Electronic Supplementary Material (ESI) for MedChemComm.

Supporting Information

A cell-based screening system for RNA Polymerase I inhibitors

Xiao Tan, [†] & Samuel G. Awuah[*,†]

† Department of Chemistry, University of Kentucky in Lexington, 505 Rose Street., Lexington, Kentucky 40506, United States.

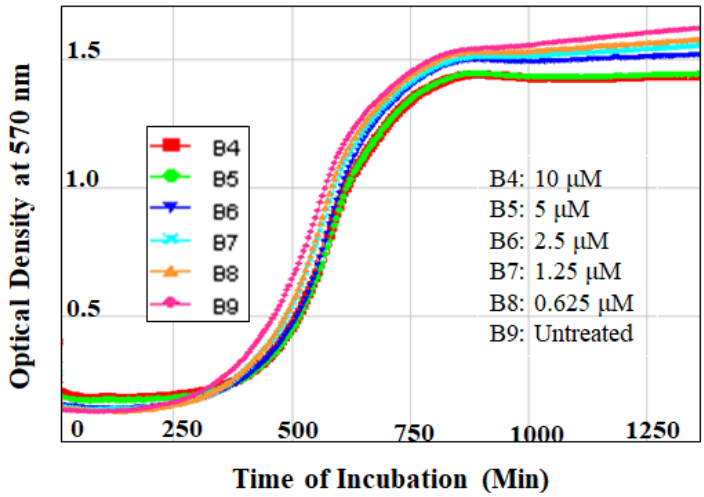

Figure S1. Dose-dependent treatment of yeast YBR140C-HmrDNA using actinomycin D.

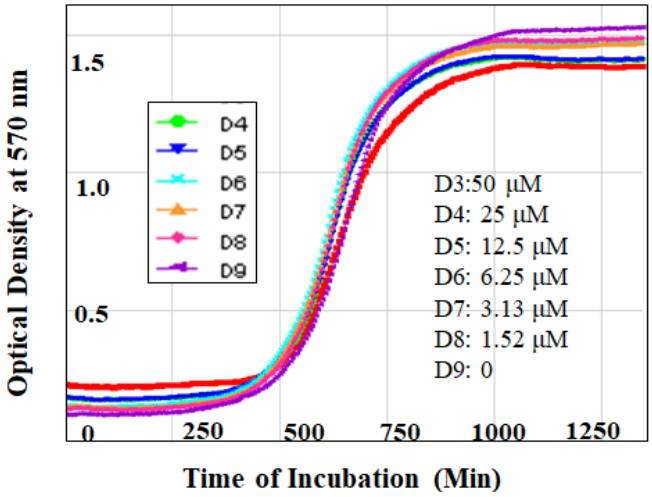

Figure S2. Dose-dependent treatment of yeast YBR140C-HmrDNA using acebutolol hydrochloride.

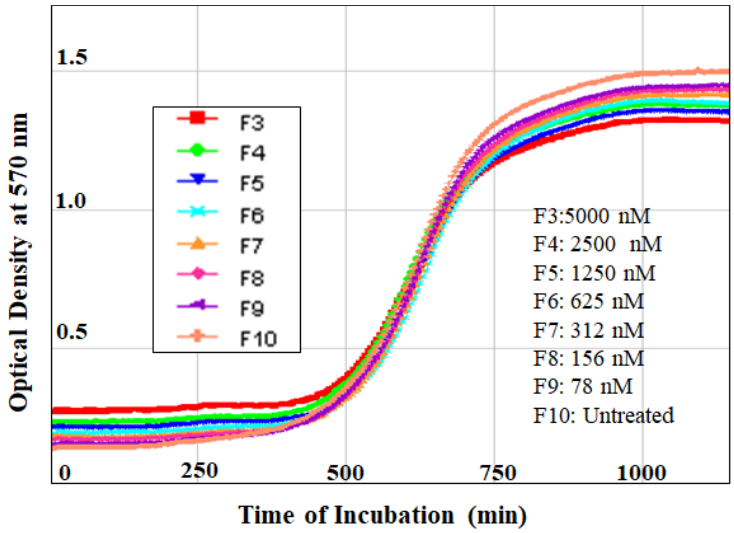

Figure S3. Dose-dependent treatment of yeast YBR140C-HmrDNA using agartroban.

