaging](#) [Contrast media](#)

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作者	单位	E-mail
<a href="#">鄢雄</a>	<a href="#">重庆医科大学附属第二医院放射科,重庆 400010</a>	
<a href="#">郭大静</a>	<a href="#">重庆医科大学附属第二医院放射科,重庆 400010</a>	<a href="mailto:guodj@163.com">guodj@163.com</a>
<a href="#">余聪</a>	<a href="#">重庆医科大学附属第二医院放射科,重庆 400010</a>	
<a href="#">王志刚</a>	<a href="#">重庆医科大学超声影像学研究所,重庆 400010</a>	
<a href="#">敖梦</a>	<a href="#">重庆医科大学超声影像学研究所,重庆 400010</a>	

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中文摘要:

目的 制备聚乳酸-羟基乙酸共聚物(PLGA)包裹Gd-DTPA微球制成Gd-PLGA,观察其弛豫性能、体外释放规律,为构建靶向MR分子探针打下基础。方法 采用乳化溶剂蒸发法(水/油/水)制备Gd-PLGA,高效液相色谱法测定Gd-DTPA含量,以离心法测量Gd-PLGA微球封装率。采用MR扫描仪测定T1,计算Gd-PLGA微球的弛豫率(R1);在磷酸盐缓冲液(PBS组)和双蒸水环境下(双蒸水组)模拟Gd-PLGA的体外释放规律。结果 成功制备出Gd-PLGA,被包裹的Gd-DTPA为15.00 mg,封装率为31.99%,包裹后R1弛豫性能下降( $P=0.008$ )。体外释放规律研究发现微球在双蒸水环境释放量多于PBS,但组间差异无统计学意义( $P=0.691$ )。组间单位时间累计释放曲线形态相似。结论 采用乳化溶剂蒸发法成功制备出Gd-PLGA,Gd-DTPA被PLGA包裹后R1下降,释放规律与其他PLGA微球体系相似。

英文摘要:

**Objective** To prepare Gd-DTPA-loaded poly(lactic acid glycolic acid) (PLGA) microspheres (Gd-PLGA) for MR contrast agents, and to research its relaxation properties, in vitro release, in order to lay foundation for MR molecular imaging probe. **Methods** Gd-PLGA was prepared by emulsion solvent evaporation method (water/oil/water). The content of Gd-DTPA was determined by using high performance liquid chromatography method, then the encapsulation efficiency of Gd-PLGA was measured by using centrifugation method. T1 relaxation times were measured by MR scanner, and then R1 relaxation properties of Gd-PLGA were calculated. The in vitro release laws of Gd-PLGA in environment of phosphate buffer solution (PBS) and double distilled water were simulated. **Results** Gd-PLGA was successfully prepared, the amount of encapsulated Gd-DTPA was 15.00 mg, and the encapsulation efficiency was 31.99%. The relaxation properties of Gd-DTPA decreased after wrapped with PLGA ( $P=0.008$ ). The amount of release in the environment of double distilled water was more than that in the environment of PBS, but no statistical difference was observed ( $P=0.691$ ). The cumulative release curves were similar between the environment of double distilled water and PBS. **Conclusion** Gd-PLGA is prepared by emulsion solvent evaporation method. The relaxation properties of Gd-DTPA decreased after wrapped with PLGA. Gd-PLGA has similar natures with other microspheres system.

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地址: 北京市海淀区北四环西路21号大猷楼502室 邮政编码: 100190 电话: 010-82547901/2/3 传真: 010-82547903

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