March 3, 2021

Tina Ip
Senior Regulatory Affairs
Luminex Molecular Diagnostics, Inc.
439 University Ave.
Toronto, ON, Canada M5G1Y8

Device:	NxTAG Respiratory Pathogen Panel + SARS-CoV-2
EUA Number:	EUA210031
Company:	Luminex Molecular Diagnostics, Inc.
Indication:	This test is authorized for the following indications for use: Simultaneous qualitative detection and differentiation of nucleic acid from multiple viral and bacterial respiratory organisms,[1] including nucleic acid from SARS-CoV-2 in nasopharyngeal swabs from individuals suspected of respiratory viral infection consistent with COVID-19 by their healthcare provider. Emergency use of this test is limited to authorized laboratories.
Authorized Laboratories:	Laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet requirements to perform high complexity tests.

Dear Ms. Ip:

This letter is in response to your[2] request that the Food and Drug Administration (FDA) issue an Emergency Use Authorization (EUA) for emergency use of your product,[3] pursuant to Section 564 of the Federal Food, Drug, and Cosmetic Act (the Act) (21 U.S.C. §360bbb-3).

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[1] The NxTAG Respiratory Pathogen Panel + SARS-CoV-2 is intended for the simultaneous detectection and differentiatiation of nucleic acid from SARS- CoV-2 and the following organism types and subtypes: Influenza A, Influenza A H1, Influenza A H3, Influenza B, Respiratory Syncytial Virus A, Respiratory Syncytial Virus B, Coronavirus 229E, Coronavirus OC43, Coronavirus NL63, Coronavirus HKU1, Human Metapneumovirus, Rhinovirus/Enterovirus, Adenovirus, Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, Human Bocavirus, *Chlamydophila pneumoniae*, and/or *Mycoplasma pneumoniae*.
[2] For ease of reference, this letter will use the term "you" and related terms to refer to Luminex Molecular Diagnostics, Inc.
[3] For ease of reference, this letter will use the term "your product" to refer to the NxTAG Respiratory Pathogen Panel + SARS-CoV-2 used for the indication identified above.

On February 4, 2020, pursuant to Section 564(b)(1)(C) of the Act, the Secretary of the Department of Health and Human Services (HHS) determined that there is a public health emergency that has a significant potential to affect national security or the health and security of United States citizens living abroad, and that involves the virus that causes COVID-19. Pursuant to Section 564 of the Act, and on the basis of such determination, the Secretary of HHS then declared that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of the virus that causes COVID-19 subject to the terms of any authorization issued under Section 564(a) of the Act.[4]

There are FDA-approved/cleared tests for Influenza A virus (with subtype differentiation), Influenza B virus, Respiratory Syncytial virus (RSV) A and RSV B, Coronaviruses 229E, OC43, NL63 and HKU1, Human Metapneumovirus, Rhinovirus/Enterovirus, Adenovirus, Parainfluenza virus Types 1, 2, 3, and 4, Human Bocavirus, *Chlamydophila pneumoniae*, and *Mycoplasma pneumoniae* but there are no FDA approved/cleared multiplexed tests for simultaneous qualitative detection and differentiation of SARS-CoV-2, and these additional pathogens targeted by your product. Respiratory infections caused by the aforementioned pathogens and SARS-CoV-2 can have similar clinical presentation and diagnostic considerations. Thus, to differentially detect SARS-CoV-2, information from a test that detects and differentiates the virus that causes COVID-19 and other respiratory pathogens is needed. For example, the common influenza viruses that cause seasonal epidemics of flu, influenza A and B, is needed during the flu season that coincides with the COVID-19 pandemic.

FDA considered the totality of scientific information available in authorizing the emergency use of your product for the indication above. A summary of the performance information FDA relied upon is contained in the "NxTAG Respiratory Pathogen Panel + SARS-CoV-2 Package Insert" (identified below).