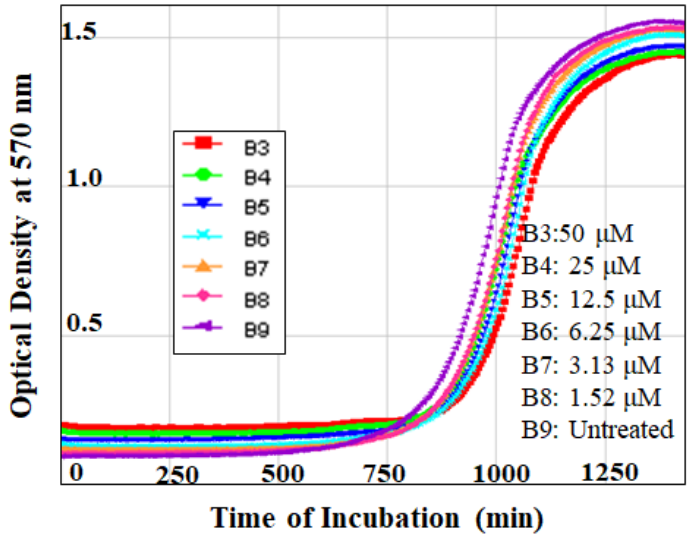

Figure S4. Dose-dependent treatment of yeast YBR140C-HmrDNA using aripirazole.

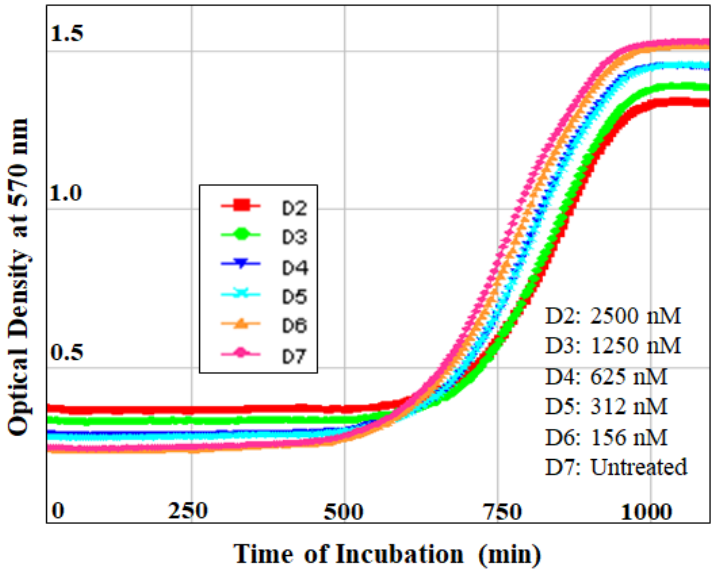

Figure S5. Dose-dependent treatment of yeast YBR140C-HmrDNA using bisoprolol.

