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MEMORANDUM

**Department of Health and Human Services
Food and Drug Administration
Center for Biologics Evaluation and Research**

Date: March 25, 2026

From: Joseph Manik
CBER Shortage Coordinator and Special Assistant for Product Availability
Center for Biologics Evaluation and Research (CBER)
Office of Compliance and Biologics Quality (OCBQ)

Through: Melissa Mendoza, JD
Director, CBER/OCBQ

To: Jennifer H. Albert, RN, DCPM
Regulatory Project Manager, CBER, Office of Therapeutic Products (OTP)

Subject: DSCSA Exemption Request, initially submitted on February 19, 2026, and resubmitted with responses to a CBER information request (IR) on February 25, 2026, by Rocket Pharmaceuticals Inc. for KRESLADI (marnetegrane autotemcel), also referred to as RP-L201, (STN BL 125806)

Action due date: March 26, 2026

I. Background

A. Product Description: See Appendix 1 for the firm's full proposed Prescribing Information (PI).

KRESLADI (marnetegrane autotemcel) is an ex vivo lentiviral vector (LV) gene therapy consisting of autologous hematopoietic stem cells (HSC) transduced with an LV (Chim-CD18-WPRE LV) that encodes for the ITGB2 gene.

The following information was excerpted from the Highlights section of Rocket Pharmaceuticals Inc. proposed Prescribing Information (PI) that was received by the Food and Drug Administration (FDA or Agency) on March 24, 2026, in Biologics License Application, STN BL125806/0.119. It describes the intended use, dosage and administration, and supply of KRESLADI.

INDICATIONS AND USAGE

KRESLADI is an autologous hematopoietic stem cell-based gene therapy indicated for the treatment of pediatric patients with severe leukocyte adhesion deficiency-I (LAD-I)

due to biallelic variants in ITGB2 without an available human leukocyte antigen (HLA)-matched sibling donor for allogeneic hematopoietic stem cell transplant. (1)

This indication is approved under accelerated approval based on increase in neutrophil CD18 and CD11a surface expression [see Clinical Studies (14)]. Continued approval may be contingent upon verification and description of clinical benefit in a confirmatory trial(s).

DOSAGE AND ADMINISTRATION

For autologous use only. For intravenous use only.

- Patients must undergo hematopoietic stem cell (HSC) mobilization followed by apheresis to obtain CD34+ cells for KRESLADI manufacturing. (2.2)
- Dosing of KRESLADI is based on the number of CD34+ cells in the infusion bag(s) per kg of body weight. (2.1)
- The minimum recommended dose is 2.8×10^6 CD34+ cells/kg. (2.1)
- Full myeloablative conditioning must be administered before infusion of KRESLADI. (2.2)
- Verify the patient's identity matches the unique patient identification information on the KRESLADI infusion bag(s) prior to infusion. (2.2)
- Do not sample, alter, or irradiate KRESLADI. (2.2)
- Do not use an in-line blood filter or infusion pump. (2.3)

DOSAGE FORMS AND STRENGTHS

KRESLADI is a cell suspension for intravenous infusion (3)

- KRESLADI is composed of one or two infusion bags which contain 0.34 to 6.1×10^6 cells/mL (including 0.32 to 6.1×10^6 CD34+ cells/mL) suspended in a cryopreservation solution. (3)
- Each infusion bag contains approximately 30 mL of KRESLADI. (3)

HOW SUPPLIED/STORAGE AND HANDLING

KRESLADI is supplied in one or two infusion bags containing a frozen suspension of genetically modified autologous cells enriched for CD34+ cells in a cryo-preserved medium containing 5% DMSO and dextran 40. Each infusion bag contains approximately 30 mL and is individually packed within an overwrap in a metal cassette for protection. KRESLADI is shipped from the manufacturing facility to the infusion center in a cryoshipper, which may contain one or two cassettes intended for treatment of a single patient. A Lot Information Sheet is affixed inside the shipper.

