

Selection and characterization of ssDNA aptamer against furaneol

Natalia Komarova ^{1,*}, Mariia Andrianova ¹, Sergey Glukhov ¹, and Alexander Kuznetsov ¹

¹ Scientific-Manufacturing Complex Technological Centre, 1–7 Shokin Square, Zelenograd, Moscow 124498, Russia; kae@tcen.ru

* Correspondence: nat.v.kom@gmail.com; Tel.: +7-926-302-7969

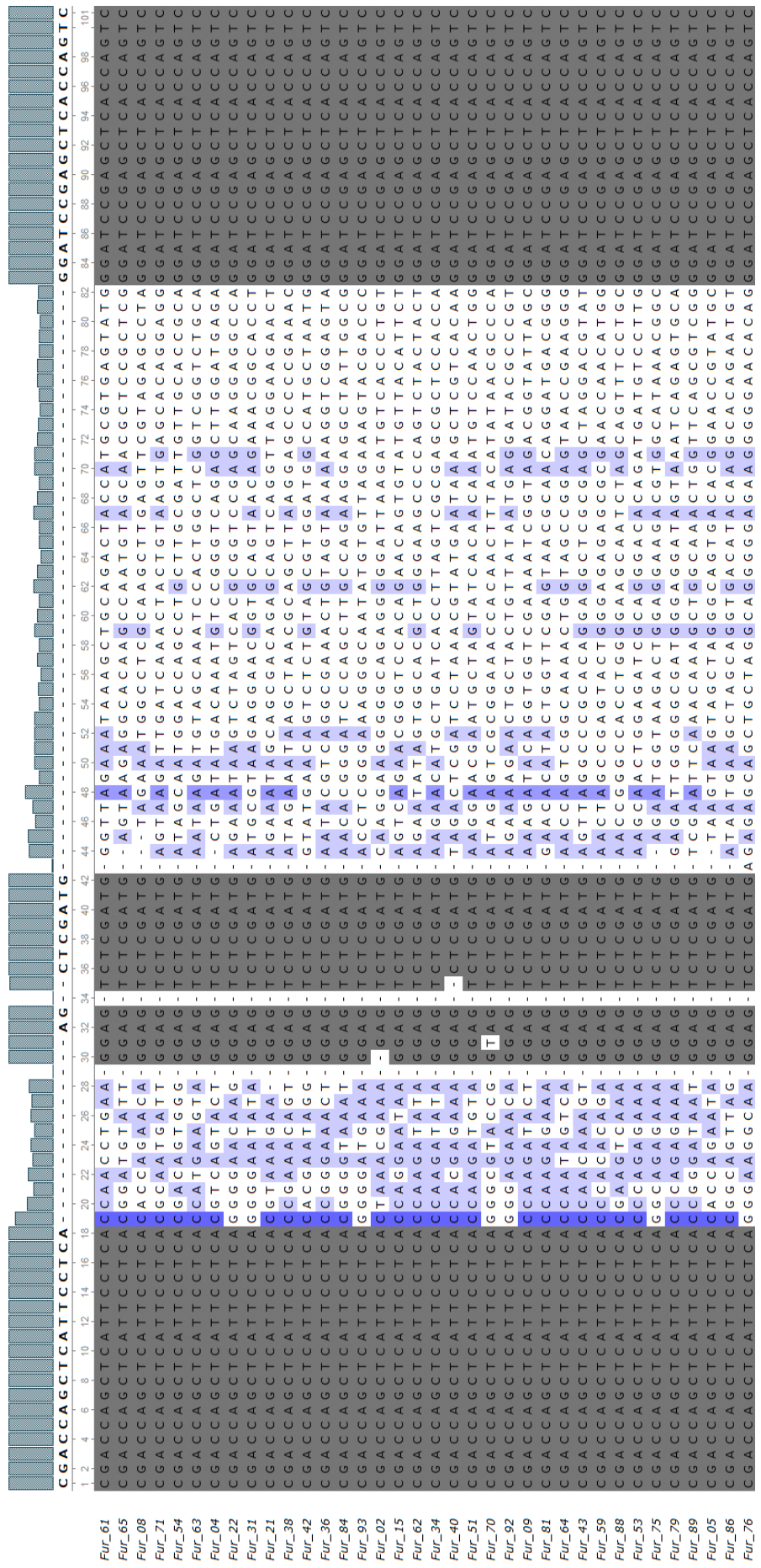


Figure S1. Alignment of the sequenced oligonucleotide pool. Constant regions of B1_bank library are highlighted in grey.