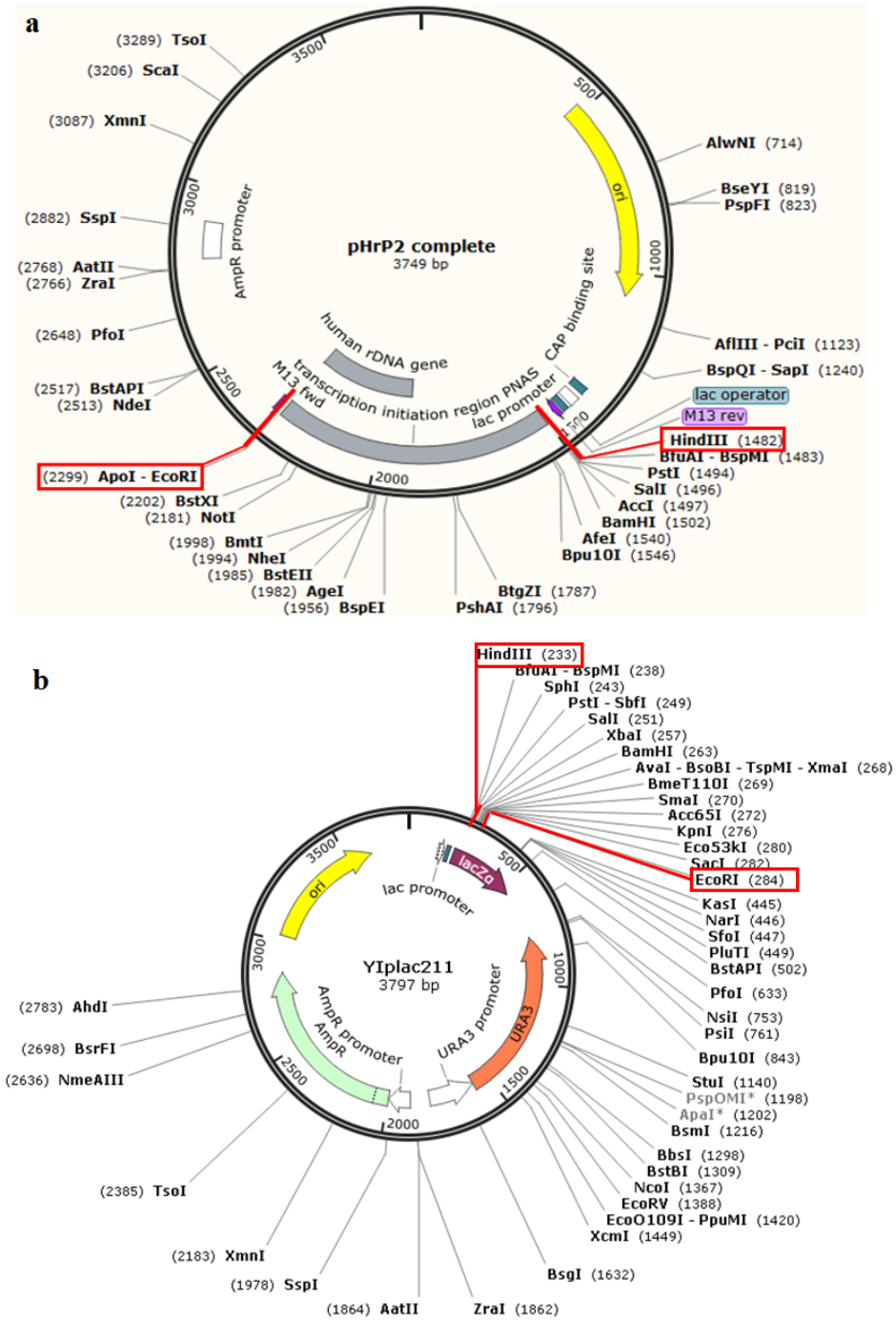

Figure S6. Plasmid Maps of pHrP2 (a) and YIPlac211-TG-1 (b)**.** Red boxes were used to highlight the two restriction endonucleases of HindIII and EcoRI that were used to cut out the insert as well as to linearize the vector plasmid with matching sticky. The thicken red threads were used to depict the positions at which the restriction endonucleases cut. **A.** Plasmid map of pHrP2, the source of Human rDNA plus the promoter. **B**. Plasmid map of YIPlac211-TG1, the vector plasmids that was used to carry the insert and to transform yeast cells.