Having concluded that the criteria for issuance of this authorization under Section 564(c) of the Act are met, I am authorizing the emergency use of your product, described in the Scope of Authorization of this letter (Section II), subject to the terms of this authorization.

I. Criteria for Issuance of Authorization

I have concluded that the emergency use of your product meets the criteria for issuance of an authorization under Section 564(c) of the Act, because I have concluded that:

1. The SARS-CoV-2 can cause a serious or life-threatening disease or condition, including severe respiratory illness, to humans infected by this virus;

2. Based on the totality of scientific evidence available to FDA, it is reasonable to believe that your product may be effective in diagnosing COVID-19, through the simultaneous detection and differentiation of nucleic acids from SARS-CoV-2 and other respiratory

[4] U.S. Department of Health and Human Services, *Determination of a Public Health Emergency and Declaration that Circumstances Exist Justifying Authorizations Pursuant to Section 564(b) of the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 360bbb-3*. 85 FR 7316 (February 7, 2020).

viral and bacterial organisms[5] and that the known and potential benefits of your product when used for diagnosing COVID-19, outweigh the known and potential risks of your product; and

3. There is no adequate, approved, and available alternative to the emergency use of your product.[6]

II. Scope of Authorization

I have concluded, pursuant to Section 564(d)(1) of the Act, that the scope of this authorization is limited to the indication above.

Authorized Product Details

Your product is a multiplexed nucleic acid RT-PCR PCR test performed on the Luminex MAGPIX instrument intended for the simultaneous qualitative detection and differentiation of nucleic acid from multiple viral and bacterial respiratory organisms, including nucleic acid from SARS-CoV-2 in nasopharyngeal swabs from individuals suspected of respiratory viral infection consistent with COVID-19 by their healthcare provider. Your product can simultaneously detect and differentiate nucleic acid from SARS- CoV-2 and the following organism types and subtypes: Influenza A, Influenza A H1, Influenza A H3, Influenza B, Respiratory Syncytial Virus A, Respiratory Syncytial Virus B, Coronavirus 229E, Coronavirus OC43, Coronavirus NL63, Coronavirus HKU1, Human Metapneumovirus, Rhinovirus/Enterovirus, Adenovirus, Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, Human Bocavirus, *Chlamydophila pneumoniae*, and/or *Mycoplasma pneumoniae*. Clinical signs and symptoms of respiratory viral infection due to SARS-CoV-2 and the aforementioned pathogens can be similar.

SARS-CoV-2 RNA and nucleic acids from the other respiratory viral and bacterial organisms identified by this test are generally detectable in nasopharyngeal swab specimens during the acute phase of infection. Positive results are indicative of the presence of the identified organism, but do not rule out co-infection with other pathogens. The detection and identification of specific viral and bacterial nucleic acids from individuals exhibiting signs and/or symptoms of respiratory infection is indicative of the presence of the identified microorganism and aids in the diagnosis of respiratory infection if used in conjunction with other clinical and epidemiological information. Negative results in the setting of a respiratory illness may be due to infection with pathogens not detected by this test, or lower respiratory tract infection that may not be detected by a nasopharyngeal swab. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Negative SARS-CoV-2 results must be combined with clinical observations, patient history, and/or epidemiological information. Negative results for other organisms reported by the test may require additional laboratory testing (e.g. bacterial and viral

[5] Refer to footnote 1.
[6] No other criteria of issuance have been prescribed by regulation under Section 564(c)(4) of the Act.

culture, immunofluorescence and radiography) when evaluating a patient with a possible respiratory tract infection.

Testing is limited to laboratories certified under CLIA that meet the requirements to perform high complexity tests.