<i>Fur_87</i>	CGACCAGCTCATTCTCCTCAITGCAAGATATGGAGTCTCGATGAAAGAACTAGTCAGGACGTGATGAAAGGACAGGTA	GGATCCGAGCTCACCCAGTC
<i>Fur_49</i>	CGACCAGCTCATTCTCCTCACGCAAGAAATAGGAGTCTCGATGTAAAGAAATGTCAGAGCGGTCCAGACCGGTTGGTACGAG	GGATCCGAGCTCACCCAGTC
<i>Fur_82</i>	CGACCAGCTCATTCTCCTCACACTAACCGGGAGTCTCGATGATATAGCTGATTCGAGACCGCAACTGTGAAAGATCGTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_07</i>	CGACCAGCTCATTCTCCTCACCAACGGTCCGAGTCTCGATGGTAAGAAATCAATAGCTAGTCAACACGTGCCAGCACGGA	GGATCCGAGCTCACCCAGTC
<i>Fur_47</i>	CGACCAGCTCATTCTCCTCACCGAGCATAAAGGAGTCTCGATGACAAAGTAAAGGAGGCAATATGGTGTGCCCGGATGAGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_58</i>	CGACCAGCTCATTCTCCTCACGATCCGGCGGAGTCTCGATGTCGCGCTAAATAGTGGCCCGCACTGGAGCTAACGTAAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_03</i>	CGACCAGCTCATTCTCCTCACGCCCGCGAGGAGTCTCGATGACAGGAGGKCAACGGGATGATCCAGCGCGTCCGGGG	GGATCCGAGCTCACCCAGTC
<i>Fur_52</i>	CGACCAGCTCATTCTCCTCACAGATAAAAGGAGTCTCGATGAGAAAGATGCAAGGGATAGTGTAGCGTGGGGCACTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_69</i>	CGACCAGCTCATTCTCCTCACAGAAGAAAGGAGTCTCGATGTAGATGCGCAGTGAAGCTGACACCTGTGAACGAACA	GGATCCGAGCTCACCCAGTC
<i>Fur_16</i>	CGACCAGCTCATTCTCCTCACCAAGAAAGGAGTCTCGATGAAAAAGCTGATGGTCTCGCTCACTGTACACAGCAA	GGATCCGAGCTCACCCAGTC
<i>Fur_67</i>	CGACCAGCTCATTCTCCTCACCGTAAACCTGGAGTCTCGATGAAAGTGGCTAGTCAGAGAGCTGAACGCTGCAACAGCAGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_68</i>	CGACCAGCTCATTCTCCTCACCAAGAAAGGAGTCTCGATGATGAAGAAAGGCACTAATGTACCGAGCTGAGGTGGGAA	GGATCCGAGCTCACCCAGTC
<i>Fur_26</i>	CGACCAGCTCATTCTCCTCACAGTACTTGGAGTCTCGATGAGAAATGCAAGGATACAGATGGATCTTGAGCCGAAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_96</i>	CGACCAGCTCATTCTCCTCACAGAAATTTGGAGTCTCGATGATGGATCAACTGGCCCGCAAGCTGATGGTATCAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_27</i>	CGACCAGCTCATTCTCCTCACACAAAGTTGGAGTCTCGATGCTAGTCACTGGTAAGCTGACATAAAGCCCGCA	GGATCCGAGCTCACCCAGTC
<i>Fur_45</i>	CGACCAGCTCATTCTCCTCACACAGAAGAGGAGTCTCGATGAAAGCAAACTGCGCGCGAGGACAAACAGAAACGCTGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_28</i>	CGACCAGCTCATTCTCCTCACCAACGAAAGGAGTCTCGATGAAGTGAACATGGAGGGCTCAACTGCGCGTGCAAGGT	GGATCCGAGCTCACCCAGTC
<i>Fur_74</i>	CGACCAGCTCATTCTCCTCACAGCATGTAAAGGAGTCTCGATGAAGTCCCGTGGCGATGGTCAAGTGTGCAAGCCGAGA	GGATCCGAGCTCACCCAGTC