AAGCTTGGCTGCAGGTCGACGGATCCTTTCTGGCGAGTCCCCGTGCGGAGTCGGAGAGCGCTC
CCTGAGCGCGCGTGCGGCCCGAGAGGTCGCGCCTGGCCGGCCTTCGGTCCCTCGTGTGTCCCGG
TCGTAGGAGGGGCCGGCCGAAAATGCTTCCGGCTCCCGCTCTGGAGACACGGGCCGGCCCCCT
GCGTGTGGCACGGGCGGCCGGGAGGGCGTCCCCGGCCCGGCGCTGCTCCCGCGTGTGTCCTGG
GGTTGACCAGAGGGCCCCGGGCGCTCCGTGTGTGGCTGCGATGGTGGCGTTTTTGGGGACAGGT
GTCCGTGTCGCGCGTCGCCTGGGCCGGCGGCGTGGTCGGTGACGCGACCTCCCGGCCCCGGGG
GAGGTATATCTTTCGCTCCGAGTCGGCATTTTGGGCCGCCGGGTTATTGCTGACACGCTGTCCTCT
GGCGACCTGTCGCTGGAGAGGTTGGGCCTCCGGATGCGCGCGGGGCTCTGGCCTACCGGTGACC
CGGCTAGCCGGCCGCGCTCCTGCTTGAGCCGCCTGCCGGGGCCCGCGGGCCTGCTGTTCTCTCG
CGCGTCCGAGCGTCCCGACTCCCGGTGCCGGCCCGGGTCCGGGTCTCTGACCCACCCGGGGGGG
CGGCGGGGAAGGCGGCGAGGGCCACCGTGCCCCCGTGCGCTCTCCGCTGCGGGCGCCCGGGGC
GGCCGCGACAACCCCACCCCGCTGGCTCCGTGCCGTGCGTGTCAGGCGTTCTCGTCTCCGCGGG
GTTGTCCGCCGCCCCTTCCCCGGAGTGGGGGGTTGGCCGGAGCCGATCCCCGG**GAATTC**

