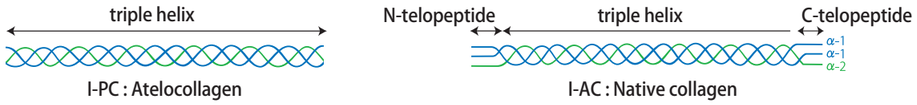
Collagen for Cell Culture
AteloCell®

Reference

1. Miyazaki K , *et al* . Cancer cell migration on elongate protrusions of fibroblasts in collagen matrix. (2019) *Sci Rep* . Jan 22;9(1):292
2. Akimoto N, *et al* . Transfection of T-Box Transcription Factor BRACHYURY and SOX2 Synergistically Promote Self Renewal and Invasive Phenotype in Oral Cancer Cells. (2018) *Int J Mol Sci* . Nov 16;19(11)
3. Eguchi R, *et al.* FK506 induces endothelial dysfunction through attenuation of Akt and ERK1/2 independently of calcineurin inhibition and the caspase pathway. (2013) *Cell Signal.* 2013 Sep;25(9):1731-1738.
4. Yonemura S. Differential sensitivity of epithelial cells to extracellular matrix in polarity establishment. (2014) *PLoS One.*Nov 13;9(11):e112922.

Molecular structure : atelocollagen and native collagen



Atelocollagen (I-PC) is produced by removing the antigenic telopeptide ends from native collagen by protease treatment. Atelocollagen retains the triple-helix structure and other properties of native collagen, though native collagen gels are slightly stiffer and more transparent.

Comparison : Collagen solution products

Product	Collagen type	Medium	Coating	Gel preparation	in vivo	Gelation rate/strength
Acidic solution I-PC	Atelo	–	◎	◎ Requires some practice	◎	I-AC > I-PC I-PC = 3D Ready Atelocollagen※ ※Slightly varies depending on the medium.
Acidic solution I-AC	Native	–	◎	◎ Requires some practice	△	
3D Ready Atelocollagen	Atelo	○	○	◎ Easy 3 step !	◎	

Cat. No.	Description	Quantity	Storage
KOU-IPC-30	Atelocollagen, Bovine dermis, 3 mg/mL	50 mL/btl	4℃
KOU-IPC-50	Atelocollagen, Bovine dermis, 5 mg/mL	50 mL/btl	4℃
KOU-IAC-30	Native collagen, Bovine dermis, 3 mg/mL	50 mL/btl	4℃
KOU-IAC-50	Native collagen, Bovine dermis, 5 mg/mL	50 mL/btl	4℃

Cat. No.	Description	Quantity	Storage
KOU-3D-LG01	3D Ready Atelocollagen, DMEM, Low Glucose	12 mL/btl	-20℃
KOU-3D-LG05	3D Ready Atelocollagen, DMEM, Low Glucose	12 mL/btl x5	-20℃
KOU-3D-HG01	3D Ready Atelocollagen, DMEM, High Glucose	12mL/btl	-20℃
KOU-3D-HG05	3D Ready Atelocollagen, DMEM, High Glucose	12 mL/btl x5	-20℃

World distributor

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Please don't hesitate to contact us with any questions related to product selection or use.

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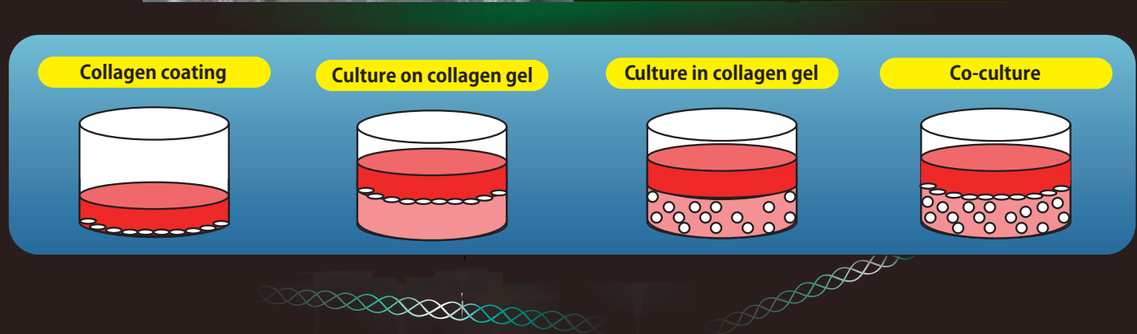
KOKEN