<i>Fur_95</i>	CGACCAGCTCATTCTCCTCACAGCAACTGGAGTCTCGATGAGAAATGGAATGCAATGGGTCAAGGGGGATGCTCGGGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_12</i>	CGACCAGCTCATTCTCCTCACAGGACACGGAGTCTCGATGACAAAGATCTTAGGAAGAACATCTCGATGCGAGACTA	GGATCCGAGCTCACCCAGTC
<i>Fur_48</i>	CGACCAGCTCATTCTCCTCACCAAAACATGGAGTCTCGATGAAATAAGAACCGTCAAACTGTGGAAAGCGACATAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_14</i>	CGACCAGCTCATTCTCCTCACAGAGAAAAGGAGTCTCGATGAACTGCGAGCCGGATCGACCCTATGCGAGTAGTGGTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_37</i>	CGACCAGCTCATTCTCCTCACAGCACCGAAGGAGTCTCGATGAAAACTCAACTGACTTGGACGGTGGCCGACATGCCCAC	GGATCCGAGCTCACCCAGTC
<i>Fur_72</i>	CGACCAGCTCATTCTCCTCACGAAACCCAAGGAGTCTCGATGAATCACGGAAGCTGGTAGGAAACAGGATGAAACAGAAAGCCATGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_83</i>	CGACCAGCTCATTCTCCTCACGAAAGTAAAGGAGTCTCGATGAACCAAGTACTGTAGCGGAAACACAGTACGAAGATCTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_25</i>	CGACCAGCTCATTCTCCTCACGCAACATCGGAGTCTCGATGTAGTAAAGAAAGTGGATCGGAGCAACACCGCCAGCCGCTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_30</i>	CGACCAGCTCATTCTCCTCACCATGCCAGGAGTCTCGATGTAGAGCGAAGTCCACCGCGAACAGACAGCAACAGCCAGTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_19</i>	CGACCAGCTCATTCTCCTCACAGCCCAAGGAGTCTCGATGTGAATTAAGCCACAGGCGCTGTGATCAACGGGTACGAATGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_56</i>	CGACCAGCTCATTCTCCTCACAGCAAAACGGAGTCTCGATGCAAGTAAAGATAACAGTCTGGAGCCGAAACCACTCGGGAAACCACTCGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_20</i>	CGACCAGCTCATTCTCCTCACCAATAACAGGAGTCTCGATGAATAACACAGGGTACGGGTAGCCAGTCACTAACGATGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_78</i>	CGACCAGCTCATTCTCCTCACCAAGTCACTGGAGTCTCGATGAAGAAAGCGGTCGTAAACAGGTGGGGCACGGAATAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_85</i>	CGACCAGCTCATTCTCCTCACCAATACACGGAGTCTCGATGAAGTAAAGAAAGGGCGCCAGACGAAAGCCCGTATGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_32</i>	CGACCAGCTCATTCTCCTCACGGAGCGTAAAGGAGTCTCGATGAAGCAGGAAGCCGGGGCTACCGAGCCCAAGACCTGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_44</i>	CGACCAGCTCATTCTCCTCACAGAAACAAGGAGTCTCGATGAAATGAACAACACTGACTCAAGAGCCGAAACAACATGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_41</i>	CGACCAGCTCATTCTCCTCACAGAGAAATGGAGTCTCGATGATGATAGGAGCCGAGTCTCGACTAGAAATGACTACAGGGATCCGAGCTCACCCAGTC	GGATCCGAGCTCACCCAGTC
<i>Fur_01</i>	CGACCAGCTCATTCTCCTCACGGCAAGTAAAGGAGTCTCGATCTCACGATAGTAAATGGCAATGGCAATGAAACAAGCCGCGG	GGATCCGAGCTCACCCAGTC