Figure S7. Sequence of insert containing human rDNA plus promoter. The sequence was shown from 5' terminus to 3' terminus that contained human rDNA plus promoter (underscored) and had the sticky ends in bold alphabets.

```
Note2P124rDNAYIP_pHrP2PromoterFWD  ----------CTCNNAGCGCGCGTGCGGC
pHrP2-HumanrDNA-plus-promoter      GATCCTTTCTGGCGAGTCCCCGTGCGGAGTCGGAGAGCGCTCCCTGAGCGCGCGTGCGGC
                                                * *  **************

Note2P124rDNAYIP_pHrP2PromoterFWD  CCGAGAGGTCGCGCCTGGCCGGCCTTCGGTCCCTCGTGTGTCCCGGTCGTAGGAGGGGCC
pHrP2-HumanrDNA-plus-promoter      CCGAGAGGTCGCGCCTGGCCGGCCTTCGGTCCCTCGTGTGTCCCGGTCGTAGGAGGGGCC
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  GGCCGAAAATGCTTCCGGCTCCCGCTCTGGAGACACGGGCCGGCCCCCTGCGTGTGGCAC
pHrP2-HumanrDNA-plus-promoter      GGCCGAAAATGCTTCCGGCTCCCGCTCTGGAGACACGGGCCGGCCCCCTGCGTGTGGCAC
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  GGGCGGCCGGGAGGGCGTCCCCGGCCCGGCGCTGCTCCCGCGTGTGTCCTGGGGTTGACC
pHrP2-HumanrDNA-plus-promoter      GGGCGGCCGGGAGGGCGTCCCCGGCCCGGCGCTGCTCCCGCGTGTGTCCTGGGGTTGACC
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  AGAGGGCCCCGGGCGCTCCGTGTGTGGCTGCGATGGTGGCGTTTTTGGGGACAGGTGTCC
pHrP2-HumanrDNA-plus-promoter      AGAGGGCCCCGGGCGCTCCGTGTGTGGCTGCGATGGTGGCGTTTTTGGGGACAGGTGTCC
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  GTGTCGCGCGTCGCCTGGGCCGGCGGCGTGGTCGGTGACGCGACCTCCCGGCCCCGGGGG
pHrP2-HumanrDNA-plus-promoter      GTGTCGCGCGTCGCCTGGGCCGGCGGCGTGGTCGGTGACGCGACCTCCCGGCCCCGGGGG
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  AGGTATATCTTTCGCTCCGAGTCGGCATTTTGGGCCGCCGGGTTATTGCTGACACGCTGT
pHrP2-HumanrDNA-plus-promoter      AGGTATATCTTTCGCTCCGAGTCGGCATTTTGGGCCGCCGGGTTATTGCTGACACGCTGT
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  CCTCTGGCGACCTGTCGCTGGAGAGGTTGGGCCTCCGGATGCGCGCGGGGCTCTGGCCTA
pHrP2-HumanrDNA-plus-promoter      CCTCTGGCGACCTGTCGCTGGAGAGGTTGGGCCTCCGGATGCGCGCGGGGCTCTGGCCTA
                                   ************************************************************

Note2P124rDNAYIP_pHrP2PromoterFWD  CCGGTGACCCGGCTAGCCGGCCGCGCTCCTGCTTGAGCCGCCTGCCGGGGCCCGCGGGCC
pHrP2-HumanrDNA-plus-promoter      CCGGTGACCCGGCTAGCCGGCCGCGCTCCTGCTTGAGCCGCCTGCCGGGGCCCGCGGGCC
                                   ************************************************************
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Figure S8. Sequence alignment of rDNA plus promoter of YIPlac211-TG1-HmrDNA and pHrP2 plasmids

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Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    ---------------------------NNNNNNNNNNNNNNNNNNNNNNNNNNNNACGCG
HumanrDNA_pHrP2                                                                                                     GCTGACACGCTGTCCTCTGGCGACCTGTCGCTGGAGAGGTTGGGCCTCCGGATGCGCGCG
                                                                                                                                                                        ****

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    GGGCTCTNGCCTACCGGTGACCCGGCTAGCCGGCCGCGCTCCTGCTTGAGCCGCCTGCCG
HumanrDNA_pHrP2                                                                                                     GGGCTCTGGCCTACCGGTGACCCGGCTAGCCGGCCGCGCTCCTGCTTGAGCCGCCTGCCG
