November 9, 2023

Fujifilm Irvine Scientific
Amanda Cinquin
Regulatory Affairs Manager, Life Science
1830 E. Warner Ave
Santa Ana, California 92705

Re: K231804
Trade/Device Name: PRIME-XV FreezIS DMSO-Free MD
Regulation Number: 21 CFR 876.5885
Regulation Name: Tissue Culture Media For Human Ex Vivo Tissue And Cell Culture Processing Applications
Regulatory Class: Class II
Product Code: NDS
Dated: October 6, 2023
Received: October 6, 2023

Dear Amanda Cinquin:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device"

(https://www.fda.gov/media/99812/download) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (https://www.fda.gov/media/99785/download).
Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Maura Rooney -S

Digitally signed by Maura Rooney -S
Date: 2023.11.09 08:59:43 -05'00'

Maura Rooney
Assistant Director
DHT3A: Division of Renal,
Gastrointestinal, Obesity
and Transplant Devices
OHT3: Office of Gastrorenal, ObGyn,

General Hospital, and Urology Devices
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 07/31/2026
See PRA Statement below.

Submission Number *(if known)*

K231804

Device Name

PRIME-XV FreezIS DMSO-Free MD

Indications for Use *(Describe)*

PRIME-XV FreezIS DMSO-Free MD is for use in human ex vivo tissue and cell culture processing applications.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

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FUJIFILM
Value from Innovation

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510(k) Summary

Submitter:	FUFJIFILM Irvine Scientific, Inc.
Address:	1830 E. Warner Avenue, Santa Ana, CA 92705. USA Phone: 949 261 7800
Contact Person:	Amanda Cinquin
Date of Preparation:	05/20/2023
Trade Name:	PRIME-XV FreezIS DMSO-Free MD
Common Name:	Culture Media
Classification Name:	Media, Culture, ex vivo, Tissue and Cell
Regulation Name:	Tissue culture media for human ex vivo tissue and cell culture processing applications
Regulatory Class:	II
Product Code:	NDS
Regulation Number:	21 CFR 876.5885
Panel:	Gastroenterology/Urology
Legally Marketed Devices for Substantial Equivalence Comparison:	AIM-V® Medium, Invitrogen Corporation, 510(k) K022086 Invitrogen Corporation. CT-STOR medium for ex vivo cell preservation, Energy Delivery Solutions, 510(k) K201789 Energy Delivery Solutions.

Device Description:

PRIME-XV FreezIS DMSO-Free MD is a liquid medium intended for use in human ex vivo tissue and cell culture processing applications.
It is a chemically defined cryogenic preservation solution for human cells for use in a professional Healthcare Facility that performs cell culture and cell handling. It has comparable post-thaw cell viability as solutions containing dimethyl sulfoxide (DMSO), maintains potency of stem cells throughout cryopreservation, eliminates the risk of DMSO in stem cell therapy applications, is animal component-free, enables cell preservation at -80°C to -196°C environments and is manufactured under cGMP conditions.

Intended Use:
PRIME-XV FreezIS DMSO-Free MD is for use in human ex vivo tissue and cell culture processing applications.

Indications for Use:
Indications for use are the same as the intended use.

Technological Characteristics:
PRIME-XV FreezIS DMSO-Free MD was developed in 2014 and is a serum-free medium with a defined formulation. PRIME-XV FreezIS DMSO-Free MD, and predicates AIM-V® and CT-STOR, are for use in human ex vivo tissue and cell culture processing applications. They are chemically defined tissue culture media used to support the growth or maintenance of human tissue or cells in culture.

AIM-V® is a cell culture medium that is used for expansion of cells. PRIME-XV FreezIS DMSO-Free MD and CT-STOR support cells for ex vivo preservation, in the case of PRIME-XV FreezIS DMSO-Free MD, preservation is cryogenic.

PRIME-XV FreezIS DMSO-Free MD, AIM-V® and CT-STOR are formulated based on cell requirements for amnio acids, salts, and other components required for ex vivo maintenance of cells and tissues.

AIM-V® is supplemented with human serum albumin, which is known to be fractionated from plasma still bound to many components that are important for cell growth and maintenance. PRIME-XV FreezIS DMSO-Free MD is chemically defined and human- and animal-derived component free and does not include human serum albumin. Therefore, it also contains in the formulation components that are needed for cell growth and maintenance that would normally be provided by the addition of human serum albumin.