KOKEN

AteloCell® Collagen for Cell Culture

Atelocollagen/Native collagen acidic solution

3D Ready atelocollagen



Collagen for Cell Culture **AteloCell®**

KOKEN

Atelocollagen / Native collagen acidic solution

IPC-30/IPC-50 、IAC-30/IAC-50

3D Ready Atelocollagen

3D-LG01/LG05 、3D-HG01/HG05

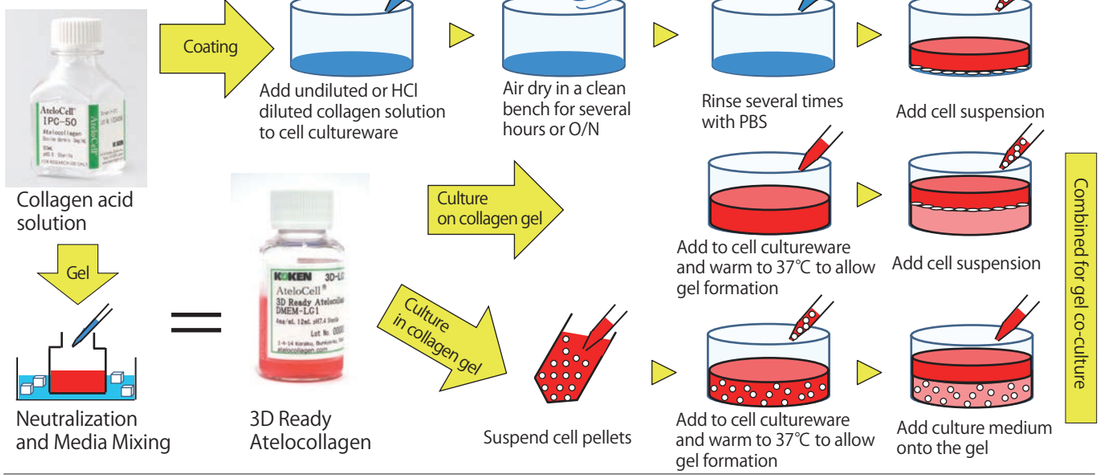
Product summary

These products are prepared with highly purified type I collagen derived from bovine dermis. The low pH of the acidic solutions enables long-term refrigerated storage. On the other hand, 3D Ready AteloGene®products are pH neutral, come premixed in DMEM media, and gel at 37℃. In contrast to cell-derived soluble basement membrane preparations, these collagen solutions are free from bioactive substances, nucleic acids, MMP, etc. allowing experimental results to be evaluated more clearly.

Applications

- Collagen coating for cell cultureware
- Cell culture on a collagen gel
- 3D cell culture in a collagen gel
- Co-culture of collagen gel

How to use

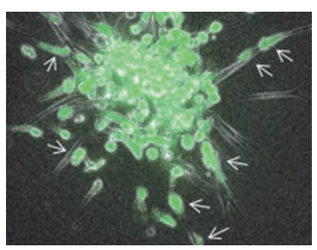


Example 1 Co-culture of cancer cells and fibroblasts using collagen gel

[Reference :(a) Sci Rep.2019 Jan 22;9(1):292. Created by modifying Figure 3a. ©Miyazaki K., et al. 2019 (b) Int J Mol Sci . 2018 Nov 16;19(11). Created by modifying Figure 8A. ©Akimoto N., et al.2018 (Licensed under CC BY 4.0) https://creativecommons.org/licenses/by/4.0/]

(a)Green : Lung cancer cells
Yellow: Fibroblasts

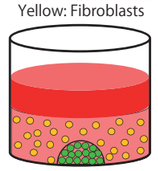
Schematic diagram of in-gel 3D culture of co-cultured spheroids



Arrow: GFP-expressing cancer cells adhering to fibroblasts

It has been observed that cancer cells bind to fibronectin on the surface of fibroblasts through integrin $\alpha 5 \beta 1$ and acquire migration ability. This indicates that collagen gel is useful for elucidating the interaction between cancer cells and stroma (Reference 1).