- 50 mL infusion bag and metal cassette (NDC 83537-034-01)
- Match the identity of the patient with the patient identifiers on the cassette(s) and Lot Information Sheet upon receipt.

- Keep the infusion bag(s) in the cassette(s) and store KRESLADI frozen in the vapor phase of liquid nitrogen at less than or equal to -150°C ($\leq -238^{\circ}\text{F}$) until ready for thaw and administration.
- Thaw KRESLADI prior to infusion [see Dosage and Administration (2)].
- Do not re-freeze after thawing.
- Do not irradiate KRESLADI, as this could lead to inactivation.

B. The Drug Supply Chain Security Act (DSCSA):

The DSCSA (Title II of Public Law 113-54) was signed into law on November 27, 2013, and added section 582 to the Federal Food, Drug, and Cosmetic Act (FD&C Act). Section 582 of the FD&C Act includes requirements to facilitate the tracing, identification, and verification of prescription drugs through the pharmaceutical distribution supply chain. Specifically, this section established product tracing, product identifier, authorized trading partner, verification, and enhanced drug distribution security requirements for manufacturers, wholesale distributors, repackagers and dispensers to facilitate the tracing of a product through the pharmaceutical distribution supply chain. Failure to comply with the requirements of section 582 is a prohibited act under section 301(t) of the FD&C Act. See <https://www.fda.gov/drugs/drug-supply-chain-security-act-dscsa/title-ii-drug-quality-and-security-act> for the complete DSCSA.

Product identifier is defined under section 581(14) of the FD&C Act as a standardized graphic that includes the product's standardized numerical identifier (composed of the National Drug Code (NDC) and a unique alphanumeric serial number), lot number, and expiration date, in both human- and machine-readable formats. The product identifier data is specifically required under section 582(a)(9) of the FD&C Act to be in a "2-dimensional data matrix barcode" for packages and in a "linear or 2-dimensional data matrix barcode" for homogenous cases. Under section 582(b)(2)(A) of the FD&C Act, manufacturers are required to "affix or imprint a product identifier to each package and homogenous case of a product intended to be introduced in a transaction into commerce."

II. Rocket Pharmaceuticals Inc. (herein referred to as "firm") requests an exemption from certain requirements in the Federal Food, Drug, and Cosmetic Act (FD&C Act), as amended by the Drug Supply Chain Security Act (DSCSA)

On February 25, 2026, BL 125806/0.106, this firm requested exemption from the following section 582 requirement in the FD&C Act for this product (see Appendix 2 for the firm's exemption request and Appendix 3 for mock-ups of proposed infusion bag and metal cassette labels):

- Section 582(a)(9) – request for exemption for including a 2-dimensional (2D) data matrix barcode

III. OCBQ's REVIEW AND RECOMMENDATIONS

In determining whether to grant exemptions from requirements in section 582 of the FD&C Act, OCBQ evaluated the firm's exemption request, their established Chain of Identity (COI) and Chain of Custody (COC) descriptions for this product (See Appendix 4 – specifically, Section 3.2.P.3.3 Description of Manufacturing Process and Process Controls), including the use of multiple unique identifiers, to ensure adequate identification and tracking of the patient's cells (Hematopoietic Progenitor Cells) through the supply chain, from collection, through the manufacturing process, and to the Qualified Treatment Center (QTC) where KRESLADI is administered to the patient from whom the starting material was collected. OCBQ also evaluated the firm's relevant materials submitted and took the product's intended use and patient population into consideration.

The product currently holds Orphan Drug Designation (16-5430), and Rare Pediatric Disease Designation (RPD-2018-194) from the US Food and Drug Administration (FDA). (see Appendix 5).

Per the firm:

The traceability system tracks collection of cellular source material, shipment to the manufacturing facility, manufacture and storage of the drug product (DP), shipment of DP back to the QTC, and receipt of DP at the QTC.

