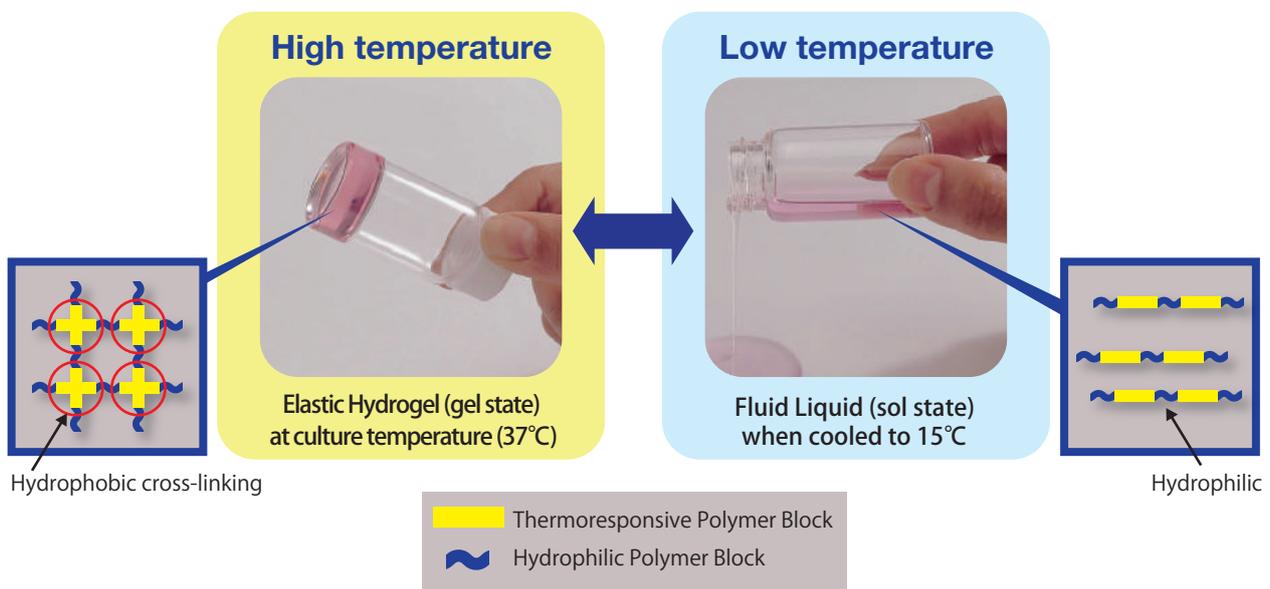


# Mebiol® Gel

For 3D Cell Culture  
And Other Applications

## Thermoreversible Hydrogel Thermoreversible Gelation Polymer (TGP)

Hydrogels are a diverse class of polymeric materials characterized by their network-like structure and high water content. Hydrogels of many kinds have found a wide variety of applications in medicine and life science research weighted towards, but not at all limited to three-dimensional cell culture, tissue engineering, and drug delivery. Properties highly favorable to cell culture and tissue engineering applications prompted the commercialization of Mebiol® Gel, a copolymer of poly (N-isopropylacrylamide) and poly (ethylene glycol) (PNIPAAm-PEG) for research purposes in the early 2000's.



Mebiol® Gel's defining feature, in contrast to other commercially available hydrogels, is its temperature reversible sol-gel transition. When cooled, Mebiol® Gel is a sol (handles like a liquid) but becomes a rigid hydrogel at higher temperatures. In practice, this means extremely easy cell handling. Cultures are seeded into cooled Mebiol® Gel and recovered conveniently by cooling the culture vessel and centrifugation. In the gel state, the highly lipophilic environment of the Mebiol® Gel presents an efficient niche for cell proliferation, cell communication, gas and mass exchange, and protection of cells and tissue from shear forces.

### Mebiol® Gel Features

- Easy handling
- Non-toxic, biocompatible
- 100% synthetic, pathogen free
- High transparency for cell observation
- Proven performance



Mebiol® Gel comes packaged as a dry powder in sterile culture flasks. Use Mebiol® Gel in the supplied flask or other culture vessels such as multi-well plates

### Mebiol® Gel published applications include :

- Stem cells and pluripotent stem cell culture, expansion, and differentiation
- Spheroid culture
- Cell implantation
- Organ and tissue regeneration
- Drug delivery
- Non-cell culture applications
- Physical Properties



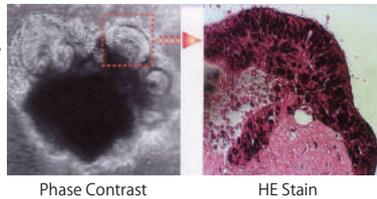
## Application examples

### 1. Culture of primary cancer cells in Mebiol® Gel

In collagen and other 3D gel cultures, proliferation of primary cancer cells may be inhibited by fibroblast overgrowth. Importantly, fibroblasts do not readily grow in Mebiol® Gel, allowing selective proliferation of primary cancer cells for further analysis and characterization.

