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研究报告

# $^{99}Tc^{m}$标记的新型糖基化生长抑素体内外生物学评价

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摘要 以天然生长抑素(Somatostatin，SMS)、葡聚糖-10(Dextran10，Dx10)及双功能螯合剂硫代乙酰基-巯基乙酰-二甘氨酰-赖氨酸（MAG2Lys）为原料，合成新型生长抑素配体化合物SMS-Dx10-MAG2Lys并进行99mTc标记；以125I-奥曲肽（125I-Tyr3-Octreotide）为放射配基，进行受体竞争结合实验，测定SMS-Dx10-MAG2Lys的IC50值；并用99mTc-MAG2Lys-Dx10-SMS进行正常SD大鼠体内分布、血浆清除以及肿瘤模型动物显像实验。结果表明：配体化合物SMS-Dx10-MAG2Lys保持了对生长抑素2型受体高亲和力；其IC50值与SMS相近； 99mTc-MAG2Lys-Dx10-SMS在正常大鼠体内血浆半衰期为2.4 h，主要浓聚肝、脾脏并经肾排泄，与葡聚糖的代谢途径基本一致，荷胰腺癌裸鼠显像表明，注射后4 h，肿瘤组织具有明显的放射性摄取，99mTc-MAG2L-Dx10-SMS有望成为一种新型生长抑素受体阳性肿瘤显像剂。

关键词 葡聚糖 生长抑素 血液半衰期 99mTc 肿瘤

分类号



# Biological Properties Evaluation of $^{99}Tc^{m}$ Radiolabeled a Novel Glycosylated Somatostatin

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**Abstract** Natural somatostatin (SMS), dextran-10 (Dx10) and a new bifunctional chelator S-Acetyl-Mercaptoacetyl-glycyl-glycyl-Lysine (MAG2Lys) were used to synthesis a novel somatostatin-dextran-MAG2Lys (SMS-Dx10-MAG2Lys) conjugate and then radiolabeled with 99mTc. The in vitro somatostatin receptor competition binding study of SMS-Dx10-MAG2Lys was carried out by using rat brain cortex membranes (express somatostatin receptor type 2) and 125I-Tyr3-Octreotide as a radioligand. The biodistribution and blood half-life of 99mTc-MAG2Lys-Dx10-SMS were investigated in normal rats. The tumor uptake and imaging properties of 99mTc-MAG2Lys-Dx10-SMS were evaluated in nude mice bearing human pancreatic tumor. The SMS-Dx10-MAG2Lys shows high somatostatin receptor binding affinity, i.e. in the same IC50 value range as the reference ligand somatostatin (IC50 ~ 1.0 nmol/L). The blood half-life of 99mTc-MAG2Lys-Dx10-SMS was 2.4 h post injection in normal rats. The digestion and excretion was mainly through the hepatobiliary and kidney system. The 99mTc-MAG2Lys-Dex10-SMS was localized in pancreatic tumor and showed visible tumor uptake at 4 h imaging. The results indicate that 99mTc-MAG2Lys-Dx10-SMS is a novel promising candidate imaging agent for somatostatin receptor positive tumor.

**Key words** Dextran Somatostatin Blood half-life 99mTc Tumor

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