- Chain of Identity (COI) process – ensures COI is maintained from patient/donor enrollment by the Qualified Treatment Center (QTC) through delivery of the Commercial Drug Product (DP) to the QTC for administration to the patient/recipient. The COI process is based on the requirements of donor-to-recipient, bi-directional product traceability per Good Tissue Practices defined in 21 CFR 1271.290. With donor and recipient being the same, the COI process ensures patients are administered the DP that was made from their own Hematopoietic Progenitor Cells-Apheresis (HPC-A).
 - Key Measures:
 - Non-editable forms and labels incorporate unique identifiers, such as NDC, patient-specific identifier (Patient Name, Date of Birth, Patient ID, and COI ID), Collection-specific identifiers (Donation Identification Number-DIN), and drug product batch-specific identifier (batch number - one lot per patient), ensuring patient traceability.
 - Two-person, real-time verification at all critical handoff steps, e.g., a performer and verifier confirming patient identifiers, DIN, batch number, labeling, and documentation.
 - ALCOA-compliant paper record management to maintain traceability, legibility, and integrity throughout the product journey.
 - Documents that accompany the product across QTC,

manufacturing, trading partners, and courier ensure continuity of identity.

Combination of Identifiers Used in the COI Process:

Identifier	Origin of Identifier
Patient Name	Provided by Qualified Treatment Center
Patient Date of Birth (DOB)	Provided by Qualified Treatment Center
Patient ID (Rocket ID)	Assigned by Sponsor
Chain of Identity (COI) ID	Assigned by Sponsor
Donor Identification Number (DIN)	Assigned by Qualified Treatment Center
Drug Product Lot number (DP Lot #)	Assigned by DP Contract Manufacturing Organization (CMO)

The identifiers can be divided into 3 categories:

1. Patient identifiers: Patient Name, Patient DOB, Patient ID (Rocket ID), and COI ID

Identifiers specific to the patient

2. HPC-A identifier: Donor Identification Number (DIN)

Identifiers specific to the HPC-A collection

3. Drug Product (DP) identifiers: DP Lot number

Identifiers specific to the manufacturing of DP

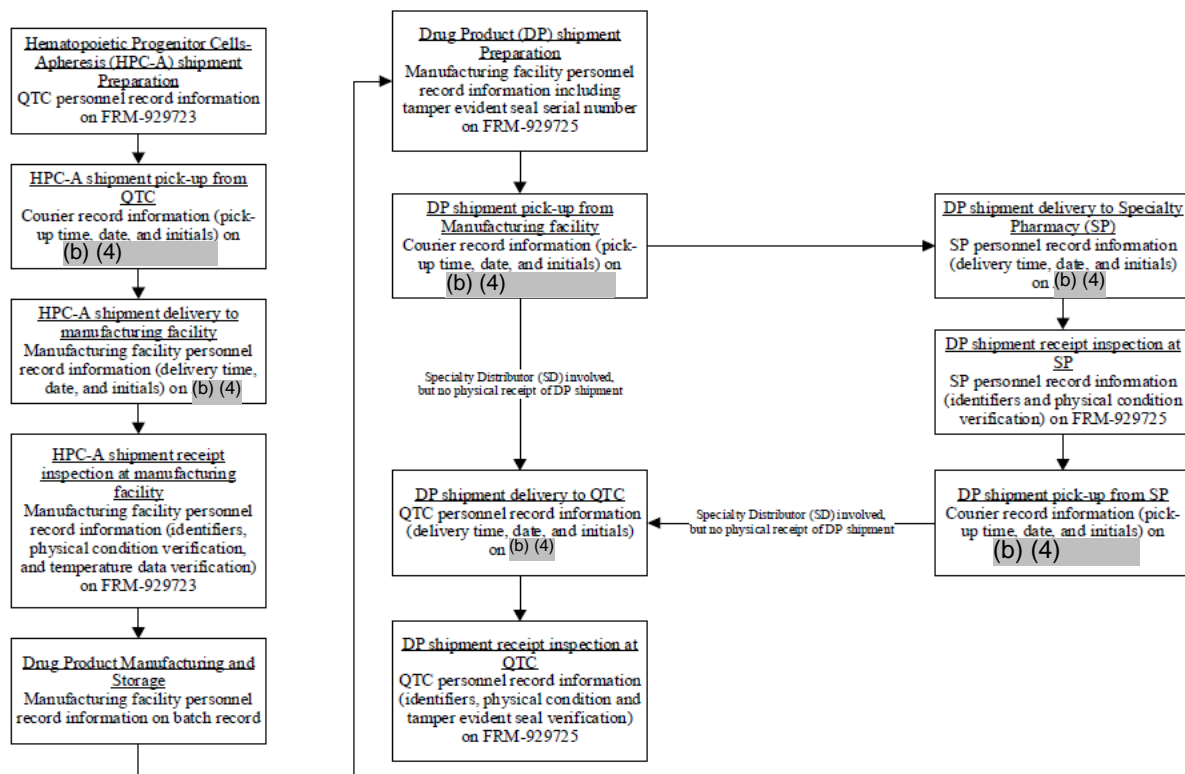
Unique Identifiers through the Commercial Treatment Process:

Identifier	Patient Enrollment + Purchase Order placement	HPC-A Collection + Shipment	HPC-A Receipt + DP Manufacturing	DP Release + Shipment	DP delivery
Patient Name	X	X	X	X	X
Patient DOB	X	X	X	X	X
Patient ID (Rocket ID)	X	X	X	X	X
COI ID	N/A ^a	X	X	X	X
DIN	N/A ^a	X	X	X	X
DP Lot #	N/A ^a	N/A ^a	X	X	X

^aN/A: Not available at this step

- Chain of Custody (COC) process – is paper-based but is structured to incorporate multiple procedural safeguards and documented verification steps to demonstrate the full chronology of custody, i.e., who had the product, when, and under what conditions, as described in the process flow diagram below:
 - Key Measures:
 - Documented custody at each transfer point, with authorized individuals recording receipt, inspection, and release using paper forms.
 - Access control measures that restrict documentation of handling and product access to pre-defined, trained personnel.
 - A tamper-evident serialized seal applied to the shipper.
 - The paper-based system embedded with redundant human verification controls ensures the COC remains secure, closed, and traceable through every operational step from apheresis to infusion.

COC Process Flow Diagram



The firm is requesting an exemption from the use of a 2D barcode on all KRESLADI labeling for the reasons outlined below (per the firm's request):

- KRESLADI is a personalized medicine, an autologous hematopoietic stem cell-based gene therapy, intended to treat a rare pediatric disease with unmet medical need.
- The packaging labeling (cassette and IV bag labels) contains human readable product identifier and patient identification details. Additionally, the packaging labeling and the proposed prescribing information all contain an instructional statement for the Healthcare Provider to verify the patient's identity and unique patient identification information printed on the packaging labeling.
- Manufacturing constraint, specifically the current labeling and packaging systems at [REDACTED], the firm's DP Contract Manufacturing Organization, are not configured or validated to generate and print 2D barcodes, and the beforementioned details related to the unique product identifier and patient identification information that will be printed on the packaging labels. The firm does not think that exemption from the 2D barcode requirement will introduce any additional risk to the safety and security of the drug supply chain for KRESLADI.

The firm's COI and COC documentation also describes a system that relies on the use of a wholesale distributor and a specialty pharmacy to distribute when applicable.

Distributors are subject to the requirements of section 582(c)(1), (c)(2), and (c)(4) unless an exemption is granted by the FDA.

Wholesale Distributor (Specialty Distributor)

(b) (4)

Specialty Pharmacy (Dispenser)

(b) (4)

Per the firm – KRESLADI is shipped under validated cold-chain conditions either directly from the manufacturing facility to the designated QTC or, where applicable, through a specialty pharmacy (SP) in a patient-specific “drive-by” model. In both scenarios, the specialty distributor (SD) does not take physical possession of the product and only takes title to the product as part of the defined trading partner framework.