                                                                                                                    ******* ****************************************************

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    GGGCCCGCGGGCCTGCTGTTCTCTCGCGCGTCCGAGCGTCCCGACTCCCGGTGCCGGCCC
HumanrDNA_pHrP2                                                                                                     GGGCCCGCGGGCCTGCTGTTCTCTCGCGCGTCCGAGCGTCCCGACTCCCGGTGCCGGCCC
                                                                                                                    ************************************************************

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    GGGTCCGGGTCTCTGACCCACCCGGGG-GCGGCGGGGAAGGCGGCGAGGGCCACCGTGCC
HumanrDNA_pHrP2                                                                                                     GGGTCCGGGTCTCTGACCCACCCGGGGGGCGGCGGGGAAGGCGGCGAGGGCCACCGTGCC
                                                                                                                    *************************** ********************************

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    CCCGTGCGCTCTCCGCTGCGGGCGCCCGGGGCGGCCGCGACAACCCCACCCCGCTGGCTC
HumanrDNA_pHrP2                                                                                                     CCCGTGCGCTCTCCGCTGCGGGCGCCCGGGGCGGCCGCGACAACCCCACCCCGCTGGCTC
                                                                                                                    ************************************************************

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    CGTGCCGTGCGTGTCAGGCGTTCTCGTCTCCGCGGGGTTGTCCGCCGCCCCTTCCCCGGA
HumanrDNA_pHrP2                                                                                                     CGTGCCGTGCGTGTCAGGCGTTCTCGTCTCCGCGGGGTTGTCCGCCGCCCCTTCCCCGGA
                                                                                                                    ************************************************************

Not3P64cDNA4_pHrP2FWD_Sample_Name=Not3P64cDNA4_pHrP2FWD_Chromat_id=8075959_Read_id=8002780_Version=1_Length=356    GTGGGGGGTTGGCCGGAGCCGATN   356
HumanrDNA_pHrP2                                                                                                     GTGGGGGGTTGGCCGGAGCCGATC   384
                                                                                                                    ************************
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Figure S9. Sequence Alignment of PCR Amplicon cDNA of YBR140C-HmrDNA with Human rDNA from pHrP2 Plasmid

GAATTCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAACTTAAT
CGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCC
CTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCCTGATGCGGTATTTTCTCCTTACGCAT
CTGTGCGGTATTTCACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTA
AGCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCAT
CCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATC
ACCGAAACGCGCGAGACGAAAGGGCGGGTAATAACTGATATAATTAAATTGAAGCTCTAATTTGT
GAGTTTAGTATACATGCATTTACTTATAATACAGTTTTTTAGTTTTGCTGGCCGCATCTTCTCAAAT
ATGCTTCCCAGCCTGCTTTTCTGTAACGTTCACCCTCTACCTTAGCATCCCTTCCCTTTGCAAATA
GTCCTCTTCCAACAATAATAATGTCAGATCCTGTAGAGACCACATCATCCACGGTTCTATACTGTT
GACCCAATGCGTCTCCCTTGTCATCTAAACCCACACCGGGTGTCATAATCAACCAATCGTAACCT
TCATCTCTTCCACCCATGTCTCTTTGAGCAATAAAGCCGATAACAAAATCTTTGTCGCTCTTCGCA