(b) Green: Adenoid cystic carcinoma cells
Yellow: Fibroblasts



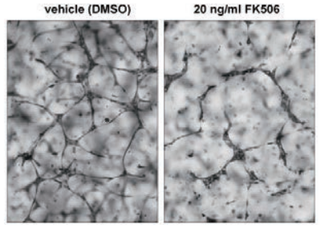
Schematic diagram of in-gel 3D culture of cancer cells in a stromal model

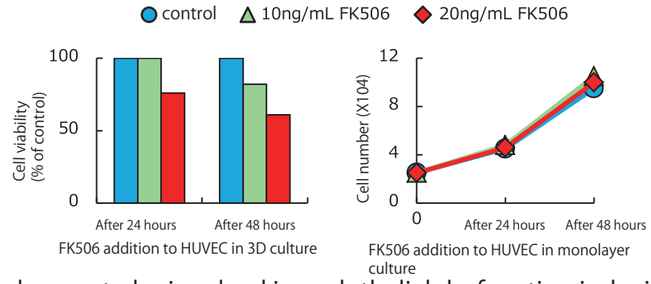
GFP-expressing cancer cells invading a stromal model

It was demonstrated that co-expression of BRACHYURY and SOX2 enhances EMT, stem cell markers, and self-renewal ability, which contributes to the development of cancer stem cells. On the other hand, collagen gel has been shown to be useful for creating stromal models and evaluating cancer cell invasion(Reference 2).

Example 2 Three-dimensional culture of blood vessel endothelium using the collagen gel

(Eguchi R, Hyogo College of Medicine Department of Environmental and Preventive Medicine)

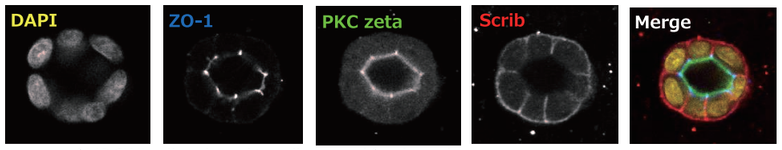




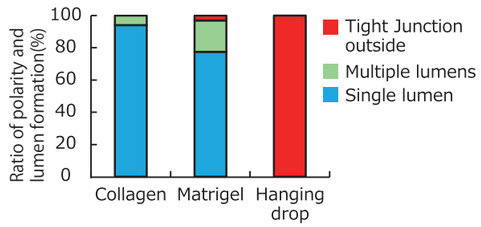
An immunosuppressant FK506 is known to be involved in endothelial dysfunction inducing thrombotic microangiopathy after hematopoietic stem cell transplantation.
In order to clarify the mechanism of the event, human umbilical vein endothelial cells (HUVEC) in collagen gel 3D culture were treated with FK506. In 3D culture, FK506 induced cell death and tube structure breakdown in a time- and concentration-dependent manner, but showed little effect on cells in monolayer culture. These results suggest 3D culture in collagen gel is useful to investigate in vivo phenomenon in vitro (Ref.3).

Example 3 Cell polarity formation of renal epithelial cells using collagen gel

(Yonemura S, RIKEN Center for Life Science Technologies Ultrastructural Research Team)



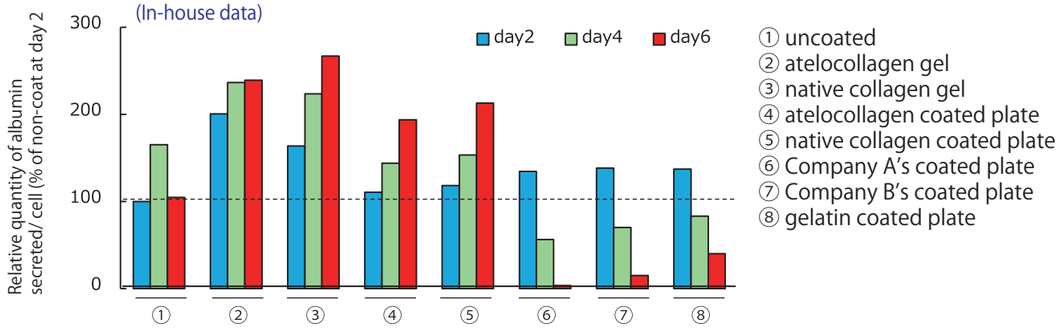
Images of MDCK II cells cultured in collagen gel for three days



Localization of ZO-1 (tight junction) and PKC Zeta (apical membrane) markers were observed inside spheroids of Madin-Darby canine kidney (MDCK) II cells cultured in collagen gel. On the other hand, localization of Scrib, a basal marker, was observed at the outer surface of spheroids. Thus, collagen gel 3D culture is effective for the formation of apical-basal polarity. Furthermore, collagen gel cultures showed a higher rate of single lumen formation compared to Matrigel and hanging drop culture (Ref. 4).

Example 4 Comparison of albumin production of rat primary hepatocyte by various culture methods

(In-house data)



Evaluation of albumin production in rat primary hepatocytes using eight culture methods showed that collagen gel culture maintained higher albumin production than other methods (②, ③). Coated plates gave results similar to gelatin-coated plates, suggesting possible collagen denaturation during storage prior to use (⑥, ⑦, ⑧).