Where an SP is involved, the SP performs dispensing-related administrative functions. The product remains patient-specific and is not placed into general inventory, pooled, repackaged, or redistributed. Physical shipment occurs in accordance with the pre-defined patient-specific pathway.

The firm further states that at no point is the product held as general wholesale inventory or exposed to secondary market distribution. Each manufactured lot corresponds to a single identified patient and a single QTC destination.

In addition, the firm states:

- Rocket transacts only with licensed and authorized trading partners, including the wholesale distributor and specialty pharmacy (named above).
- Product traceability is maintained through the autologous, single-patient manufacturing model and controlled COI and COC documentation. Each lot corresponds to one patient and one QTC. Title transfer occurs within a defined and limited trading partner network, and transaction documentation is generated and retained in accordance with statutory record retention requirements.
- Trading partners maintain documented procedures governing suspect product identification, quarantine, investigation, and escalation. Serialized tamper-evident seals are applied to each shipping container, and seal integrity is verified upon receipt at the QTC. Any suspected compromise triggers quarantine and investigation. Notification to FDA would occur if an illegitimate product was identified.

After reviewing the supporting documentation that the firm provided with the information stated above by the firm, OCBQ believes that the firm and its trading partners will be able to comply with the wholesale distributor requirements of section 582(c)(1), (c)(2), and (c)(4).

Product Tracing Requirements and Verification Requirements:

Section 582(b)(1)(A)

The firm states that at the time of, or prior to, each title transfer within the defined trading partner network, transaction documentation is generated and retained as described in the COI/COC processes. Documentation includes product identification details, lot number, transaction date, and the identities of the transferring and receiving entities. These records are maintained under Rocket's Quality Management System and retained for not less than six (6) years.

Section 582(b)(1)(C)

The firm states that transaction documentation associated with title transfer is maintained in secure systems consistent with GxP recordkeeping practices and that traceability is achieved through controlled documentation and custody verification rather than traditional serialized electronic interoperable exchange.

Section 582(b)(4)(D)

The firm states that they maintain secure, access-controlled systems for retention of transaction documentation and COI/COC records and that these systems ensure integrity, retrievability, and appropriate retention of records in accordance with statutory requirements.

As previously described, under the DSCSA the product identifier is composed of the NDC, a unique alphanumeric serial number, the lot number, and the expiration date, in both human- and machine-readable formats. The infusion bag and metal cassette labels proposed by the firm for this product includes three of the four required human-readable elements (an NDC number, a lot number, and an expiration date), as well as other unique identifiers (Donor Identification Number (DIN), Chain of Identity ID (COI ID), Rocket ID and Patients Name and Date of Birth), but none of the labels will contain a machine-readable, 2D data matrix barcode. We note that the infusion bag and metal cassette labels, however, contain the machine-readable linear barcode that is required under 21 CFR 201.25. Although the final infusion bag and metal cassette labels will not have a 2D data matrix barcode affixed to them, OCBQ has determined that this firm's request and supporting relevant materials sufficiently describe supply chain processes that are highly controlled, pre-defined, secure, and closed, with tracking procedures that are also adequate to maintain a secure and limited supply chain across all operations of a patient's autologous treatment regimen. Thus, the firm's traceability approach utilizes both human-readable and machine-readable information.

In addition, this firm has described in their supporting documents for this DSCSA exemption request to not include a 2D data matrix barcode that they utilize a paper-based COI and COC process that is designed with multiple procedural safeguards, reconciliation steps, and human verification at each critical step to maintain a secure supply chain (see Appendix 6 for Forms and SOPs used to document the COI and COC steps).