PRIME-XV FreezIS DMSO-Free MD contains a cryoprotectant (CPA) to preserve cells under cryogenic storage. The CPA acts to protect the cells from osmotic changes or ice crystal formation. Common CPA dimethyl sulfoxide (DMSO) is a small molecule penetrating CPA that acts by entering the cell and preserving it by reducing ice crystal formation during freeing and by regulating salt concentration. However, DMSO has been shown to have some negative effects such as inducing epigenetic changes in cells [Murray & Gibson, 2022, Nature Reviews Chemistry 6, 579-593]. Therefore, PRIME-XV FreezIS DMSO-

Free MD was developed with a proprietary CPA as an alternative to DMSO, but that has comparable performance.

The specifications for PRIME-XV FreezIS DMSO-Free MD are substantially equivalent to AIM-V® including pH, osmolality and storage temperature.

A comparison of device technology between PRIME-XV FreezIS DMSO-Free MD and AIM-V® is listed in the table below.

Description	PRIME-XV FreezIS DMSO-Free MD	Primary Predicate AIMV® K022086
Intended Use	Liquid tissue culture product intended for ex vivo tissue and cell culture processing applications	Same as subject
Prescription/over the counter use	Prescription	Same as subject
Constituents	Amino acids, energy source, macromolecules to support cell growth and maintenance	Same as subject
Additional components included	Cryoprotectant	Human serum albumin
Sterility	Sterile filtered, aseptically filled, sterility release test	Same as subject
Presence of serum	Serum-free	Same as subject
Storage	2 – 8 ^{o}C	Same as subject
Stability	24 months	14 months

A comparison of device specification between PRIME-XV FreezIS DMSO-Free MD and AIM-V® is listed in the table below.

	Specification	
Test	**PRIME-XV FreezIS DMSO-Free MD**	**Primary Predicate AIM-V® K022086**
Performance assay	PASS (cell culture assay)	Same as subject
Endotoxin testing	0.0 - 1.0 EU/mL	Same as subject
Mycoplasma	PASS	Same as subject
pH	6.4 - 8.0	6.8 - 7.3
Osmolality mOsm/kg	300 - 380	310 - 340
Sterility	PASS	Same as subject

Performance Testing:

Performance Standards

Special Controls identified in the FDA document, "Tissue Culture Media for Human ex vivo Tissue and Cell Culture Processing Applications – Final Class II Special Controls Guidance Document for Industry and FDA Reviewers" are addressed in the table below.

Special Control Objective	PRIME-XV FreezIS DMSO-Free MD
Demonstrate lack of potential toxicity of materials in the media to cells or tissue and demonstrate support of tissue and cell growth	High cell viability, robust cell expansion post-cryopreservation, maintenance of cell function, phenotype and differentiation potential.
Demonstrate lack of endotoxin or pyrogen contamination	Endotoxin testing per USP <85>, mycoplasma testing per USP <63>
Validation of Aseptic Processing and Sterility Assurance Level (SAL)	Compliance with GMP requirements regarding aseptic processing.
Demonstrates chemical purity	Incoming raw materials are of high quality and are lot-tested for identity and purity.

Stability/Shelf Life

Based on analysis of product performance over time, a 24-month shelf life has been established for PRIME-XV FreezIS DMSO-Free MD when stored at 2 – 8 °C. Stability testing involved the assessment of functional aspects of the media to demonstrate that pH and osmolality were maintained, demonstrating that the media was not chemically altered during storage, and that the media was not cytotoxic and continued to maintain cells at high viability and to support cell expansion post-thaw. In addition, pyrogen and sterility testing confirmed that the container/closure provided protection against microbial contamination during storage.

Conclusions

PRIME-XV FreezIS DMSO-Free MD, AIM-V® and CT-STOR are used for human ex vivo tissue and cell culture processing applications and have substantially the same technological characteristics, efficacy (generic cell growth and maintenance; post-cryopreservation cell growth is substantially equivalent to AIM-V®) and safety (consistency in chemical content and formulation, biocompatibility with cells, and purity). The efficacy of PRIME-XV FreezIS DMSO-Free MD in supporting the survival, growth, development and/or maintenance of human cells or tissue culture systems has been well established in data and scientific publication included in this submission. PRIME-XV FreezIS DMSO-Free MD, AIM-V® and CT-STOR are manufactured in accordance with QSR requirements and are labeled as aseptically processed. Thus PRIME-XV FreezIS DMSO-Free MD is substantially equivalent to the legally marketed predicate devices

intended for human ex vivo tissue and cell culture processing applications.