

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
05 December 2024 (05.12.2024)



(10) International Publication Number
WO 2024/246364 A1

(51) International Patent Classification:

A61K 39/12 (2006.01) A61P 31/20 (2006.01)
A61K 39/39 (2006.01) C07K 16/28 (2006.01)

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

(21) International Application Number:

PCT/EP2024/065209

(22) International Filing Date:

03 June 2024 (03.06.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

23177053.8 02 June 2023 (02.06.2023) EP

Published:

- with international search report (Art. 21(3))
- with sequence listing part of description (Rule 5.2(a))

(71) Applicant: **IMGEN-T SRL** [IT/IT]; Via Parco Carelli 70,
80010 Naples (IT).

(72) Inventors: **SASSO, Emanuele**; Viale Lincoln 198 D,
81100 Caserta (CE) (IT). **NICOSIA, Alfredo**; Via Parco
Carelli 70, 80010 Naples (NA) (IT).

(74) Agent: **ENGELHARD, Markus**; BOEHMERT &
BOEHMERT ANWALTSPARTNERSCHAFT MBB, Pet-
tenkoferstraße 22, 80336 München (DE).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,
KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,
NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO,
RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH,

(54) Title: COMBINATION CONTAINING AN MRNA VACCINE OR AN MRNA ENCODED THERAPEUTIC PROTEIN AND AN IMMUNE MODULATING MRNA FOR IMPROVED OR REDUCED IMMUNOGENICITY TO INCREASE EFFICACY

(57) Abstract: The present invention pertains to a combination comprising two or more mRNA molecules, or a single mRNA molecule encoding a first molecule, which is a therapeutic or immunogenic protein or peptide, and a second molecule, which is a protein or a peptide having the ability to modulate an immune response against the first molecule and/or the translation product of the first molecule, wherein the combination comprises at least one first mRNA molecule encoding a first molecule, which is a therapeutic or immunogenic protein or peptide, and at least one second mRNA molecule encoding a second molecule, which is a protein or a peptide having the ability to modulate an immune response against the first molecule and/or the translation product of the first molecule. The invention also relates to a host cell comprising a combination or the single mRNA molecule according to the present invention, a pharmaceutical composition comprising the combination, the single mRNA molecule, or the host cell of the present invention, and a vaccine comprising the combination, the single mRNA molecule, the host cell, or the pharmaceutical composition according to the present invention. Further provided is a kit comprising the combination, the single mRNA molecule, the host cell, the pharmaceutical composition, or the vaccine according to the present invention. The invention also pertains to the combination, the single mRNA molecule, the host cell, the pharmaceutical composition, the vaccine, or the kit according to the present invention, for use in medicine. Finally, the invention also relates to the combination, the single mRNA molecule, the host cell, the pharmaceutical composition, the vaccine, or the kit according to the present invention, for use in a method of prevention, and/or treatment of an infectious, a genetic, or a proliferative disease.

WO 2024/246364 A1