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(71) Applicant: **NOVAVAX, INC.** [US/US]; 21 Firstfield Road, Gaithersburg, Maryland 20878 (US).

(72) Inventors: **PATEL, Nita**; c/o Novavax, Inc., 21 Firstfield Road, Gaithersburg, Maryland 20878 (US). **SHINDE, Vivek**; c/o Novavax, Inc., 21 Firstfield Road, Gaithersburg, Maryland 20878 (US). **SMITH, Gale**; c/o Novavax, Inc., 21 Firstfield Road, Gaithersburg, Maryland 20878 (US).

(74) Agent: **SPEIER, Gary**; Carlson, Caspers, Vandenburg & Lindquist, P.A., 225 South Sixth Street, Suite 4200, Minneapolis, Minnesota 55402 (US).

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(54) Title: CORONAVIRUS AND INFLUENZA COMPOSITIONS AND METHODS FOR USING THEM

Fig. 1

MEVFLVLLPLVSSQCVNLTTRTQLPPAYTNSFTRGVVYYPDKVFRSSVLHSTQDLFLPFFSN
VTWFHAIHVSGTNGTKRFDNPVLPFNDGVYFASTEKSNIRGWIFGTLLDSKTQSLIVNN
ATNVVVKVCEFFQCNDFLGVVYHKNNKSWMESEFRVYSSANNCTFEYVSQPFLLMDLEG
KQGNFKNLREFVFKNIDGYFKIYSKHTPINLVRDLPQGFSALEPLVDLPIGINITRFQTLAL
HRSYLTGPDSSSGWTAGAAAYVGYLQPRTEFLLYNENGTTTDAVDCALDPLSETKCTLK
SFTVEKGIVQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASVYAWNRRKRISNCVADYS
VLYNSASFSTFKCYGVSPKLNLCFTNVYADSFVIRGDEVRIAPGQTGKIADYNYKLP
DDFTGCVIAWNSNNLDSKVGNNYLYRLFRKSNLKPFERDISTEIQAGSTPCNGVEGF
NCYFPLQSYGFQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTNLVKNKC VNFNENG
LTGTGVLTESNKKFLPFQFGRDIADTTDAVRDPQTLEILDITPCSFGGVSVITPGTNTSNQ
VAVLYQDVNCTEVPVAIHADQLTPTWRVYSTGNSVFQTRAGCLIGAEHVNNSYECDIPIG
AGICASYQTQTNSPRRARSVASQSIIAYTMSLGAENS VAYSNNISIAIPTNFTISVTTEILPVS
MTKTSVDC TMYICGDS TEC SNLLLOYGSFCTQLNRLTGIAVEQDKNTQEVFAQVKQIYK
TPPIKDFGGFNFSQILPDPSPKSPKRSFIEDLLFNK VTLADAGFIKQYGDCLGDI AARDLICA
QKFNGLTVLPPLTDEMIAQYTSALLAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGVT
QNVLYENQKLIANQFNSAIGKIQDSLSTASALGKLQDVVNQNAQALNTLVKQLSSNFGA
ISSVLNDILSRLDKVEAEVQIDRLITGRQLQSLQTYVTQQLIRAAEIRASANLAATKMSECV
LGQSKRVDFCGKGYHLMSPQSAHPGVVFLHVTVYVPAQEKNF TTAIPAICHGDKAHFPRE
GVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGNCDVVIGIVNNTVYDPLQPELDSFKEEL
DKYFKNHTSPDVLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYEQYIKWP
WYIWLGFIAGLIAIVMVTIMLCCMTSCCCLKGCCSCGSCCKFDEDDSEPV LKGVKLHYT

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(57) Abstract: An immunogenic composition for inducing immune responses against both influenza and coronaviruses includes: (a) a coronavirus S (CoV S) glycoprotein in the form of a detergent-core nanoparticle, wherein the detergent is a non-ionic detergent; (b) at least three hemagglutinin (HA) glycoproteins, wherein each HA glycoprotein is from a different influenza strain; and (c) a pharmaceutically acceptable buffer. An immunogenic composition for inducing immune response against influenza includes: (a) at least three hemagglutinin (HA) glycoproteins, wherein each HA glycoprotein is from a different influenza strain, wherein from 30 to 60 µg of HA per strain is present in the composition; and (b) a pharmaceutically acceptable buffer. The immunogenic compositions may include an adjuvant. Methods of stimulating an immune response against SARS-CoV-2, a heterogeneous SARS-CoV-2 strain, an influenza virus, or a combination thereof include the administration of the immunogenic compositions.

[Continued on next page]

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