**Figure 1**

Cancerous human colon tissue cultured in Mebiol® Gel for 10 days. (Courtesy of Dr. S. Kubota, Dept. of General Surgery, St. Marianna University School of Medicine)

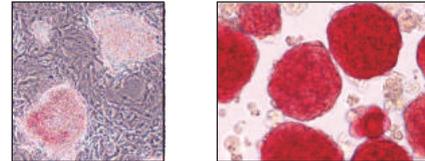


Phase Contrast

HE Stain

### 2. Stem Cell Culture

Macaca embryonic stem cells cultured on Mebiol® Gel without LIF (right panel) show morphology and alkaline phosphatase staining characteristic of undifferentiation compared to 2D feeder layer cultures (left panel).



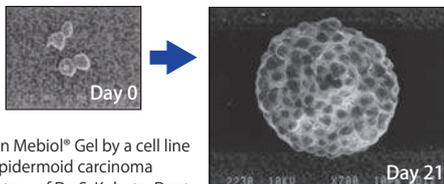
2D culture on Feeder cells

3D Culture in Mebiol® Gel (Day 7)

**Figure 2** Courtesy of Dr. K. Hishikawa, Dept of Clinical Renal Regeneration, University of Tokyo.

### 3. Spheroid Formation

Mebiol® Gel supports spheroid formation of cancer cell lines and iPS cells.

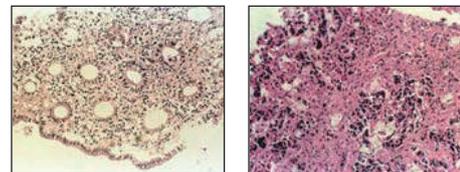


**Figure 3**

Spheroid formation in Mebiol® Gel by a cell line derived from mucoepidermoid carcinoma (cholangioma). (Courtesy of Dr. S. Kubota, Dept. of General Surgery, St. Marianna University School of Medicine)

### 4. Tissue Structure Preservation

Mebiol® Gel's protective environment helps to preserve tissue structure over long term culture.

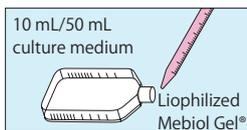


**Figure 4** Left panel: Normal colonic mucosal tissue after culture on Mebiol® Gel for 7 days.  
Right panel: Metastatic hepatic carcinoma tissue after culture in Mebiol® Gel for 21 days.

(Courtesy of Dr. S. Kubota, Dept. of General Surgery, St. Marianna University School of Medicine)

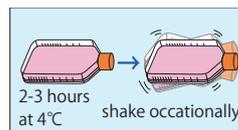
## Preparation

#### 1) Add culture medium



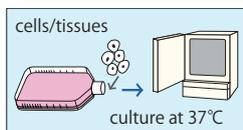
Open package in a clean bench and add 10 mL/50 mL culture medium to lyophilized Mebiol® Gel in a flask.

#### 2) Dissolve Mebiol® Gel



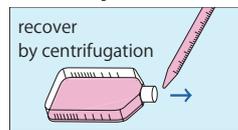
Lay the flask stationary at 4°C for about three hours. Then dissolve Mebiol® Gel in culture medium by shaking occasionally the flask gently with keeping it at low temperature.

#### 3) Cultivation of cells/tissues



Add cells/tissues into sol state Mebiol® Gel and then culture it at 37°C in CO<sub>2</sub> incubator.

#### 4) Recovery of cells/tissues



To recover cells/tissues after cultivation, liquefy Mebiol® Gel containing cultured cells/tissues at low temperature and dilute it with 30-40 mL/150-200 mL of cold saline or medium. This dilution prevents gelation so, suspended cells/tissues can be easily recovered by centrifugation.

Description	Cat. No.	Quantity	Storage
Mebiol® Gel	MBG-PMW20-1001	1x10 mL	Room temperature
	MBG-PMW20-1005	5x10 mL	
	MBG-PMW20-5001	1x50 mL	
	MBG-PMW20-5005	5x50 mL	

