GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Target replacement strategy for selection of DNA aptamers against the Fc region of mouse IgG

J. Ma[1], M.G. Wang[1], A.H. Mao[2], J.Y. Zeng[3], Y.Q. Liu[2], X.Q. Wang[2], J. Ma[2], Y.J. Tian[4], N. Ma[4], N. Yang[3], L. Wang[2] and S.Q. Liao[2]

[1]School of Life Science and Engineering, Lanzhou University of Technology, Lanzhou, Gansu, China
[2]Gansu Academy of Medical Sciences, Lanzhou, Gansu, China
[3]College of Life Science of Northwest Normal University, Lanzhou, Gansu, China
[4]School of Life Sciences, Lanzhou University, Lanzhou, Gansu, China

Corresponding author: S.Q. Liao
E-mail: lshiqi@126.com

Genet. Mol. Res. 12 (2): 1399-1410 (2013)
Received October 10, 2012
Accepted March 28, 2013
Published April 25, 2013
DOI http://dx.doi.org/10.4238/2013.April.25.11

ABSTRACT. Aptamers that recognize the IgG Fc region are of great interest because of their wide application as an immunology probing tool, for diagnostics, and as affinity agents for antibody purification. We developed a target replacement strategy as a modification of conventional Systematic Evolution of Ligands by EXponential enrichment (SELEX) in order to efficiently select and identify novel DNA aptamers against the Fc region of mouse IgG. In this new approach, multiple IgG subclasses (IgG1, IgG2a, mouse IgG Fc, and anti-HBs IgG) were sequentially used to select aptamers in one continuous SELEX. After 8 rounds of selection, the aptamers were analyzed using dot blot and an electrophoretic mobility shift assay, which showed universal binding capability to different IgG subclasses. Secondary structure analysis of the aptamers indicated that the stem-loop structure of the aptamers play an important role in binding to the common site in different mouse

IgG subclasses. This demonstrated the feasibility of using multiple target replacement SELEX for the selection of aptamers. This target replacement strategy is also expected to be useful for selecting aptamers that bind common regions of molecules other than antibodies.

Key words: Target replacement; DNA aptamer; Fc region of mouse IgG; SELEX

