DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Food and Drug Administration
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May 12, 2017

Genea Biomedx Pty Ltd.
% Roger Gray
VP, Quality and Regulatory
Donawa Lifescience Consulting Srl
Piazza Albania 10
Rome, 00153
Italy

Re: K161261
Trade/Device Name: Gems Fertilisation Medium, Gems Cleavage Medium, Gems Blastocyst Medium, Gems Geri Medium, Gems VitBase
Regulation Number: 21 CFR§ 884.6180
Regulation Name: Reproductive Media and Supplements
Regulatory Class: II
Product Code: MQL
Dated: April 25, 2017
Received: April 28, 2017

Dear Roger Gray:

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 (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. 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.

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 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801, please contact the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Benjamin R. Fisher -S

Benjamin R. Fisher, Ph.D.
Director
Division of Reproductive, Gastro-Renal,
and Urological Devices
Office of Device Evaluation
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: January 31, 2017
See PRA Statement below.

510(k) Number *(if known)*
K161261

Device Name
Gems Fertilisation Medium, Gems Cleavage Medium, Gems Blastocyst Medium, Gems Geri Medium, and Gems VitBase

Indications for Use *(Describe)*

Gems Fertilisation Medium is used to provide a suitable environment for both oocytes and sperm and support in vitro fertilisation. This medium can be used for transfer of zygotes into the uterus.

Gems Cleavage Medium is for in vitro culture of embryos following fertilization to the 4-8 cell stage. This medium can be used for transfer of cleavage stage embryos into the uterus.

Gems Blastocyst Medium is for in vitro culture of embryos from the cleavage stage to the blastocyst stage of development. This medium can be used for transfer of blastocyst stage embryos into the uterus.

Gems Geri Medium is for in vitro culture of embryos from fertilization to the blastocyst stage of development. This medium can be used for transfer of embryos into the uterus.

Gems VitBase is used to maintain embryos for a short period of time in a non-gassed environment during embryo vitrification and warming procedures. The embryos can be placed in this medium for a maximum of 10 minutes.

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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510(k) Summary

I. General Information on Submitter

Submitter/Address:	Genea Biomedx Pty Ltd Level 2, 321 Kent Street Sydney NSW 2000 Australia
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II. Date Prepared:

May 11, 2017

III. General Information on Devices

Device Name:	Gems Fertilisation Medium, Gems Cleavage Medium, Gems Blastocyst Medium, Gems Geri Medium, and Gems VitBase
Common Name:	Embryo Culture Media
Classification Name:	Reproductive Media and Supplements (21 CFR 884.6180)
Product code:	MQL (Media, Reproductive)
Regulatory Class:	II

IV. Predicate Devices

1. Sydney IVF Fertilization Medium, Sydney IFV Cleavage Medium and Sydney IVF Blastocyst Medium (K153290), manufactured by William A. Cook Australia Pty Ltd
2. G-TI (K133568), manufactured by Vitrolife, Inc.
3. Cook Sydney IVF Blastocyst Vitrification Kit, Cook Sydney IVF Blastocyst Warming Kit (K143724), manufactured by William A. Cook Australia Pty Ltd

These predicate devices have not been subject to any design related recalls.

V. Device Description

The subject devices are culture media consisting of salts, energy substrates, amino acids, buffering agents, nutrients supplements and antibiotics, with or without L-Carnitine and/or human serum albumin. These devices have different applications in Assisted Reproduction Technology (ART) procedures in a hospital environment, as follows:

- The Gems Fertilisation Medium is intended for in vitro fertilization and transfer of embryos to the uterus.
- The Gems Cleavage Medium is intended for culture of embryos from fertilization to cleavage stage and transfer of embryos to the uterus.

The Gems Blastocyst Medium is intended for culture of embryos from cleavage stage to blastulation stage and transfer of embryos to the uterus.

- The Gems Geri Medium is intended for culture of embryos from fertilization to blastulation stage and transfer of embryos to the uterus.

- The Gems VitBase is intended for culture of embryos (up to 10 minutes) during embryo vitrification/warming procedures.

These media are single-use devices that are aseptically filled into the sterilized bottles and have a sterility assurance level (SAL) of 10^{-3}. The products are tested for pH, osmolality, embryotoxicity, endotoxin, and sterility before lot release.

VI. Indications for Use:

Devices	**Indications for Use**
Gems Fertilisation Medium	Gems Fertilisation Medium is used to provide a suitable environment for both oocytes and sperm and support in vitro fertilisation. This medium can be used for transfer of zygotes into the uterus.
Gems Cleavage Medium	Gems Cleavage Medium is for in vitro culture of embryos following fertilization to the 4-8 cell stage. This medium can be used for transfer of cleavage stage embryos into the uterus.
Gems Blastocyst Medium	Gems Blastocyst Medium is for in vitro culture of embryos from the cleavage stage to the blastocyst stage of development. This medium can be used for transfer of blastocyst stage embryos into the uterus.
Gems Geri Medium	Gems Geri Medium is for in vitro culture of embryos from fertilization to the blastocyst stage of development. This medium can be used for transfer of embryos into the uterus.
Gems VitBase	Gems VitBase is used to maintain embryos for a short period of time in a non-gassed environment during embryo vitrification and warming procedures. The embryos can be placed in this medium for a maximum of 10 minutes.

