Rat collagen type I

Cat. No.: B00-03A

Ver 1.0

Description

Collagen type I is the most abundant component of the extracellular matrix in animals, including humans. It is a key structural protein that provides strength and elasticity to connective tissues such as skin, bones, cartilage, and tendons. It consists of three polypeptide chains that form a triple helix structure, with two alpha-1 chains and one alpha-2 chain. These chains are stabilized by hydrogen bonds and disulfide bridges.

Due to its similarity to human collagen type I, rat tail collagen type I has been widely used in biomedical research. It can be used as a substrate for cell culture and a scaffold for tissue engineering, and as a model for studying collagen fibrillogenesis, which is the process of collagen molecules assembling into fibrils.

For cell culture, purified collagen solution can be coated on a dish and used to provide a natural environment for cell growth and attachment, allowing for more physiologically relevant studies. In tissue engineering, rat tail collagen type I can be used as a 3D scaffold to support the growth of new tissue, including repairing damaged tissues such as cartilage or bone, and creating artificial organs. Researchers can also use rat tail collagen type I as a model for studying collagen biology and the factors that influence collagen structure and function.

Rat Tail Collagen from Expercy is purified from the tails of no medication laboratory rats and provides researchers with reliable and high-quality collagen for cell culture and tissue engineering.

Specification

Endotoxin LAL	<10 EU/ml
Purity	≥ 95% by SDS PAGE
pH	2.0 – 4.0
Osmolality	≤ 35 mOsmo H_2O/Kg
Sterility	Sterile filtered
Cell Attachment	Pass
Product Type	Solution

Storage

2–8°C and protect from light. Do not freeze.

Precautions and Disclaimer

The product is for research use only and is not suitable for drug, household, diagnostic procedures or other applications. Please request the Safety Data Sheet for information regarding hazards and safe handling practices.

Gelling procedure

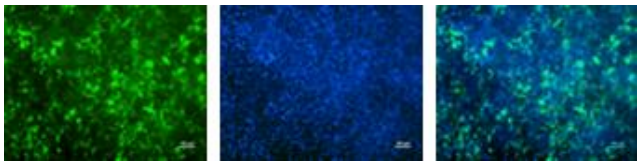
1. Cool the collagen solution and all buffers to 2 - 8°C.
2. Calculate the concentration and final volume of collagen to be used. See Example Calculation.
3. Calculate the amount of buffer needed so that collagen is at the desired concentration in 1X PBS or culture medium with normal osmolality and neutral pH. See Example Calculation.

Example Calculation

V_t=Total volume of collagen gel desired
Volume of collagen needed (V_1) = (Final conc. of collagen) x (Total Volume (V_t)) / Initial conc. of collagen
Volume of 10X PBS needed (V_2) = Total Volume (V_t) / 10
Volume of 1N NaOH need (V_3) = V_1 x 0.025
Volume of dH2O needed (V_4) = V_t – (V_1+V_2+V_3)

4. In a sterile tube, mix dH_2O, 1N NaOH, and buffer (Cooled 10 X PBS or culture media) at 2 - 8°C.
5. Slowly pipet the collagen into the tube, and gently pipet solution up and down to mix well. The resulting mixture should achieve a pH of 6.5-7.5. (optimal pH is 7.0).
6. Quickly transfer the collagen mixture to the desired plates or dishes and store them on ice. The mixture may solidify quickly at room temperature. Herein, cells could be seeded into the mixture
7. Incubate the neutralized collagen at 37°C cell culture incubator for 30-40 mins, or until the collagen forms a firm gel.
   Note: Do not disturb the gel during the gelation process.

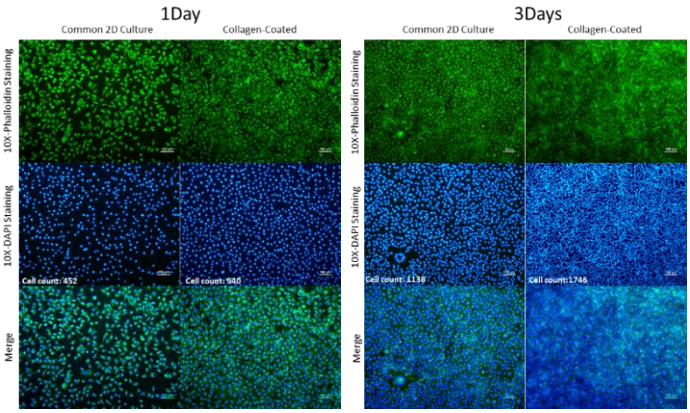
3D cell culture



Our 3D collagen gel mimic cell-ECM interaction and provide cells a network environment for growth, and proliferation. Cells suspended in this 3D system is easily to fix and stain cells directly within the matrix.

Coating procedure

1. Calculate the volume needed for experimentation.
2. Dilute collagen solution to 50-100 µg/mL using 0.01M HCl.
3. Add diluted collagen solution to coat dishes with 5-10 µg/cm^2.
4. Incubate at room temperature for 1 hours.
5. Carefully aspirate the remaining solution.
6. Rinse coated surface 3 times carefully with sterile PBS or serum-free medium to remove the acid.
7. The plate may be used immediately or air dried. They could be stored at 2-8°C for up to one week under sterile condition.



In 2D system, collagen coating provides a better proliferation, migration and spreading of cell and also promotes the cell morphology than untreated groups.