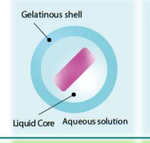
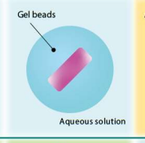
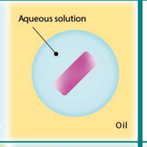
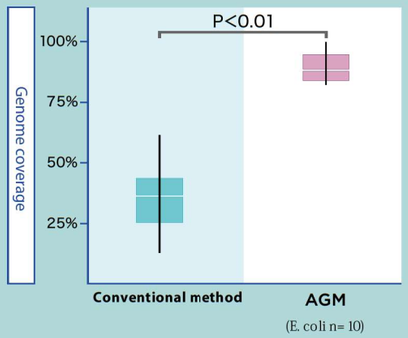
Example of the use of genome analysis in AGM encapsulation methods for microorganisms that can clearly assess AGM isolation characteristics

	AGM (our technology)	Gel beads	Water-in-Oil droplet	FACE & PCR plate
Form				
Buffer, reagent exchange	Easy	Easy	Difficult	
Diffusion in capsule	Easy	Difficult	Easy	
Unit of 1 capsule	Easy	Easy	Difficult	
Number of genome amplification reactions	1	2	2	1
Coverage (%)	93.0∓4 .7	58.6	70.4∓1 4.0	46.6
Documents	Aoki H, 2022	Bigdeli S, 2015	Hosokawa M, 2017	Alneberg J, 2018

Comparison of genome coverage in DNA amplification by MDA <E. coli> .**



Although technologies for miniaturizing the reaction volume to improve genome coverage, such as gel bead embedding (center figure) and emulsions (right figure/small droplets suspended in oil: Water-in-Oil), have been put to practical use, AGM can solve all these problems, including the restriction of spatial freedom due to the embedding of microbes in the gel, the inability to supply necessary components from outside, difficulty in isolating fragile emulsions, and the need for expensive and specialized equipment.

AGM™Product Specifications

Applicable cell	For animal cells	For microorganisms
Model	AGM-1000	MCM-3
Volume	3 times for each model (each time corresponds to 3 x 10^6 cells)	
Storage method	Refrigerated storage required	
Expiry date	Within 1 year	
Delivery	TBD	

Cell Encapsulation Reagents（AGM™）

Contact address:

E-mail : agm-sales@toyo.co.jp URL : www.toyo.co.jp/agm/

Please contact us for details.

TOYO Corporation
One Technologies Company
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www.toyo.co.jp/agm/