Since a paper-based system is in place:

- The firm is not able to fully comply with Section 582(b)(1) – Product Tracing requirements. On our own accord, OCBQ believes that it is appropriate to grant an exemption to Section 582(b)(1).
 - The firm states that all transaction documentation associated with title transfer is maintained in secure systems consistent with GxP recordkeeping practices and that given the unique autologous, single-lot distribution structure and absence of redistribution risk, traceability is achieved through controlled documentation and custody verification rather than traditional serialized electronic interoperable exchange.
- The firm is not able to fully comply with Section 582(b)(4) – Verification requirements. On our own accord, OCBQ believes that it is appropriate to grant an exemption to Section 582(b)(4).
 - The firm states that KRESLADI is an autologous, single-patient manufacturing model with the absence of redistribution or secondary market exposure, verification is performed through controlled identity and custody mechanisms rather than scan-based serialized package-level verification as described in their COI/COC process.
- The firm is not able to fully comply with Section 582(g)(1) – Enhanced Drug Distribution Security requirements for interoperable, electronic, package-level product tracing. On our own accord, OCBQ believes that it is appropriate to grant an exemption to Section 582(g)(1).

Given the proposed critical public health indication of this autologous hematopoietic stem cell-based gene therapy product manufactured as a single lot per individual patient and the firm's rigorous and meticulous product tracking, tracing and security measures, we have determined that the following exemptions from section 582 of the FD&C Act are appropriate, and as such, we believe that granting these exemptions is appropriate to maintain public health:

- 1) Section 582(a)(9) and section 582(b)(2) – Product Identifier requirements¹.
- 2) Section 582(b)(1) – on our own accord – Product Tracing requirements².
- 3) Section 582(b)(4) – on our own accord – Verification requirements³.
- 4) Section 582(g)(1) – on our own accord – Enhanced Drug Distribution Security requirements⁴.

The exemptions granted in this memorandum and the accompanying OCBQ letter are only valid for transactions of the product described in this memorandum. These exemptions do not extend to any other transactions. In such cases, all applicable requirements of the FD&C Act must be met. Additionally, the exemptions granted are valid until further notice from FDA, so long as the circumstances described by this firm continue to support our decision. The exemption granted letter from the Director of OCBQ will be provided to the Regulatory Project Manager so that it can be sent to the firm when the approval letter for this BLA is issued.

¹ Although the firm specifically asked for relief from section 582(a)(9), OCBQ believes it's appropriate to grant this exemption for section 582(a)(9) and section 582(b)(2) of the FD&C Act.

² Although the firm did not ask for relief from section 582(b)(1), OCBQ believes it's appropriate to grant this exemption for section 582(b)(1) of the FD&C Act since the firm will use a paper-based COI and COC documentation system.

³ Although the firm did not ask for relief from section 582(b)(4), OCBQ believes it's appropriate to grant this exemption for section 582(b)(4) of the FD&C Act since the firm will use a paper-based COI and COC documentation system.

⁴ Although the firm did not ask for relief from the Enhanced Drug Distribution Security requirements for interoperable, electronic, package-level product tracing, FDA believes it's appropriate to grant this exemption for this autologous product since the firm will use a paper-based COI and COC documentation system.

Appendices:

Appendix 1: Firm's Proposed Prescribing Information (PI)



BLA 125806.0.119
KRESLADI USPI-clear

Appendix 2: Firm's DSCSA Exemption Request



1-12-5-request-for-
a-waiver_19Feb2026



1-12-5-request-for-
a-waiver_23Feb2026



(b) (4)



BLA



BLA

b2l 125806_Response tc 125806_Response tc

Appendix 3: Firm's Proposed Carton and Container Labels



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ntainer-labels-kresla



draft-carton-and-co
ntainer-labels-kresla

Appendix 4: Firm's Complete Chain of Identity/Chain of Custody Overview



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trols.pdf

Appendix 5: Orphan Designation (16-5430) and Rare Pediatric Disease Designation (RPD-2018-194)



orphan-drug-appr
val.pdf



orphan-drug-transf
er.pdf



rare-ped-disease-gr
anted.pdf

Appendix 6: Forms and SOPs used to document the COI and COC Process



FORM-929723,
Commercial US HPC



FORM-929725,
Commercial US Drug



SOP-929818,
Commercial US Drug



SOP-929892,
Commercial US Trace



SOP-929894,
Commercial US HPC