

Data Sheet

hERG1a/1b Inducible HEK293 Cell Line

Immortalized Cell Line

SCC295**Pack Size $\geq 1 \times 10^6$ viable cells/vial****Store in liquid nitrogen****FOR RESEARCH USE ONLY****Not for use in diagnostic procedures. Not for human or animal consumption.**

Background

HERG channel inhibition assays for preclinical cardiac safety screening of new drug compounds use electrophysiological methodology and employ hERG-expressing recombinant cell lines. Despite evidence that the cardiac IKr potassium current is produced by heteromeric hERG1a/1b channels,^{1, 2, 3} drug screening assays have long relied on homomeric hERG1a alone, because of the instability of hERG 1b expression in so-called "stable" recombinant cell lines.⁴ The novel inducible hERG1a/1b heteromeric cell line offers an improved tool for preclinical cardiac toxicity screening, by enabling more accurate predictions of off-target drug effects on cardiac IKr, particularly in computational models relying on accurate IC₅₀ measurements. hERG1a/1b cells also can facilitate the study of heteromeric assembly of the hERG 1a and 1b subunits during biogenesis.⁵

Source

The heteromeric hERG1a/1b Inducible HEK293 cell line, in which hERG1b protein expression is tightly controlled by doxycyclin dose and treatment time, was derived from a homomeric hERG 1a expressing HEK293 cell line.⁵

Short Tandem Repeat (STR) Profile

D3S1358:	15, 17	D7S820	11, 12	FGA:	23
TH01:	7, 9.3	D16S539:	9, 13	Amel:	X
D21S11:	28, 30.2	CSF1PO:	11, 12		
D18S51:	17, 18	Penta D:	9, 10		
Penta E:	7, 15	vWA:	16, 19		
D5S818:	8, 9	D8S1179:	12, 14		
D13S317:	12	TPOX:	11		

hERG1a/1b Inducible HEK293 cells are genetically modified.

Quality Control Testing

- Each vial contains $\geq 1 \times 10^6$ viable cells.
- Cells are tested negative for infectious diseases by a Human Essential CLEAR panel by Charles River Animal Diagnostic Services.
- Cells are verified to be of human origin and negative for inter-species contamination from mouse, rat, Chinese hamster, Golden Syrian hamster, and Non-human Primate (NHP) as assessed by a Contamination Clear panel by Charles River Animal Diagnostic Services.
- Cells are negative for mycoplasma contamination.

Storage and Handling

hERG1a/1b Inducible HEK293 cells should be stored in liquid nitrogen. The cells can be cultured for at least 10 passages after initial thawing without significantly affecting functionality.

Representative Data

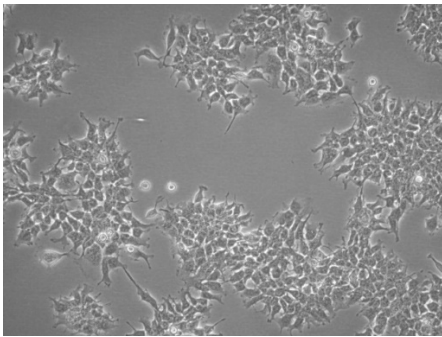


Figure 1. Bright-field images of hERG1a/1b Inducible HEK293 cells in culture, two days after thaw.

Protocols

Thawing the Cells

1. Do not thaw the cells until the recommended medium is on hand. Cells can grow on normal tissue cultureware surfaces without any additional coating.
Cells are thawed and expanded in hERG1a/1b Inducible HEK293 Expansion Medium comprising High Glucose DMEM (SLM-120-B) with 10% FBS (ES-009-B), and selection antibiotic 5 $\mu\text{g/mL}$ Geneticin (G418) and 0.25 $\mu\text{g/mL}$ Puromycin.
2. Remove the vial of frozen hERG1a/1b Inducible HEK293 cells from liquid nitrogen and incubate in a 37 °C water bath. Closely monitor until the cells are completely thawed. Maximum cell viability is dependent on the rapid and complete thawing of frozen cells.
IMPORTANT: Do not vortex the cells.
3. As soon as the cells are completely thawed, disinfect the outside of the vial with 70% ethanol. Proceed immediately to the next step.
4. In a laminar flow hood, use a 1 or 2 mL pipette to transfer the cells to a sterile 15 mL conical tube. Be careful not to introduce any bubbles during the transfer process.
5. Using a 10 mL pipette, slowly add dropwise 9 mL of hERG1a/1b Inducible HEK293 Expansion Medium (Step 1 above) to the 15 mL conical tube.
IMPORTANT: Do not add the entire volume of media all at once to the cells. This may result in decreased cell viability due to osmotic shock.

6. Gently mix the cell suspension by slowly pipetting up and down twice. Be careful not to introduce any bubbles.

IMPORTANT: Do not vortex the cells.

7. Centrifuge the tube at 300 x *g* for 2-3 minutes to pellet the cells.
8. Decant as much of the supernatant as possible. Steps 5-8 are necessary to remove residual cryopreservative (DMSO).
9. Resuspend the cells in 15 mL of hERG1a/1b Inducible HEK293 Expansion Medium.
10. Transfer the cell mixture to a T75 tissue culture flask.
11. Incubate the cells at 37 °C in a humidified incubator with 5% CO₂.