To use your product, SARS-CoV-2 nucleic acid and nucleic acids from other target pathogens are first extracted, isolated and purified from nasopharyngeal swab specimens. Extracted total nucleic acid is added to pre-plated, Lyophilized Bead Reagents (LBRs) and mixed to resuspend the reaction reagents. The reaction is amplified via RT-PCR and the resulting product undergoes near simultaneous bead hybridization within the sealed reaction well. The hybridized, tagged beads are then sorted and read on the MAGPIX instrument. The generated signals are analyzed using the NxTAG RPP + SARS-CoV-2 Assay File for SYNCT Software, providing a qualitative call for multiple viral and bacterial targets including SARS-CoV-2 and internal control within each reaction well. The NxTAG Respiratory Pathogen Panel + SARS-CoV-2 includes the following materials or other authorized materials: NxTAG Respiratory Pathogen Panel + SARS-CoV-2 plate, MS2 reagent and foil seals.

Your product requires the following control materials, or other authorized control materials (as may be requested under Condition K. below), that are processed in the same way as the patient samples and are required to be included with each batch of specimens tested with your product. All controls listed below must generate expected results in order for a test to be considered valid, as outlined in the Package Insert:

- Internal Control – Bacteriophage MS2 which is added to each specimen prior to extraction which allows the user to ascertain whether the assay is functioning properly. Failure to detect the MS2 control indicates a failure at either the extraction step, the reverse-transcription step or the PCR step. Low or no MS2 signal may be indicative of the presence of amplification inhibitors which can lead to false negative results.

You also require use of additional controls (not provided with your product), or other authorized controls (as may be requested under Condition K. below), that are run as outlined in the Package Insert:

- Negative Extraction Control (NEC) – sample collection media that undergoes the entire assay procedure, starting from extraction.
- No Template (Negative) Control - RNAse-free water – used as a negative amplification control.
- Positive Control - contains SARS-CoV-2 material with genomic regions targeted by the kit. The positive control is used to monitor for failures of rRT-PCR reagents and reaction conditions.

Your product also requires the use of additional authorized materials and authorized ancillary reagents that are not included with your product and are described in the Package Insert.

The labeling entitled "NxTAG Respiratory Pathogen Panel + SARS-CoV-2 Package Insert" (available at https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-

emergency-use-authorizations-medical-devices/vitro-diagnostics-euas), the Product Information Card (PIC) and the following fact sheets pertaining to the emergency use, are required to be made available as set forth in the Conditions of Authorization (Section IV), and are collectively referred to as "authorized labeling":

- Fact Sheet for Healthcare Providers: Luminex Molecular Diagnostics, Inc. - NxTAG Respiratory Pathogen Panel + SARS-CoV-2
- Fact Sheet for Patients: Luminex Molecular Diagnostics, Inc. - NxTAG Respiratory Pathogen Panel + SARS-CoV-2

The above described product, when accompanied by the authorized labeling provided as set forth in the Conditions of Authorization (Section IV), is authorized to be distributed to and used by authorized laboratories under this EUA, despite the fact that it does not meet certain requirements otherwise required by applicable federal law.

I have concluded, pursuant to Section 564(d)(2) of the Act, that it is reasonable to believe that the known and potential benefits of your product, when used consistent with the Scope of Authorization of this letter (Section II), outweigh the known and potential risks of your product.

I have concluded, pursuant to Section 564(d)(3) of the Act, based on the totality of scientific evidence available to FDA, that it is reasonable to believe that your product may be effective in diagnosing COVID-19, when used consistent with the Scope of Authorization of this letter (Section II), pursuant to Section 564(c)(2)(A) of the Act.

FDA has reviewed the scientific information available to FDA, including the information supporting the conclusions described in Section I above, and concludes that your product (as described in the Scope of Authorization of this letter (Section II)) meets the criteria set forth in Section 564(c) of the Act concerning safety and potential effectiveness.

The emergency use of your product under this EUA must be consistent with, and may not exceed, the terms of this letter, including the Scope of Authorization (Section II) and the Conditions of Authorization (Section IV). Subject to the terms of this EUA and under the circumstances set forth in the Secretary of HHS's determination under Section 564(b)(1)(C) of the Act described above and the Secretary of HHS's corresponding declaration under Section 564(b)(1) of the Act, your product is authorized for the indication above.