Figure S1. Alignment of the sequenced oligonucleotide pool (continuation). Constant regions of B1_bank library are highlighted in grey.

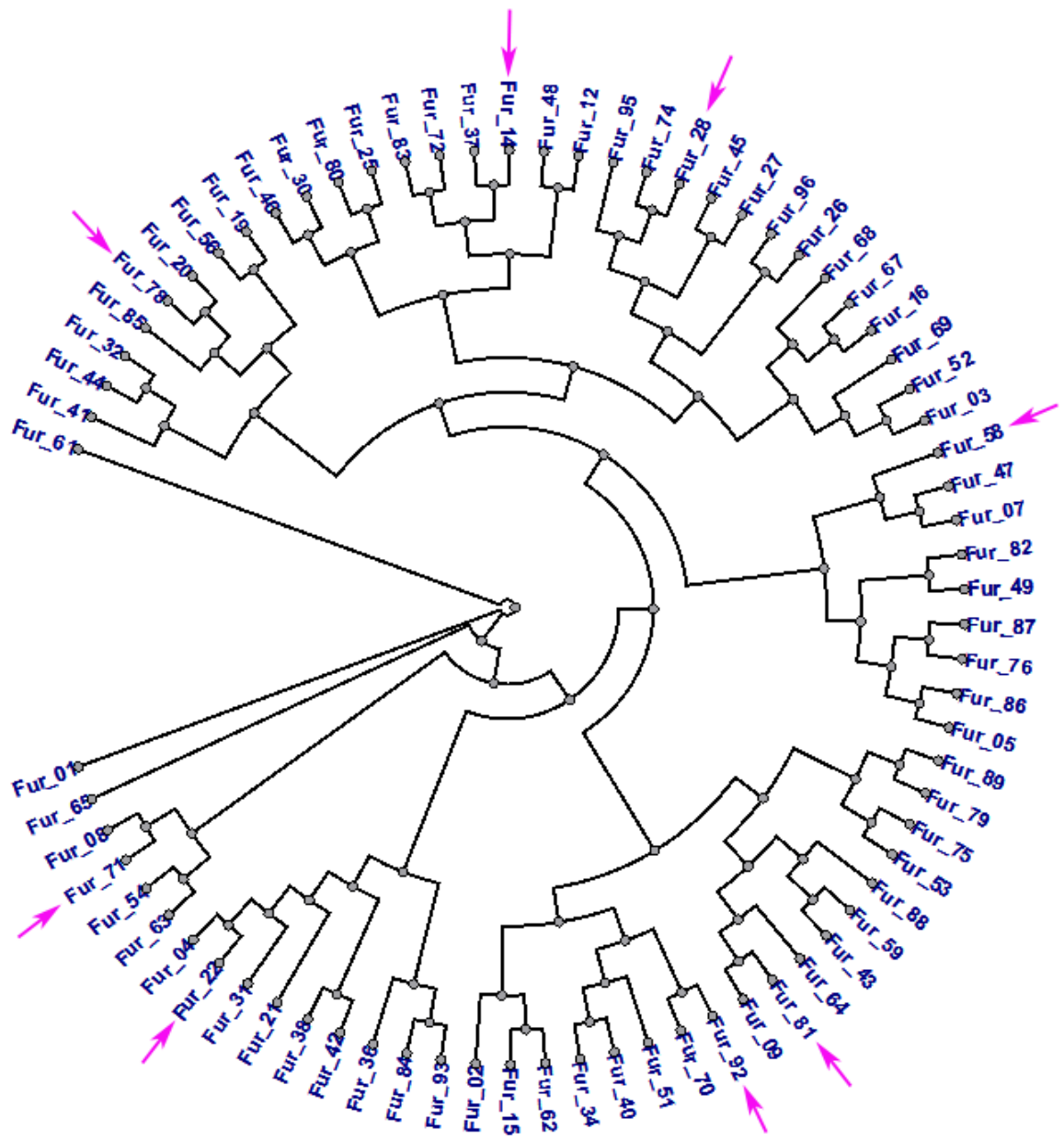


Figure S2. Phylogenetic tree of the sequenced pool of oligonucleotides.