VII. Comparison of Intended Use and Technological Characteristics of Subject and Predicate Devices

Device/Predicate Devices	Subject device – Gems Fertilisation Medium	Predicate device – Sydney IVF Fertilization Medium (K153290)
Indications for Use	Gems Fertilisation Medium is used to provide a suitable environment for both oocytes and sperm and support in vitro fertilization. This medium can be used for transfer of zygotes into the uterus.	Sydney IVF Fertilization Medium is intended for use during in vitro procedures for insemination and incubation of oocytes.
pH	7.5-7.7	Similar
Osmolality	295-305 mOsm/kg	Similar
Formulation	Base formulations are comparable, while the subject device contains additional ingredients.	
The subject and predicate devices have the similar indications – culture media for in vitro fertilization. The subject device is also indicated for transfer of zygotes into the uterus, while the predicate device is not indicated for transfer procedures. This difference does not represent a new intended use as both devices are for the treatment of infertility which requires transfer of embryos into the uterus, and is in-line with other devices cleared under this regulation/product code that are used for both culture and embryo transfer. The subject and predicate devices have comparable base formulations; however, the subject device includes additional ingredients. In addition, the pH, osmolality, MEA, endotoxin and sterility specifications for the subject and predicate devices are comparable. The differences in formulation noted above do not raise different questions of safety or effectiveness.		

Device/Predicate Devices	Subject device – Gems Cleavage Medium	Predicate device – Sydney IVF Cleavage Medium (K153290)
Indications for Use	Gems Cleavage Medium is for in vitro culture of embryos following fertilization to the 4-8 cell stage. This medium can be used for transfer of cleavage stage embryos into the uterus.	Sydney IVF Cleavage Medium is intended for use during in vitro fertilization procedures for culture and transfer of cleavage stage embryos.
pH	7.4-7.6	Similar
Osmolality	285-295 mOsm/kg	Similar
Formulation	Base formulations are comparable, while the subject device contains additional ingredients.	
The subject and predicate devices have similar indications – culture of embryos from fertilization to the cleavage stage of development and transfer of cleavage stage embryos into the uterus. However, the predicate device can also be used for in vitro fertilization procedures, which is different than the subject device. This narrower indication for the subject device does not represent a new intended use. The subject and predicate devices have comparable base formulations; however, the subject device includes additional ingredients. In addition, the pH, osmolality, MEA, endotoxin and sterility specifications for the subject and predicate devices are comparable. The differences in formulation noted above do not raise different questions of safety or effectiveness.		

Device/Predicate Devices	Subject device – Gems Blastocyst Medium (K161261)	Predicate device – Sydney IVF Blastocyst Medium (K153290)
Indications for Use	Gems Blastocyst Medium is for in vitro culture of embryos from the cleavage stage to the blastocyst stage of development. This medium can be used for transfer of blastocyst stage embryos into the uterus.	Sydney IVF Blastocyst Medium is intended for use during in vitro fertilization procedures for extended culture and transfer of embryos.
pH	7.6-7.80	Similar
Osmolality	285-295 mOsm/kg	Similar
Formulation	Base formulations are comparable, while the subject device contains additional ingredients.	
The subject and predicate devices have the similar indications – in vitro culture of embryos from cleavage stage to blastocyst stage and transfer of embryos to the uterus. Unlike the predicate device, the subject device is not intended for in vitro fertilization, representing a narrower indication but not a new intended use. The subject and predicate devices have comparable base formulations; however, the subject device includes additional ingredients. In addition, the pH, osmolality, MEA, endotoxin and sterility specifications for the subject and predicate devices are comparable. The differences in formulation noted above do not raise different questions of safety or effectiveness.		

Device/Predicate Devices	Subject device – Gems Geri Medium	Predicate device – G-TL (K133568)
Indications for Use	Gems Geri Medium is for in vitro culture of embryos from fertilization to the blastocyst stage of development. This medium can be used for transfer of embryos into the uterus.	Medium for culture of embryos from fertilization to blastocyst stage.
pH	7.4-7.6	7.2-7.4
Osmolality	285-295 mOsm/kg	265-275 mOsm/kg
Formulation	Base formulations are comparable, while the subject device contains additional ingredients and does not include some ingredients that are present in the predicate device.	
The subject and predicate devices have similar indications – in vitro culture of embryos from fertilization to blastocyst stage. The subject device is also indicated for transfer of blastocysts into the uterus, while the predicate device is not indicated for transfer procedures. This difference does not represent a new intended use as both devices are for the treatment of infertility which requires transfer of embryos into the uterus, and is in-line with other devices cleared under this regulation/product code that are used for both culture and embryo transfer. The subject and predicate devices have comparable base formulations. However, the subject device includes additional ingredients and does not contain some ingredients that are present in the predicate device formulation. In addition, the pH, osmolality, MEA, endotoxin and sterility specifications for the subject and predicate devices are		

comparable. The differences in formulation noted above do not raise different questions of safety or effectiveness.