ATGTCAACAGTACCCTTAGTATATTCTCCAGTAGATAGGGAGCCCTTGCATGACAATTCTGCTAAC
ATCAAAAGGCCTCTAGGTTCCTTTGTTACTTCTTCTGCCGCCTGCTTCAAACCGCTAACAATACCT
GGGCCCACCACACCGTGTGCATTCGTAATGTCTGCCCATTCTGCTATTCTGTATACACCCGCAGAG
TACTGCAATTTGACTGTATTACCAATGTCAGCAAATTTTCTGTCTTCGAAGAGTAAAAAATTGTAC
TTGGCGGATAATGCCTTTAGCGGCTTAACTGTGCCCTCCATGGAAAAATCAGTCAAGATATCCAC
ATGTGTTTTTAGTAAACAAATTTTGGGACCTAATGCTTCAACTAACTCCAGTAATTCCTTGGTGGT
ACGAACATCCAATGAAGCACACAAGTTTGTTTGCTTTTCGTGCATGATATTAAATAGCTTGGCAG
CAACAGGACTAGGATGAGTAGCAGCACGTTCCTTATATGTAGCTTTCGACATGATTTATCTTCGTT
TCCTGCATGTTTTTGTTCTGTGCAGTTGGGTTAAGAATACTGGGCAATTTCATGTTTCTTCAACAC
TACATATGCGTATATATACCAATCTAAGTCTGTGCTCCTTCCTTCGTTCTTCCTTCTGTTCGGAGAT
TACCGAATCAAAAAAATTTCAAAGAAACCGAAATCAAAAAAAAGAATAAAAAAAAAATGATGA
ATTGAATTGAAAAGCTGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTT
TCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAA
AGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTT
CCTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC
GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGA
ACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGC
CGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCA

GTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCT
TTTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGC
CATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTA
TTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAA
AGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAG
CCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATC
GTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGA
TAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTG
ATTTAAAACTTCATTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAA
AATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTT
CTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCG
GTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAG
CGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTA
GCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTC
GTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGGGCTGAACG
GGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAG
CGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGC
GGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTAT
AGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCG
GAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTG
CTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAG
CTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAG
AGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCTGGCACGA
CAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTAGCTCACTCAT
TAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCTCGTATGTTGTGTGGAATTGTGAGCGGATAA
CAATTTCACACAGGAAACAGCTATGACCATGATTACGCC**AAGCTT**

Figure S10. Sequence of vector template from the yeast integrative plasmid of YIPlac211-TG1. The sequence was shown from 5' end to 3' end with sticky ends in bold alphabets.

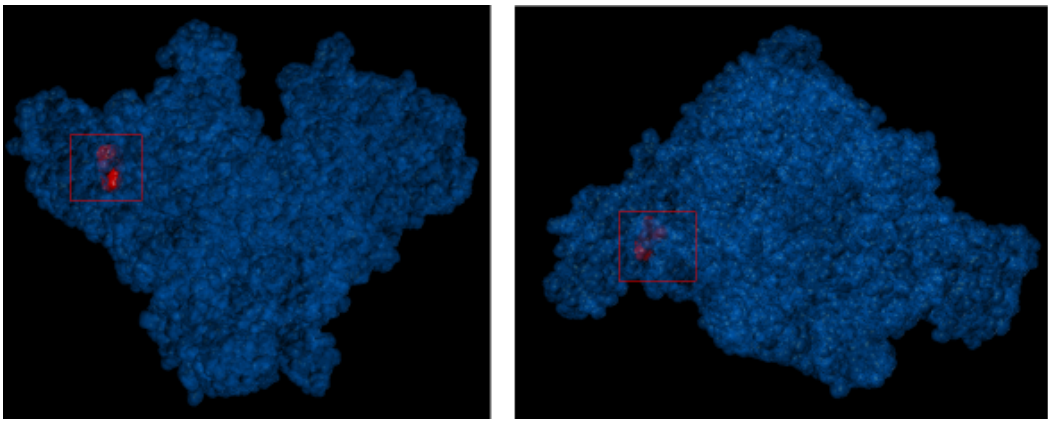
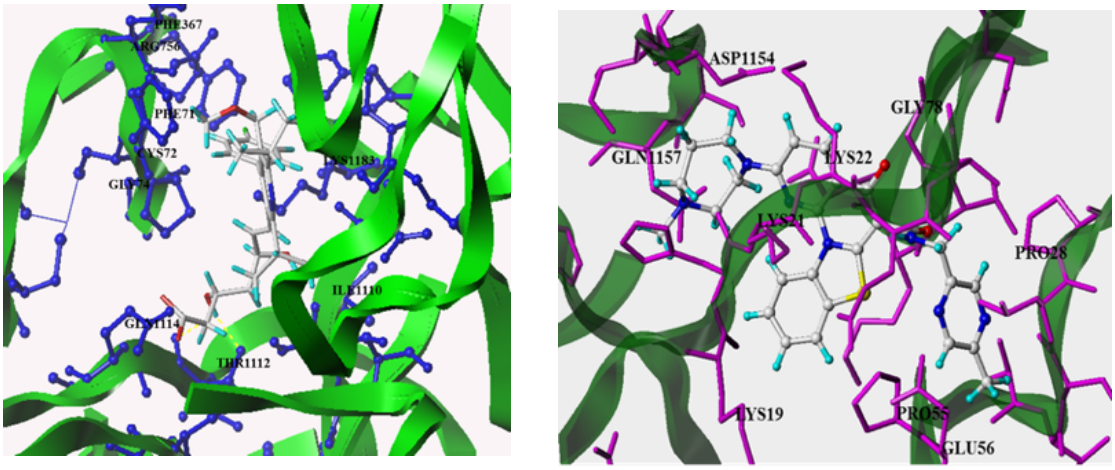


Figure S11. Docking Protomol for Screening Small Compounds from NCATS small-molecule library**.**



a b

Figure S12. a. Interaction between cerivastatin sodium at the interface of RNA Pol I with RRN3. b. Interaction between CX-5461 at the interface of RNA Pol I with RRN3. The images were exported from results of virtual screening done by SYBYL-X**.**