III. Waiver of Certain Requirements

I am waiving the following requirements for your product during the duration of this EUA:

- Current good manufacturing practice requirements, including the quality system requirements under 21 CFR Part 820 with respect to the design, manufacture, packaging, labeling, storage, and distribution of your product, but excluding Subpart H (Acceptance Activities, 21 CFR 820.80 and 21 CFR 820.86), Subpart I (Nonconforming Product, 21 CFR 820.90), and Subpart O (Statistical Techniques, 21 CFR 820.250).

IV. Conditions of Authorization

Pursuant to Section 564(e) of the Act, I am establishing the following conditions on this authorization:

Luminex Molecular Diagnostics, Inc. (You) and Authorized Distributor(s)[7]

A. Your product must comply with the following labeling requirements pursuant to FDA regulations: the intended use statement (21 CFR 809.10(a)(2), (b)(2)); adequate directions for use (21 U.S.C. 352(f)), (21 CFR 809.10(b)(5), (7), and (8)); appropriate limitations on the use of the device including information required under 21 CFR 809.10(a)(4); and any available information regarding performance of the device, including requirements under 21 CFR 809.10(b)(12).

B. You and authorized distributor(s) must make your product available with the authorized labeling to authorized laboratories.

C. You and authorized distributor(s) must make available on your website(s) the authorized labeling.

D. You and authorized distributor(s) will include a physical copy of the authorized PIC card with each shipped product to authorized laboratories, and will make the "NxTAG Respiratory Pathogen Panel + SARS-CoV-2 Package Insert" electronically available with the opportunity to request a copy in paper form, and after such request, you must promptly provide the requested information without additional cost.

E. You and authorized distributor(s) must inform authorized laboratories and relevant public health authorities of this EUA, including the terms and conditions herein, and any updates made to your product and authorized labeling.

F. Through a process of inventory control, you and authorized distributor(s) must maintain records of the authorized laboratories to which they distribute your product and number they distribute.

G. You and authorized distributor(s) must collect information on the performance of your product. You will report to FDA any suspected occurrence of false positive or false negative results and significant deviations from the established performance characteristics of the product of which you become aware.

H. You and authorized distributor(s) are authorized to make available additional information relating to the emergency use of your product that is consistent with, and does not exceed, the terms of this letter of authorization.

[7] "Authorized Distributor(s)" are identified by you, Luminex Molecular Diagnostics, Inc., in your EUA submission as an entity allowed to distribute your product.

Luminex Molecular Diagnostics, Inc. (You)

I. You must notify FDA of any authorized distributor(s) of your product, including the name, address, and phone number of any authorized distributor(s).

J. You must provide authorized distributor(s) with a copy of this EUA and communicate to authorized distributor(s) any subsequent amendments that might be made to this EUA and its authorized accompanying materials (e.g., Fact Sheets).

K. You may request changes to this EUA for your product, including to the Scope of Authorization (Section II in this letter) or to the authorized labeling, including requests to make available additional authorized labeling specific to an authorized distributor. Such additional labeling may use another name for the product but otherwise must be consistent with the authorized labeling, and not exceed the terms of authorization of this letter. Any request for changes to this EUA should be submitted to the Division of Microbiology (DMD)/Office of Health Technology 7 (OHT7)-Office of In Vitro Diagnostics and Radiological Health (OIR)/Office of Product Evaluation and Quality (OPEQ)/Center for Devices and Radiological Health (CDRH) and require appropriate authorization from FDA prior to implementation.

L. You must comply with the following requirements pursuant to FDA regulations: Subpart H (Acceptance Activities, 21 CFR 820.80 and 21 CFR 820.86), Subpart I (Nonconforming Product, 21 CFR 820.90), and Subpart O (Statistical Techniques, 21 CFR 820.250).

M. You must have lot release procedures and the lot release procedures, including the study design and statistical power, must ensure that the tests released for distribution have the clinical and analytical performance claimed in the authorized labeling.