Device & Predicate Device(s):	Subject device – Gems VitBase	Predicate device – Cryobase solution included in Cook Sydney IVF Blastocyst Vitrification Kit and COOK Sydney IVF Blastocyst Warming Kit (K143724)
Indications for Use	Gems VitBase is used to maintain embryos for a short period of time in a non-gassed environment during embryo vitrification and warming procedures. The embryos can be placed in this medium for a maximum of 10 minutes.	Blastocyst Vitrification Kit is intended for the vitrification of human blastocysts for assisted reproduction technologies (ART). This kit is designed for use with Blastocyst Warming Kit. Blastocyst Warming Kit is intended for the warming of human blastocysts that have undergone vitrification using COOK Sydney IVF Vitrification Kit for ART procedures.
pH	7.3-7.5	7.3-7.5
Osmolality	295-305 mOsm/kg	285-295 mOsm/kg
Formulation	Base formulations are comparable, while the subject device does not contain gentamicin that is present in the subject device.	
The subject device and the Cryobase solution in the predicate devices have similar indications – temporary culture of embryos during embryo vitrification/warming procedures. Therefore, the subject and predicate devices have comparable intended uses. The subject and predicate devices have comparable base formulations; however, the subject device does not contain gentamicin that is present in the predicate device formulation. In addition, the pH, osmolality, MEA, endotoxin and sterility specifications for the subject and predicate devices are comparable. The differences in formulation noted above do not raise different questions of safety or effectiveness.		

In addition to pH and osmolality, the specifications for MEA, endotoxin, and sterility for each version of the subject device are comparable to that of their respective predicate device.

VIII. Summary of Non-clinical Performance Testing

The following studies have been performed to support substantial equivalence to the predicate devices:

- pH
- Osmolality
- Aseptic Processing Validation testing that met the requirements in ISO 13408-2:2003
- Sterility testing per USP <71>
- Endotoxin testing per USP <85>
- Mouse embryo assay (MEA)

  One-cell mouse embryos were exposed to subject devices and cultured at 37°C in an atmosphere containing 5% CO_2. The percent of embryos developed to the expanded blastocyst stage within 96 hours were assessed in comparison with the control group.
- Biocompatibility studies, as follows:
  * Cytotoxicity testing per 10993-5:2009
  * Guinea Pig Maximization Sensitization testing per ISO 10993-10:2010
  * Intracutaneous Reactivity testing per ISO 10993-10:2010
  * Genotoxicity testing – Bacterial Reverse Mutation Assay per ISO 10993-3:2003
  * Genotoxicity testing – Mouse Lymphoma Assay per ISO 10993-3:2014
- Shelf-life studies (real-time and accelerated) were conducted to ensure that the following product specifications are met at time zero and the end of shelf-life.
  * pH – See tables above

* Osmolality – See tables above
* 1-cell MEA – ≥80% developed to the blastocyst stage at 96 hours
* Endotoxin – <0.4 EU/ml (LAL)
* Sterility – No microbiological growth

IX. Summary of Clinical Performance Testing

A controlled, double-blinded, single-site clinical trial was conducted at the Genea Clinic (Sydney, Australia) to evaluate the safety and effectiveness of the subject devices. The comparator devices used in this study were Genea in-house media. However, for the purpose of determining substantial equivalence, the results of the subject media were compared to the published literature and the Assisted Reproductive Technology National Summary Report published by the Centers for Disease Control and Prevention (CDC).

In the test group, a total of 641 embryos were used in 569 embryo transfer procedures. In the control group, a total of 598 embryos were used in 531 embryo transfer procedures. The primary endpoint was pregnancy rate as indicated by fetal heartbeat at 6-8 weeks post-embryo transfer. The secondary endpoints were fertilization rate, cleavage rate and blastulation rate. The additional analysis was live birth rate. The pregnancy rate and live birth rate were evaluated based on patient ages and compared to the CDC data. The secondary outcomes were compared with the literature reports. Data analysis was based on the outcome of all embryos transferred.

The results demonstrated that the primary endpoint of pregnancy rate was comparable to CDC data whereas the secondary endpoints of fertilization rate, cleavage rate and blastulation rate were comparable to those found in the published literature. Finally, the live birth rate was also comparable to CDC data.

X. Conclusion

The subject and predicate devices have the same intended uses. Although there are differences in technological characteristics between the subject and predicate devices, these differences do not raise different questions of safety or effectiveness. The performance data demonstrate that the subject devices are substantially equivalent to the predicate devices.