Subculturing the Cells

1. hERG1a/1b Inducible HEK293 cells should be passaged at ~ 80-85% confluency. Do not allow the cells to grow over 85% confluency.
2. Carefully remove the medium from the T75 tissue culture flask containing the 80% confluent layer of hERG1a/1b Inducible HEK293 cells.
3. Rinse the flask with 10 mL 1X PBS. Aspirate after the rinse.
4. Apply 5-7 mL of Accutase® and incubate in a 37 °C incubator for 3-5 minutes.
5. Inspect the flask and ensure the complete detachment of cells by gently tapping the side of the flask with the palm of your hand.
6. Add 5-7 mL of hERG1a/1b Inducible HEK293 Expansion Medium to the plate.
7. Gently rotate the flask to mix the cell suspension. Transfer the dissociated cells to a 15 mL conical tube.
8. Centrifuge the tube at 300 x *g* for 3-5 minutes to pellet the cells.
9. Discard the supernatant, then loosen the cell pellet by tapping the tip of the tube with a finger.
10. Apply 2-5 mL of hERG1a/1b Inducible HEK293 Expansion Medium to the conical tube and resuspend the cells thoroughly.

IMPORTANT: Do not vortex the cells.

11. Count the number of cells using a hemocytometer.
12. Plate the cells to the desired density. Typical split ratio is 1:6.

hERG 1b Induction

Add doxycycline to hERG1a/1b Inducible HEK293 Expansion Medium at desired concentration; suggested range 100-200 ng/mL.

Cryopreservation of Cells

hERG1a/1b Inducible HEK293 cells may be frozen in hERG1a/1b Inducible HEK293 Expansion Medium and 10% DMSO using a Nalgene® slow freeze Mr. Frosty™ container.

References

1. *J Biol Chem* 2004, 279(43): 44690–44694.
2. *Circ Res* 2008, 103(7): e81–e95.
3. *PNAS* 2014, 111(50): 18073-18077.
4. *Br J Pharmacol* 2011, 164(2b): 419-432.
5. *Biophysical J* 2018, Volume 114, Issue 3, Suppl 1, 2 (292a) (Poster Abstract).

Academic Use Agreement

(Subject to local law)

THIS PRODUCT MAY ONLY BE USED BY INDIVIDUALS EMPLOYED BY AN ACADEMIC INSTITUTION AND IS INTENDED SOLELY TO BE USED FOR ACADEMIC RESEARCH, WHICH IS FURTHER DEFINED BELOW. BY OPENING THIS PRODUCT, YOU ("PURCHASER") HEREBY REPRESENT THAT YOU HAVE THE RIGHT AND AUTHORITY TO LEGALLY BIND YOURSELF AND/OR YOUR EMPLOYER INSTITUTION, AS APPLICABLE, AND CONSENT TO BE LEGALLY BOUND BY THE TERMS OF THIS ACADEMIC USE AGREEMENT. IF YOU DO NOT AGREE TO COMPLY WITH THESE TERMS, YOU MAY NOT OPEN OR USE THE PRODUCT AND YOU MUST CALL MILLIPORESIGMA ("SELLER") CUSTOMER SERVICE (1-800-645-5476) TO ARRANGE TO RETURN THE PRODUCT FOR A REFUND.

"Product" means hERG1a/1b Inducible HEK293 Cell Line (SCC295).

"Academic Research" means any internal *in vitro* research use by individuals employed by an academic institution. Academic Research specifically excludes the following uses of whatever kind or nature:

- Re-engineering or copying the Product
- Making derivatives, modifications, or functional equivalents of the Product
- Obtaining patents or other intellectual property rights claiming use of the Product
- Using the Product in the development, testing, or manufacture of a Commercial Product
- Using the Product as a component of a Commercial Product
- Reselling or licensing the Product
- Using the Product in clinical or therapeutic applications including producing materials for clinical trials
- Administering the Product to humans
- Using the Product in collaboration with a commercial or non-academic entity

"Commercial Product" means *any* product intended for: (i) current or future sale; (ii) use in a fee-for-service; or (iii) any diagnostic, clinical, or therapeutic use.

Access to the Product is limited solely to those officers, employees, and students of PURCHASER's academic institution who need access to the Product to perform Academic Research. PURCHASER shall comply with all applicable laws in its use and handling of the Product and shall keep it under reasonably safe and secure conditions to prevent unauthorized use or access.

These use restrictions will remain in effect for as long as PURCHASER possesses the Product.

COMMERCIAL OR NON-ACADEMIC ENTITIES INTERESTED IN PURCHASING OR USING THE PRODUCT MUST CONTACT licensing@milliporesigma.com AND AGREE TO SEPARATE TERMS OF USE PRIOR TO USE OR PURCHASE.

GMO

This product contains genetically modified organisms.

Este producto contiene organismos genéticamente modificados.

Questo prodotto contiene degli organismi geneticamente modificati.

Dieses Produkt enthält genetisch modifizierte Organismen.

Ce produit contient des organismes génétiquement modifiés.

Dit product bevat genetisch gewijzigde organismen.

Tämä tuote sisältää geneettisesti muutettuja organismeja.

Denna produkt innehåller genetiskt ändrade organismer.

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at SigmaAldrich.com/techservice.

Terms and Conditions of Sale

Warranty, use restrictions, and other conditions of sale may be found at SigmaAldrich.com/terms.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the U.S. and Canada.

Merck and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates.
All other trademarks are the property of their respective owners. Detailed information on
trademarks is available via publicly accessible resources.

© 2021-2025 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

Document Template 20306518 Version 6.0

20577717 Ver 2.0, Rev 15OCT2025, ab

The Merck logo, consisting of the word "MERCK" in a bold, red, sans-serif font.