

General information

Description The RBL-2H3 cell line has become a valuable tool for studying mast cell physiology. RBL-2H3 cells express rat mast cell protease II (RMCP-II) and the c-kit receptor tyrosine kinase, making them a potential model for mast cells. However, conflicting and sometimes misleading data about RBL-2H3 cells have been reported. RBL-2H3 cells have been widely used to investigate various aspects of mast cell function, including degranulation, mast cell stabilizers, and the interaction of FcεRI receptors with the cytoskeleton. They express high-affinity IgE receptors and can be activated to secrete histamine and other mediators. Cultivating RBL-2H3 cells is relatively easy, and longer culturing times result in higher cell density. Degranulation is a key feature of RBL-2H3 cells, similar to mast cells and basophils. When allergens crosslink their IgE-bound FcεRI receptors, RBL-2H3 cells release preformed and newly synthesized mediators, contributing to immune allergic responses. The degranulation of RBL-2H3 cells has provided insights into basophil degranulation as well. These cells can also undergo degranulation in response to non-immunological stimuli, and there are differences between MMC, RBL-2H3, and CTMC. The role of calcium in RBL-2H3 cell degranulation is significant. The calcium ionophore A23187, which increases intracellular calcium levels, induces degranulation in RBL-2H3 cells, similar to mast cells and basophils. Some studies have described RBL-2H3 cells as a serotonin-releasing cell line.

Organism Rat

Tissue Peripheral blood

Disease Rat leukemia

Synonyms RBL2H3, RBL 2H3, RBL.2H3

Characteristics

Morphology Fibroblast

Growth properties Adherent

Identifiers / Biosafety / Citation

Citation RBL-2H3 (Cytion catalog number 305194)

Biosafety level 1

Expression / Mutation

Handling

RBL-2H3 | 305194

Culture Medium EMEM

Medium supplements 10% FBS, w: 2 mM L-Glutamine, w: 1.5 g/L NaHCO₃, w: EBSS, w: 1 mM Sodium pyruvate, w: NEAA

Passaging solution Accutase

Subculturing Remove medium and rinse the adherent cells using PBS without calcium and magnesium (3-5 ml PBS for T25, 5-10 ml for T75 cell culture flasks). Add Accutase (1-2 ml per T25, 2.5 ml per T75 cell culture flask), the cell sheet must be covered completely. Incubate at ambient temperature for 8-10 minutes. Carefully resuspend the cells with medium (10 ml), centrifuge for 3 min at 300 g, resuspend cells in fresh medium and dispense into new flasks which contain fresh medium.

Split ratio 1:2 to 1:4

Fluid renewal 2 to 3 times per week

Freeze medium CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

Handling of cryopreserved cultures The cells come deep-frozen shipped on dry ice. Please make sure that the vial is still frozen. If immediate culturing is not intended, the cryovial must be stored below -150 degree Celsius after arrival. If immediate culturing is intended, please follow the below instructions: Quickly thaw by rapid agitation in a 37 degree Celsius water bath within 40-60 seconds. The water bath should have clean water containing an antimicrobial agent. As soon as the sample has thawed, remove the cryovial from the water bath. A small ice clump should still remain and the vial should still be cold. From now on, all operations should be carried out under aseptic conditions. Transfer the cryovial to a sterile flow cabinet and wipe with 70% alcohol. Carefully open the vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of culture medium (room temperature). Resuspend the cells carefully. Centrifuge at 300 x g for 3 min and discard the supernatant. The centrifugation step may be omitted, but in this case the remains of the freeze medium have to be removed 24 hours later. Resuspend the cells carefully in 10 ml fresh cell culture medium and transfer them into two T25 cell culture flasks. All further steps are described in the subculture section.

Handling of proliferating cultures One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in 1 or 2 x 50 ml centrifuge tubes, respectively. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Control the cell morphology and confluency under the microscope. Incubate at 37 degree Celsius for a minimum of 24 hours. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Incubate at 37 degree Celsius for a minimum of 24 hours.

Quality control / Genetic profile / HLA

Sterility

Mycoplasma contaminations are ruled out through PCR-based and luminescence-based mycoplasma assays. The absence of bacterial, fungal or yeast contamination is controlled through daily visual cell monitoring.