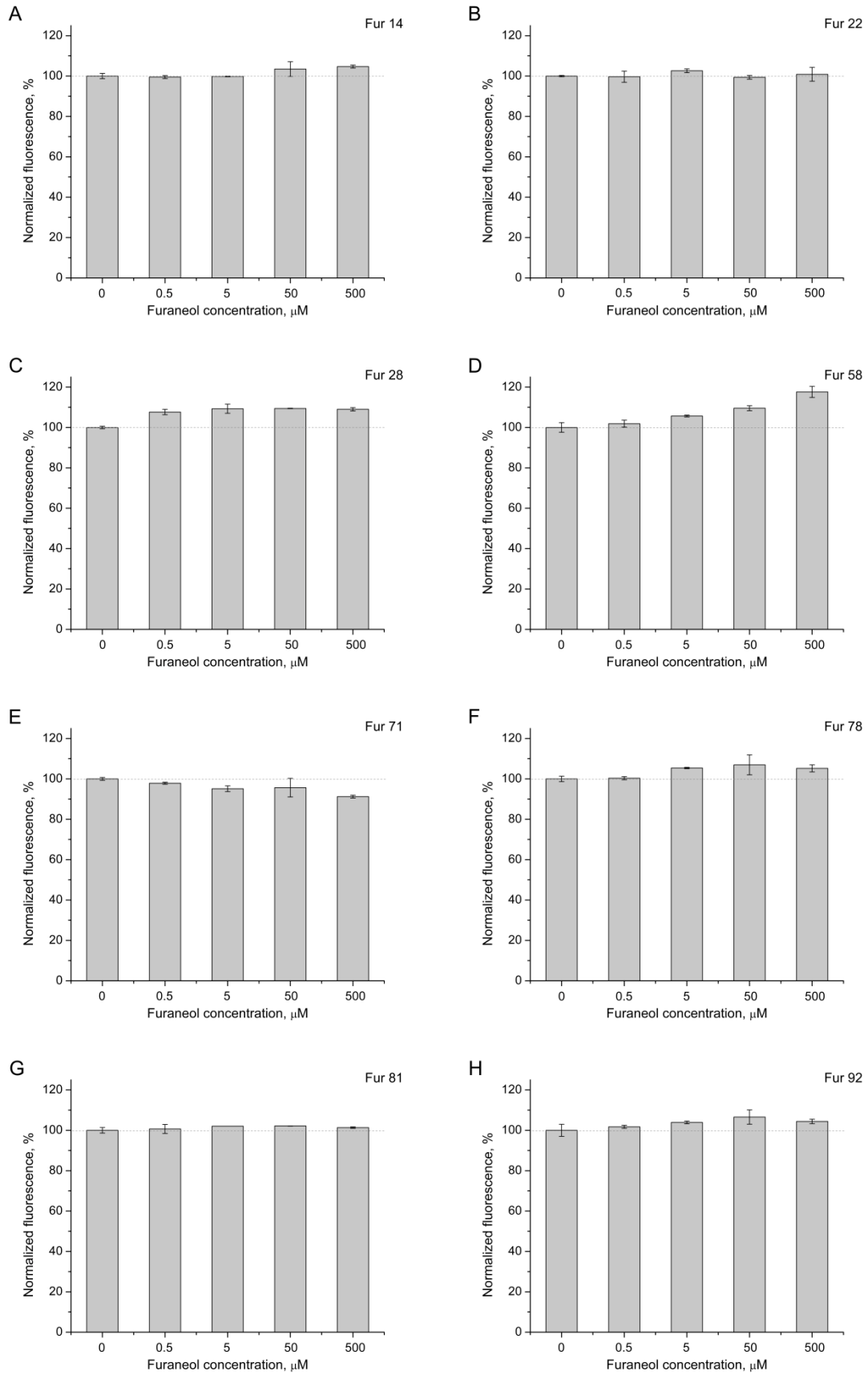
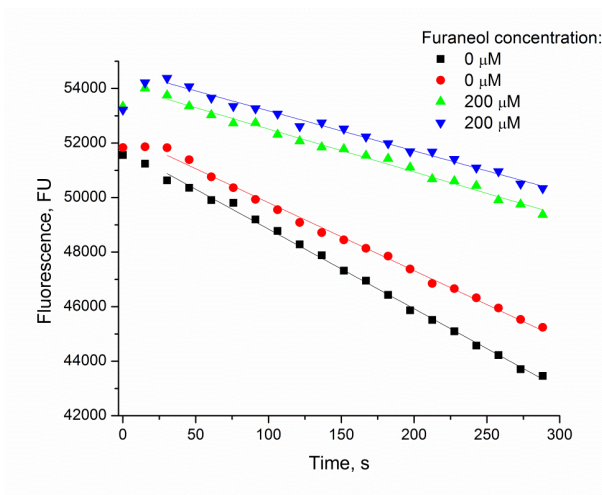
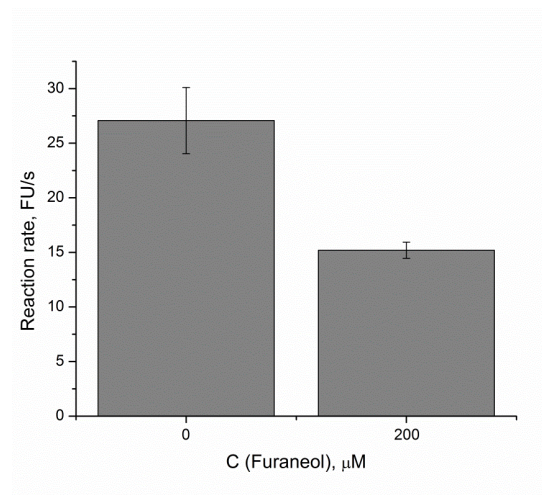


Figure S3. Results of elution-based binding assay for candidate aptamers.



(a)



(b)

Figure S4. (a) Time dependence of fluorescent signal during digestion of Fur14 oligonucleotide by Exo I in the absence of furaneol and in the presence of 200 μM furaneol; (b) Comparison of exonuclease reaction rate for Fur14 the absence of furaneol and in the presence of 200 μM furaneol. Measurements were performed in duplicate, error bars were calculated as standard deviation. The difference between the bars proved to be statistically significant with $p=0.05$.