CAP5011 GAG (ENE)

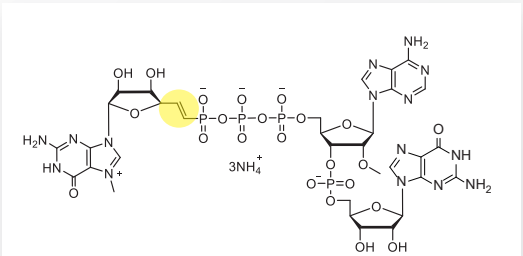
ARETERNA
A Synthgene Company

For the next generation of mRNA.

PRODUCT DESCRIPTION

CAP5011 is ideal for traditional mRNA constructs as a replacement for the next generation of cap analogs. This novel cap analog has improved upon the m7GpppmAG trinucleotide, designed for making mRNA with a Cap1 structure. The innovation comes from the vinylphosphonic acid modification (ENE) of linkage between the m7G cap and 1st ribonucleic acid. The double bond appears to make mRNA more resistant to decapping, and shows an improved pharmakinetic profile.

CAP5011 offers numerous advantages in mRNA performance, seen in both pre-clinical and clinical stages. It is already integrated in several clinical programs for RNA vaccines and cell & gene therapies.



CAP 5 m7G(5')vppp(5')(2'OMeA)pG, 100mM Ammonium Solution
Cat. No.: CAP5011

FEATURESAND BENEFITS

- **Better protein expression than other generations of cap analogs.**
- **License free. Independent intellectual property rights from R&D to commercial stage.**
- **Available in RUO and GMP grade. Registered at FDA with DMF.**
- **Offered at a competitive price to enable wider adoption of mRNA.**

RECOMMENDED IVT CONDITION

Component	Volume
10×Transcription Buffer	2 μL
CAP5011(100mM)	2 μL
ATP/CTP/GTP/N1-Me-pUTP(100mM each)	2 μL each
T7 RNA Polymerase(250 U/μL)	1 μL
Inorganic Pyrophosphatase(1 U/μL)	0.04 μL
Murine RNase inhibitor(40 U/μL)	1 μL
Template DNA	1 μg
RNase free H_2O	Up to 20 μL

CAP5011 is suitable for IVT conditions with Areterna's wild-type T7 RNA Polymerase (Cat. No. 10301), engineered T7 RNA Polymerase (Cat. No. 10308), standard NTPs (Cat. No. ATP001, CTP001, and GTP001), and modified NTPs (Cat. No. NMPUTP001).

SIZES

RUO	
CAP5011-0.1	100 μL
CAP5011-1	1 mL
CAP5011-10	10 mL
GMP	
GMP-CAP5011-1	1 mL
GMP-CAP5011-10	10 mL
GMP-CAP5011-100	100 mL

**Note: Custom aliquot available upon request.*

Areterna-LLC
sales@areterna.com
15810 Gaither Drive, Suite 230
Gaithersburg, MD 20877

ARETERNA LLC ·15810 Gaither Drive, Suite 230, Gaithersburg, MD 20877

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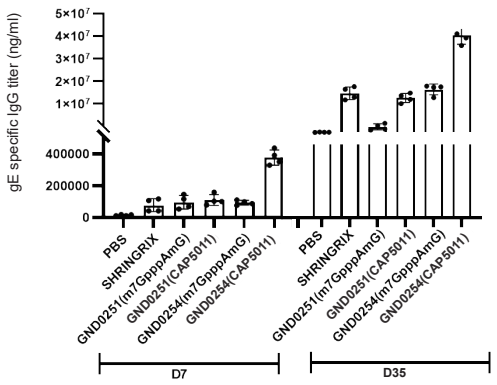
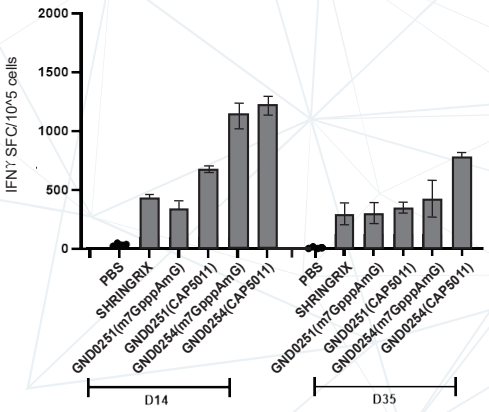
PERFORMANCE DATA

Evaluation of Humoral Immunity in Mice



BALB/c mice were immunized with the the VZV vaccine and tested for gE-specific IgG titer. When compared to CAP m7GpppAmG vaccine, our CAP5011 mRNA vaccine showed a 5.26-fold increase in IgG titer on Day 7 and a 2.24-fold increase on Day 35.

Evaluation of Cellular Immunity in Mice

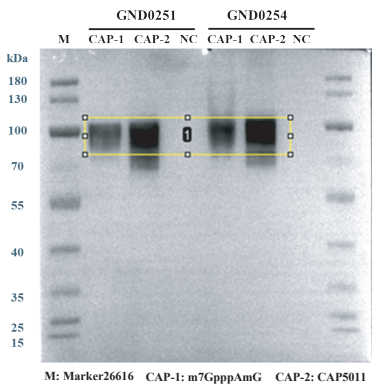


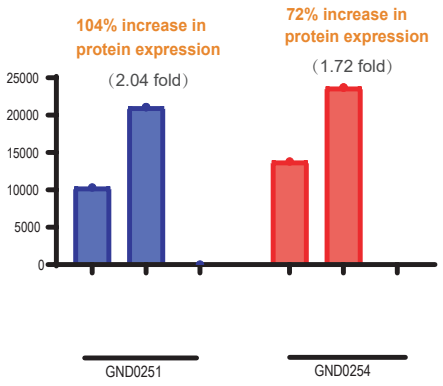
BALB/c mice were immunized with the the VZV vaccine and tested for IFNγ. mRNA capped with CAP5011 demonstrated higher IFNγ secretion than mRNA capped with m7GpppAmG, showing 1.07-fold increase on Day 14 and 1.84-fold increase on Day 35.

CAP5011 Shows Higher Protein Expression

In collaboration with a pharmaceutical partner working Varicella Zoster Virus (VZV), our CAP5011 shows up to 2-fold higher protein expression when compared to existing cap analogs on the market.

VZV gE protein expression (WB)





After transfecting 10μg of GND0251 and GND0254 into HEK293T cells for 48 hours, the expression of gE-specific protein (ab272686) was verified by Western blotting (WB). The expression level of gE protein with CAP5011 was found to be significantly higher compared to m7GpppAmG, showing approximately 2.04-fold and 1.72-fold increases for GND0251 and GND0254.

CONCLUSION

CAP5011 offers Cap1 structure, high capping efficiency, and improved pharmakinetic profile. As a result, CAP5011 has been successfully integrated into multiple clinical programs, demonstrating its therapeutic potential.

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