N. If requested by FDA, you must submit lot release procedures to FDA, including sampling protocols, testing protocols, and acceptance criteria, that you use to release lots of your product for distribution in the U.S. If such lot release procedures are requested by FDA, you must provide it within 48 hours of the request.

O. You must evaluate the analytical limit of detection and assess traceability[8] of your product with any FDA-recommended reference material(s). After submission to and concurrence with the data by FDA, you must update your labeling to reflect the additional testing. Such labeling updates will be made in consultation with, and require concurrence of, DMD/OHT7-OIR/OPEQ/CDRH.

P. You must have a process in place to track adverse events, including any occurrence of false results with your product and report to FDA pursuant to 21 CFR Part 803.

Authorized Laboratories

[8] Traceability refers to tracing analytical sensitivity/reactivity back to an FDA-recommended reference material.

Q. Authorized laboratories using your product must include with test result reports, all authorized Fact Sheets. Under exigent circumstances, other appropriate methods for disseminating these Fact Sheets may be used, which may include mass media.

R. Authorized laboratories using your product must use your product as outlined in the authorized labeling. Deviations from the authorized procedures, including the authorized instruments, authorized extraction methods, authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.

S. Authorized laboratories that receive your product must notify the relevant public health authorities of their intent to run your product prior to initiating testing.

T. Authorized laboratories using your product must have a process in place for reporting test results to healthcare providers and relevant public health authorities, as appropriate.

U. Authorized laboratories must collect information on the performance of your product and report to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov) and you (support@luminexcorp.com) any suspected occurrence of false positive or false negative results and significant deviations from the established performance characteristics of your product of which they become aware.

V. All laboratory personnel using your product must be appropriately trained in RT-PCR techniques and use appropriate laboratory and personal protective equipment when handling this kit, and use your product in accordance with the authorized labeling.

Luminex Molecular Diagnostics, Inc. (You), Authorized Distributor(s) and Authorized Laboratories

W. You, authorized distributors, and authorized laboratories using your product will ensure that any records associated with this EUA are maintained until otherwise notified by FDA. Such records will be made available to FDA for inspection upon request.

Conditions Related to Printed Materials, Advertising and Promotion

X. All descriptive printed matter, advertising, and promotional materials relating to the use of your product shall be consistent with the authorized labeling, as well as the terms set forth in this EUA and meet the requirements set forth in sections 502(a), (q)(1) and (r) of the Act and FDA implementing regulations.

Y. No descriptive printed matter, advertising, or promotional materials relating to the use of your product may represent or suggest that this test is safe or effective for the detection of SARS-CoV-2.

Z. All descriptive printed matter, advertising, and promotional materials relating to the use of your product shall clearly and conspicuously state that:

- This test has not been FDA cleared or approved, but been authorized for emergency use by FDA under an EUA for use by authorized laboratories;

- This test has been authorized only for the detection and differentiation of nucleic acid from SARS-CoV-2, Influenza A, Influenza A H1, Influenza A H3, Influenza B, Respiratory Syncytial Virus A, Respiratory Syncytial Virus B, Coronavirus 229E, Coronavirus OC43, Coronavirus NL63, Coronavirus HKU1, Human Metapneumovirus, Rhinovirus/Enterovirus, Adenovirus, Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, Human Bocavirus, *Chlamydophila pneumoniae*, and/or *Mycoplasma pneumoniae*, not for any other viruses or pathogens.; and

- The emergency use of this test is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the declaration is terminated or authorization is revoked sooner.

The emergency use of your product as described in this letter of authorization must comply with the conditions and all other terms of this authorization.

V. Duration of Authorization

This EUA will be effective until the declaration that circumstances exist justifying the authorization of the emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 is terminated under Section 564(b)(2) of the Act or the EUA is revoked under Section 564(g) of the Act.

Sincerely,

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RADM Denise M. Hinton
Chief Scientist
Food and Drug Administration

Enclosure
Technical correction: March 3, 2021