

综述

核酸适配子在疾病诊断研究中的应用

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摘要:

核酸适配子是通过指数富集的配体系统进化(systematic evolution of ligands by exponential enrichment, SELEX)技术从单链随机寡核苷酸文库中筛选得到的单链寡核苷酸配体, 其与靶标的结合具有高特异性及高亲和力等优点, 使其能广泛地应用于疾病诊断研究。适配子在生化检测、新肿瘤标志物发现、分子成像、病原微生物检测等领域的应用研究中均有报道, 并显示出良好的应用前景。

关键词: 适配子 指数富集的配体系统进化 靶标 诊断

Nucleic acid aptamers in diagnosis of diseases

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Abstract:

Aptamers are single-stranded oligonucleotide ligands selected from a random pool of oligonucleotide sequences by systematic evolution of ligands by exponential enrichment. With the advantages of binding to targets with high specificity and affinity, aptamers have been used in the diagnosis widely, such as biochemistry detection, discovery of new tumor markers, molecular imaging, pathogenic and microorganism detection, showing a good application prospect.

Keywords: aptamer systematic evolution of ligand by exponential enrichment target diagnosis

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参考文献:

1. Tuerk C, Gold L. Systematic evolution of ligands by exponential enrichment: RNA ligands to Bacteriophage T4 DNA polymerase [J]. Science, 1990, 249(4968): 505-510.
2. Ellington AD, Szostak JW. In vitro selection of RNA molecules that bind specific ligands [J]. Nature, 1990, 346(30): 818-822.
3. De Grasse JA. A single-stranded DNA aptamer that selectively binds to Staphy-lococcus aureus enterotoxin B [J]. PLoS One, 2012, 7(3):

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4. Lin MC, Nawarak J, Chen TY, et al. Rapid detection of natriuretic peptides by a microfluidic LabChip analyzer with DNA aptamers: Application of natriuretic peptides detection [J].

Biomicrofluidics, 2009, 3(3): 33410.

5. Pepys MB, Hirschfield GM. C-reactive protein: a critical update [J].

J Clin Invest, 2003, 111(12): 1805-1812.

6. Bini A, Centi S, Tombelli S, et al. Development of an optical RNA-based aptasensor for C-reactive protein

[J]. *Anal Bioanal Chem*, 2008,

390(4): 1077-1086.

7. Wang MS, Black JC, Knowles MK, et al. C-reactive protein (CRP) aptamer binds to monomeric but not pentameric form of CRP

[J]. *Anal*

Bioanal Chem, 2011, 401(4): 1309-1318.

8. Lupold SE, Hicke BJ, Lin Y, et al. Identification and characterization of nuclease-stabilized RNA molecules that bind human prostate cancer cells via the prostate-specific membrane antigen

[J]. *Cancer Res*, 2002,

62(14): 4029-4033.

9. Chen Y, Foss CA, Byun Y, et al. Radiohalogenated prostate-specific membrane antigen (PSMA)-based ureas as imaging agents for prostate cancer

[J]. *J Med Chem*, 2008, 51(24): 7933-7943.

10. Lee YJ, Lee SW. Regression of hepatocarcinoma cells using RNA aptamer specific to alpha-fetoprotein

[J]. *Biochem Biophys Res*

Commun, 2012, 417(1): 521-527.

11. Ray P, Rialon-Guevara KL, Veras E, et al. Comparing human pancreatic cell secretomes by in vitro aptamer selection identifies cyclophilin B as a candidate pancreatic cancer biomarker

[J]. *J Clin Invest*, 2012,

122(5): 1734-1741.

12. Dua P, Kang HS, Hong SM, et al. Alkaline phosphatase ALPPL-2 is a novel pancreatic carcinoma-associated protein

[J]. *Cancer Res*, 2013,

73(6): 1934-1945.

13. Mi J, Liu Y, Rabbani ZN, et al. In vivo selection of tumor-targeting RNA motifs

[J]. *Nat Chem Biol*, 2010, 6(1): 22-24.

14. Kim D, Jeong YY, Jon S. A drug-loaded aptamer-gold nanoparticle bioconjugate for combined CT imaging and therapy of prostate cancer

[J]. *ACS Nano*, 2010, 4(7): 3689-3696.

