

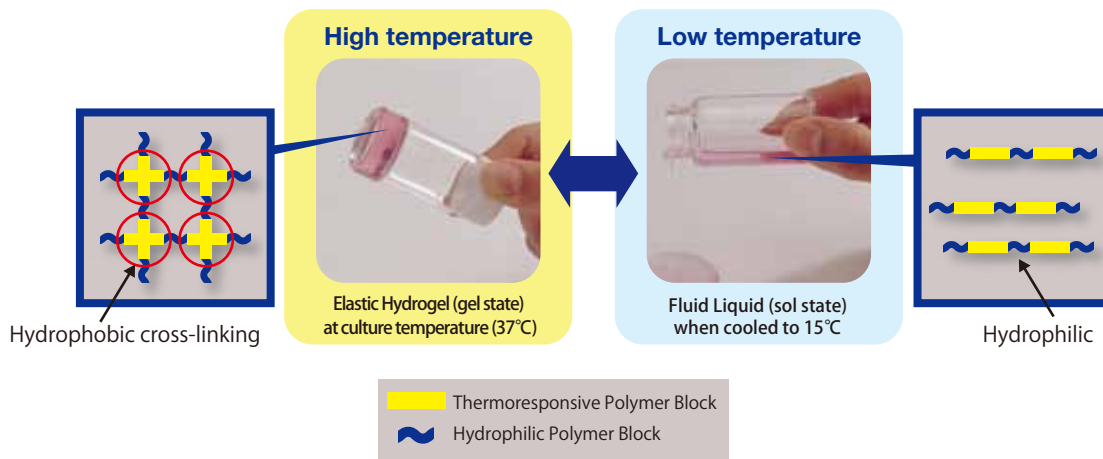
Mebiol® Gel

Thermoreversible Hydrogel

**For 3D Cell Culture
And Other Applications**

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 lipophylic 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



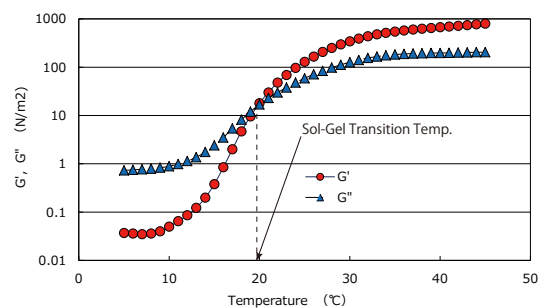
Mebiol® Gel is packaged as a dry powder in sterile culture flasks. Use Mebiol® Gel in the supplied flask or transfer to other vessels after rehydration.

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



Dynamic Viscoelastic Property of Mebiol® Gel



Temperature dependence of the dynamic moduli of the aqueous solution of Mebiol® Gel at a concentration of 10 wt% in distilled water. Storage modulus (G' , solid lines) and loss modulus (G'' , broken lines) were measured on heating (closed symbols) and cooling (open symbols) at the oscillatory frequency of 1 Hz.

Concentration: 10 wt% in Distilled Water
Oscillatory Frequency: 1 Hz



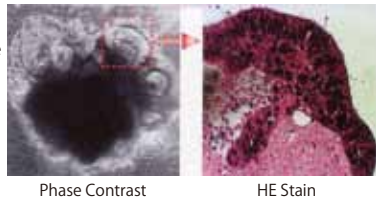
Application examples

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)



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).

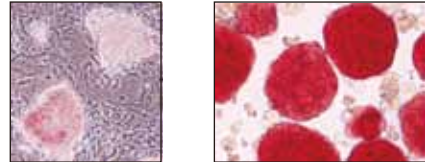


Figure 2 Courtesy of Dr. K. Hishikawa, Dept of Clinical Renal Regeneration, University of Tokyo.

3. Spheroid Formation

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

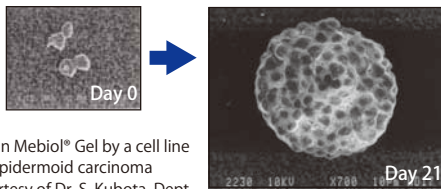


Figure 3

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.

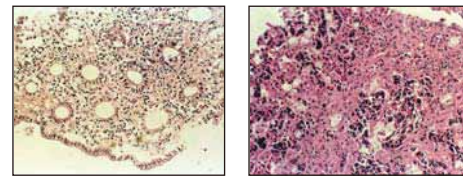


Figure 4 Left panel: Normal colonic mucosal tissue after culture on Mebiol® Gel for 7 days. Right panel: Metastatic hepatic carcinoma tissue after culture in Mebiol® Gel for 21 days. (Courtesy of Dr. S. Kubota, Dept. of General Surgery, St. Marianna University School of Medicine)

Preparation

Mebiol® Gel Usage (refer to package insert for details)

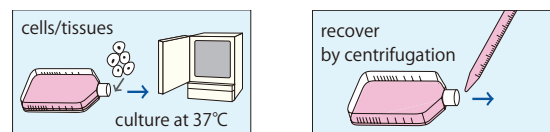
① Rehydration

Add 10 ml/50 ml of cold aqueous solution suitable to your application (e.g. culture medium, PBS). Insure all powder is wetted. Lay flask flat and stationary for several hours at 4°C, with occasional gentle shaking.



② Cell Culture and Recovery

Add cells or tissue to Mebiol Gel in the sol state (cold). Culture at 37°C. Recover cells or tissue by cooling culture vessel and diluting with 30-40 ml/150-200 ml cold fluid to prevent gelation. Centrifuge in cold.



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	

