2019nCoV (SARS-CoV-2) RNA-Dependent RNA Polymerase (RdRP, Nsp12)

About Coronavirus RNA-Dependent RNA Polymerase (Coronavirus RdRP)

COVID-19 pandemic is caused by 2019nCoV (SARS-CoV-2) infection. 2019nCoV contains 16 Non-structure protein (Nsp1-Nsp16) that may be drugable targets for antiviral compounds discovery against COVID-19[1].

2019nCoV (SARS-CoV-2) RNA-Dependent RNA Polymerase (RdRP,Nsp12) is a multidomain RNA polymerase, which is the most conserved protein in coronaviruses. The coronavirus RNA-dependent RNA polymerase (RdRp) is essential for the viral replication and transcription.[1]

High-throughput screening (HTS) assay development of Coronavirus RdRP for antiviral compounds

HTS Approach: Fluorescence based assay for time-dependent kinetic analysis
Assay Substrate

1. γ-(BBT)-ATP (γ-[2'(2-benzothiazoyl)-6'-hydroxybenzothiazole)-adenosine-5'-triphosphate, Sodium salt)[2,3]

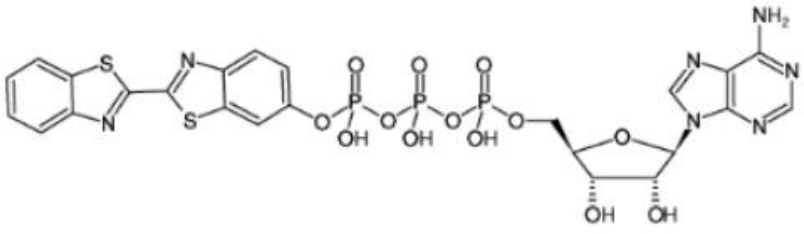

Figure. Structural formula of γ-(BBT)-ATP

2. Self-priming RNA (fluorometric)[2] OR 3′UTR-U30 RNA (radioactive)[3]

Simple 2019nCoV (SARS-CoV-2) RNA-Dependent RNA Polymerase (RdRP） activity assay develoement Protocol[2,3]:

2019nCoV (SARS-CoV-2) RNA-Dependent RNA Polymerase (RdRP)activity assay develoement Protocol-radioactive

2019nCoV (SARS-CoV-2) RNA-Dependent RNA Polymerase (RdRP)activity assay develoement Protocol-self priming

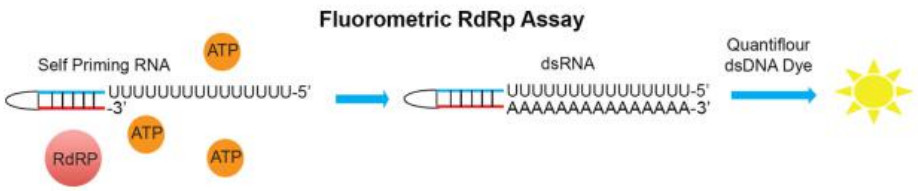

Figure.Schematic representative of Self-priming RNA-based Fluorometric RdRp activity assay

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Website: www.genemedi.net
Tel: +86-21-50478399
Email: support@genemedi.net

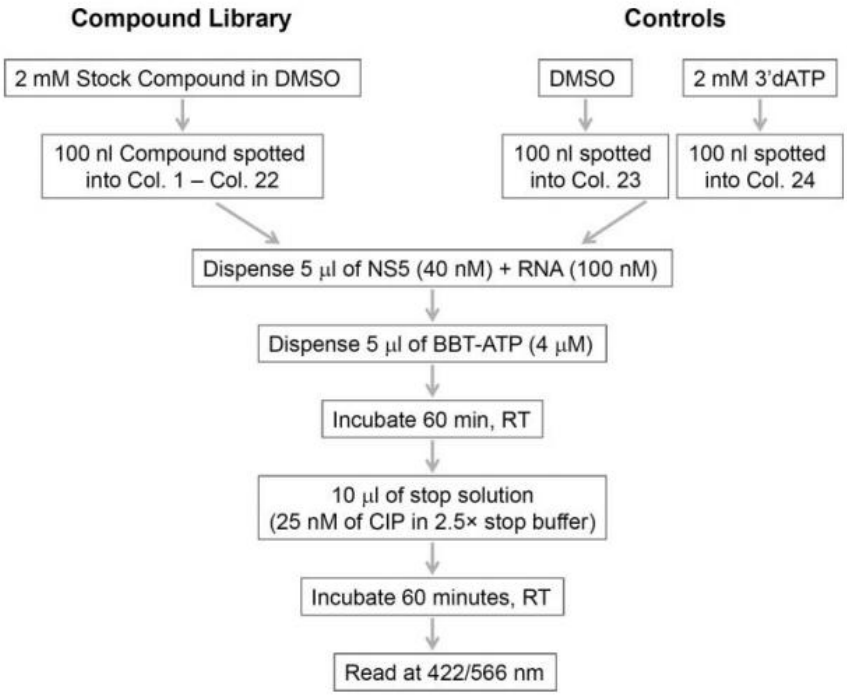

Figure: Screening workflow of the representative library in 384-well plates. Cip, calf intestinal alkaline phosphatase; RT, room temperature2,3.

References

1 Gordon, D. E. *et al.* A SARS-CoV-2-Human Protein-Protein Interaction Map Reveals Drug Targets and Potential Drug-Repurposing. *BioRxiv*, doi:10.1101/2020.03.22.002386 (2020).

2 Kocabas, F., Turan, R. D. & Aslan, G. S. Fluorometric RdRp assay with self-priming RNA. *Virus Genes* **50**, 498-504, doi:10.1007/s11262-015-1187-8 (2015).

3 Niyomrattanakit, P. *et al.* A fluorescence-based alkaline phosphatase-coupled polymerase assay for identification of inhibitors of dengue virus RNA-dependent RNA polymerase. *J Biomol Screen* **16**, 201-210, doi:10.1177/1087057110389323 (2011).

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Website: www.genemedi.net
Tel: +86-21-50478399
Email: support@genemedi.net

SARS-CoV-2 (2019nCoV) Non-structure protein (Nsp) Recombinant Antigens

- Recombinant Proteins Of **SARS-CoV-2 (2019nCoV) Drugable Target** For High-throughput screening (HTS) assay development of antiviral compounds against COVID-19

Name of Non-structure protein of SARS-CoV-2 (2019-nCoV, novel coronavirus)	Name of Gene in Coronavirus	GeneMedi's Recombinant Antigens For Activity Assay	High-throughput screening (HTS) assay development information and protocols
(PLpro) papain-like proteinase	Nsp3	GMP-V-2019nCoV-PLpro001	Download
Mpro (main protease,3CLpro)	Nsp5	GMP-V-2019nCoV-Mpro001	Download
Nsp10-CysHis,GFL protein	Nsp10	GMP-V-2019nCoV-Nsp10-01	Download
RNA-dependent RNA polymerase(RdRP)	Nsp12	GMP-V-2019nCoV-RdRP001	Download
2'-O-ribose methyltransferase	Nsp16	GMP-V-2019nCoV-Nsp16-01	Download
Nsp3-X domain(Macro domain)	Nsp3	GMP-V-2019nCoV-Nsp3X-01	

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Website: www.genemedi.net
Tel: +86-21-50478399
Email: support@genemedi.net