15. Bagalkot V, Zhang L, Levy-Nissenbaum E, et al. Quantum dot-aptamer conjugates for synchronous cancer imaging, therapy, and sensing of drug delivery based on bi-fluorescence resonance energy transfer

[J].

Nano Lett, 2007, 7(10): 3065-3070.

16. Shi H, He X, Wang K, et al. Activatable aptamer probe for contrast-enhanced in vivo cancer imaging based on cell membrane protein-triggered conformation alteration

[J]. *Proc Natl Acad Sci USA*, 2011,

108(10): 3900-3905.

17. Chen F, Hu Y, Li D, et al. CS-SELEX generates high-affinity ssDNA aptamers as molecular probes for hepatitis C virus envelope glycoprotein E2

[J]. *PLoS One*, 2009, 4 (12): 8142.

18. Park JH, Jee MH, Kwon OS, et al. Infectivity of hepatitis C virus correlates with the amount of envelope protein E2: development of a new aptamer-based assay system suitable for measuring the infectious titer of HCV

[J]. *Virology*, 2013, 439(1): 13-22.

19. Rotherham LS, Maserumule C, Dheda K, et al. Selection and

application of ssDNA aptamers to detect active TB from sputum samples

[J]. PLoS One, 2012, 7(10): 46862.

20. Nagarkatti R, Bist V, Sun S, et al. Development of an aptamer-based concentration method for the detection of *Trypanosoma cruzi* in blood

[J]. PLoS One, 2012, 7(8): 43533.

21. Lee S, Song KM, Jeon W, et al. A highly sensitive aptasensor towards *Plasmodium lactate dehydrogenase* for the diagnosis of malaria

[J].

Biosens Bioelectron, 2012, 35(1): 291-296.

22. Jeon W, Lee S, Dh M, et al. A colorimetric apta-sensor for the diagnosis of malaria based on cationic polymers and gold nanoparticles

[J]. Anal

Biochem, 2013, 439(1): 11-16.

23. Zhou J, Soontornworajit B, Wang Y. A temperature-responsive antibody-like nanostructure

[J]. Biomacromolecules, 2010, 11(8):

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[J]. 中南大学学报(医学版), 2008,33(08): 761-764

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3. 赵田秀; 蔡颖; 陈平;. 原发性肺透明细胞癌1例报告[J]. 中南大学学报(医学版), 2001,26(5): 433-

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6. 阳惠湘; 林敏娟; 陈爱莲;. 克隆病20例临床分析[J]. 中南大学学报(医学版), 2001,26(5): 490-

7. 王继贵;. 血清IV型胶原水平的测定及该胶原在各型肝炎患者体内的变化[J]. 中南大学学报(医学版), 2001,26(6): 546-

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9. 詹瑞森; 张朝跃; 臧小芳;. 三维CT重建在骨关节损伤及椎管狭窄诊断与治疗中的应用[J]. 中南大学学报(医学版), 2002,27(1): 55-

10. 诸兰艳; 黄信刚; 欧阳若云; 向旭东;. 肺新型隐球菌肉芽肿1例[J]. 中南大学学报(医学版), 2002,27(1): 66-

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12. 罗新华; 周平; 罗卓琼;. 经直肠彩超在诊断重复输尿管畸形并异位开口的应用[J]. 中南大学学报(医学版), 2002,27(4): 390-

13. 肖波; 杨晓苏; 王康; 萧剑锋; 李静; 周文斌; 吴志国. 线粒体脑肌病2例报告[J]. 中南大学学报(医学版), 2002,27(5): 408-

14. 马燕琳; 李崎; 潘乾; 夏家辉; 李艳萍; 刘冬娥; 戴和平; 夏昆;. 运用单细胞聚合酶链式反应进行植入前诊断的性别鉴定[J]. 中南大学学报(医学版), 2002,27(6): 487-

15. 李宜雄; 吕新生; 劳学军; 肖广发; 陈志康;. 严重肝外伤的外科处理[J]. 中南大学学报(医学版), 2002,27(6): 530-

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