RNA Sequence to Discern Coronavirus Genome Structure
Manu Mitra
University of Bridgeport, Alumnus of department of Electrical Engineering

Example of pX330-U6-Chimeric_BB-CBh-hSpCas9

1. U6 Promoter (10 - 250)
RNA Sequence to Discern Coronavirus Genome Structure

2. gRNA Scaffold (260 - 420)

3. CMV Enhancer (430 - 680)
RNA Sequence to Discern Coronavirus Genome Structure

4. Chicken beta-actin promoter (690 - 930)

cgaagttttaccttttatggcagggcgggggccccctataaaaaagcgaagcgcgggggcttcgctgacgc
gctttcaagagaaatcacgcctccggcgggggtatattttccttcgctcggcggcggatgtacttttt

5. Hybrid intron (940 – 1,190)
tgacctgccccagtcccccgctccggccccgccccgccccgttctgactgacccggttaactcccacaggtgagccg acgcagagcggcccagagggggcaggcgggcgggcggggggcggcagaactgtggcgaacttgaggtgctcagctgccg

BseRI

cccgggaggccctttctcctccgggtttaattagcgcagcaaggatatgggttaaggggtattatataggggttaacccgctccgggacattaatcgactgtctccattccccaaatttcctaccaacacccccatatta
6. 3xFLAG

gcagccgadaagagag

7. Cas9 (1,370 – 1,610)

cggcgaaacaccgcaaggccaccggtgtaaaggaaccgcaagagacattcaacgagatcctggctctcgctgtgccc
8. Cas9 (1,620 – 1,870) [BglII]

9. Cas9 (1,880 – 2,120) [EcoNI and BmgBI]
RNA Sequence to Discern Coronavirus Genome Structure

10. Cas9 (2,130-2,380) [EcoNI]

11. Cas9 (2,370-2,590) [BstAPI]
12. Cas9 (2,600 – 2,810) [ApaI]

ggacaagggcgcttcgcggcaggtcctcagccagtgcctgccatcctaagaaactgcccaacgagaaggccctgtaa gccgaggttgtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggcttcctggtggct tc
RNA Sequence to Discern Coronavirus Genome Structure

14. Cas9 (3,040 – 3,180)

15. Cas9 (3,190 – 3,400) [EcoRV]
<table>
<thead>
<tr>
<th>RNA Sequence to Discern Coronavirus Genome Structure</th>
</tr>
</thead>
</table>

### 16. Cas9 (3,410 – 3,620)

| CCAAGCCGAGAAGCATCGTGATCGAGAATGGCCGAGAAGAACCAGCCACCCAGAAGCCAGAAGAACCAGC |
|---|---|---|---|---|---|---|---|
| 
| 3,410 | 3,420 | 3,430 | 3,440 | 3,450 | 3,460 | 3,470 |

### 17. Cas9 (3,630 – 3,840)

| TCGAGAAGGATCGCGAGCCGAGAAGCAGCCGAGAAGAACCAGCCACCCAGAAGCCAGAAGAACCAGC |
|---|---|---|---|---|---|---|---|
| 
| 3,630 | 3,640 | 3,650 | 3,660 | 3,670 | 3,680 | 3,690 | 3,700 |

### 18. Cas9 (3,840 – 4,050)

| CTGCCGAGAAAGAGATCGCCCGAGAAGGATCGCCCGAGAAGAACCAGCCACCCAGAAGCCAGAAGAACCAGC |
|---|---|---|---|---|---|---|---|
| 
| 3,710 | 3,720 | 3,730 | 3,740 | 3,750 | 3,760 | 3,770 |

| GTGAGAAGGATCTCGCCCGAGAAGGATCTCGCCCGAGAAGAACCAGCCACCCAGAAGCCAGAAGAACCAGC |
|---|---|---|---|---|---|---|---|
| 
| 3,780 | 3,790 | 3,800 | 3,810 | 3,820 | 3,830 | 3,840 |
18. Cas9 (3,850 – 4,070) [pflMI]

19. Cas9 (4,080 – 4,290) [PmII]
RNA Sequence to Discern Coronavirus Genome Structure

20. Cas9 (4,300 – 4,510)

21. Cas9 (4,520 – 4,730)
RNA Sequence to Discern Coronavirus Genome Structure

22. Cas9 (4,740 – 4,950)

23. Cas9 (4,960 – 5,180)
### RNA Sequence to Discern Coronavirus Genome Structure

#### 24. Cas9 (5,190 – 5,400)

![Sequence and Diagram](image)

- **Source**: 5,190 – 5,200
- **Cas9**: 5,220 – 5,230

#### 25. Nucleoplasmin NLS (5,410 – 5,620)

![Sequence and Diagram](image)

- **Source**: 5,410 – 5,420
- **Nucleoplasmin NLS**: 5,431 – 5,440
- **SacI Eco53kI**: 5,450 – 5,460
- **BGH Poly(A) Signal**: 5,480 – 5,500
- **BGH-rev**: 5,500 – 5,510

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13
RNA Sequence to Discern Coronavirus Genome Structure

26. bGH poly(A) signal (5,630 – 5,840)

27. AAV2 ITR (5,850 – 6,060)
RNA Sequence to Discern Coronavirus Genome Structure

28. f1 ori (6,070 – 6,290)

29. pRS-marker (6,300 – 6,510)
RNA Sequence to Discern Coronavirus Genome Structure

30. pGEX 3' (6,520 – 6,730)

31. AmpR promoter (6,740 – 6,950)
RNA Sequence to Discern Coronavirus Genome Structure

32. AmpR promotor (6,960 – 7,170)

33. AmpR promotor (7,180 – 7,400) [BtsI]
**34. AmpR promotor (7,410 – 7,620)**

```
aacttggaatgcacgcaaattagacatcgctgagstaggctcactgattaagctttttagtttaacacgacgggagtctaggccactttccctggtcagttggtacatcattgacacttgacattgagccccttggttactttttagttttaatttaaaggatctagggtagatcctttttatcctagtttagggaattggtgtcactcaaaagacaagcttggtcacttgggtgctgctggttttctactggtttaggaataagacacttcacttctctacttggtaagcacttcttttattttttgacacttttcttcttttgagtacttctttttggtcttccccctccccggggatggagctgactttctttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttt
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**35. AmpR promotor (7,630 – 7,910)**

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cacctcttcgctggccctccggctgctgttttatgtctgataaatcttgagccgggtgtccagcgtggtaacgcggccgacccaggagagcagcccctttccgggcttggaggagttaagcggcatttprocgttcttccctggccttttcaacggtttttgacactattgttgacttcccctgcccctctctgtgcttcttttcttttcttttctttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttttt
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CONCLUSION

1. A model of pX330-U6-Chimeric_BB-CBh-hSpCas9 is used to understand RNA sequence
2. It can be used to comprehend RNA sequence of coronavirus and its genome structure
3. Comparison of “pX330-U6-Chimeric_BB-CBh-hSpCas9” RNA and coronavirus RNA can be made to understand the genome structure of coronavirus

REFERENCES