ONE TECH
ONE TECHNOLOGIES COMPANY

ISO 14001 JQA-EM4908 ISO 9001 JQA-QM8795

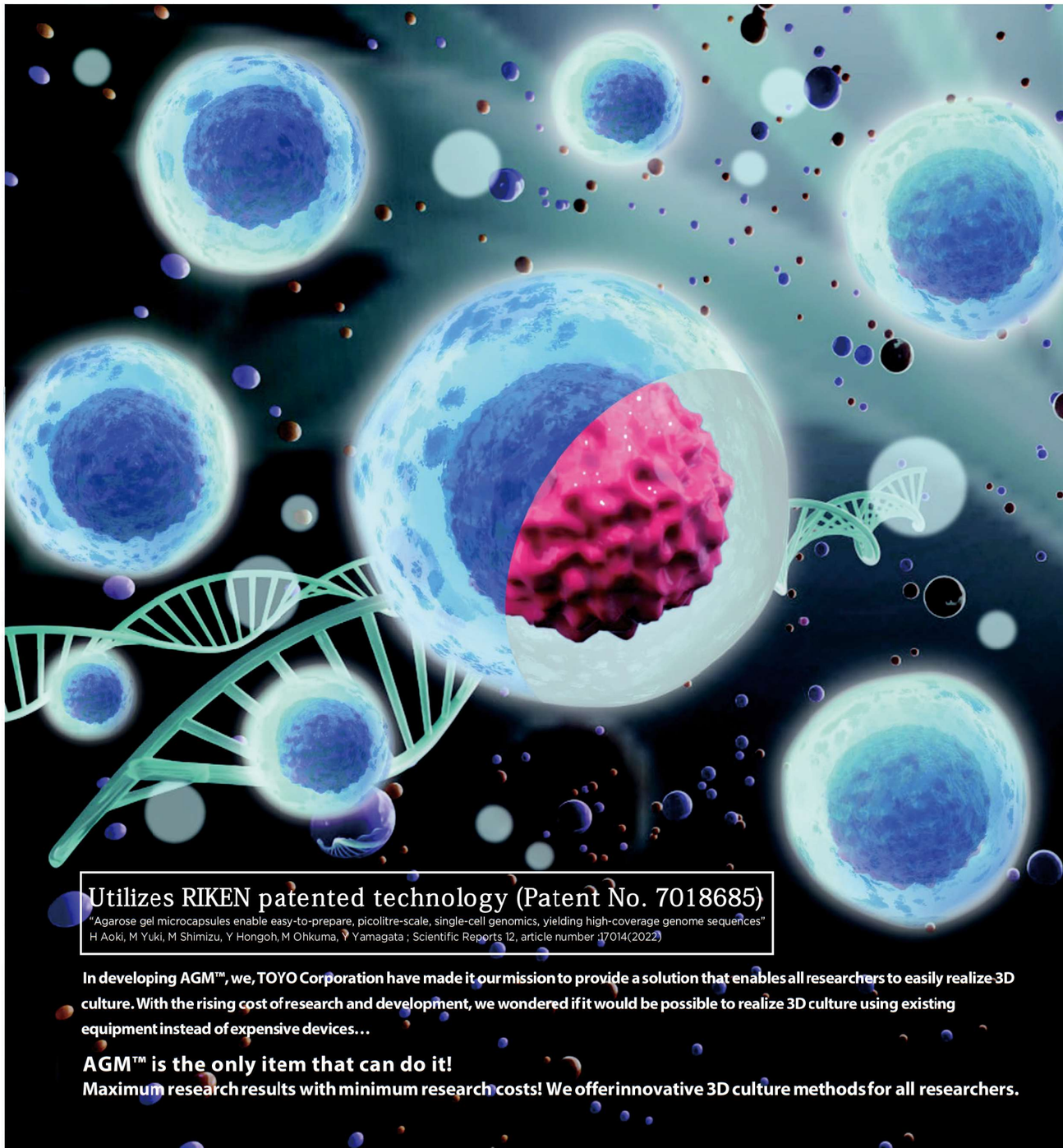
TOYO Corporation
Quest for Precision

AGM

3D culture for all researchers!

3D cell culture easily achieved in the 2D environment of a CO2 incubator

Cell Encapsulation Reagent (AGM™)



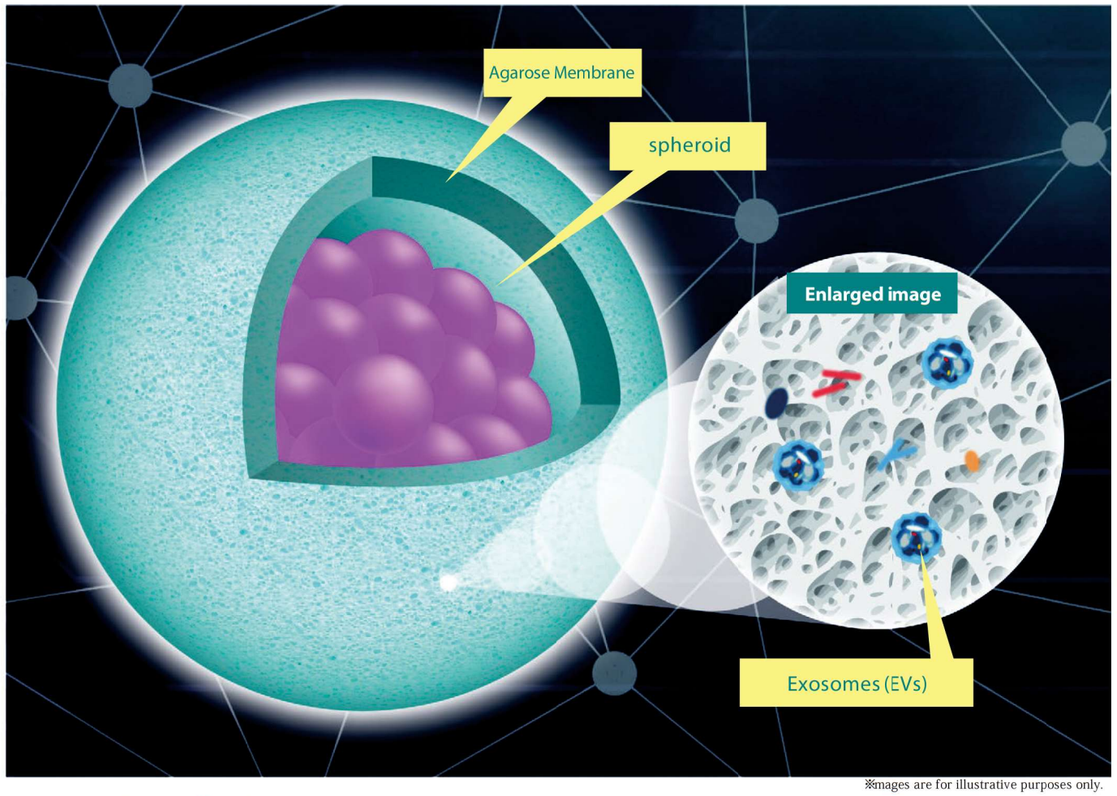
Utilizes RIKEN patented technology (Patent No. 7018685)
"Agarose gel microcapsules enable easy-to-prepare, picolitre-scale, single-cell genomics, yielding high-coverage genome sequences"
H Aoki, M Yuki, M Shimizu, Y Hongoh, M Ohkuma, Y Yamagata ; Scientific Reports 12, article number :17014(2022)

In developing AGM™, we, TOYO Corporation have made it our mission to provide a solution that enables all researchers to easily realize 3D culture. With the rising cost of research and development, we wondered if it would be possible to realize 3D culture using existing equipment instead of expensive devices…

AGM™ is the only item that can do it!
Maximum research results with minimum research costs! We offer innovative 3D culture methods for all researchers.

The latest solution for cell 3D encapsulation technology

The encapsulation technology of living cells can be used in many areas of research, including cell culture, cell transplantation, cell-based therapeutic delivery, and controlled drug delivery, because the living cells are encapsulated in a biocompatible protective capsule that maintains an optimal survival environment. Furthermore, the encapsulated membrane structure also functions as an inhibitory and protective mechanism against attacks by the autoimmune system, and is being investigated for effective use in xenotransplantation and other applications.



※mages are for illustrative purposes only.

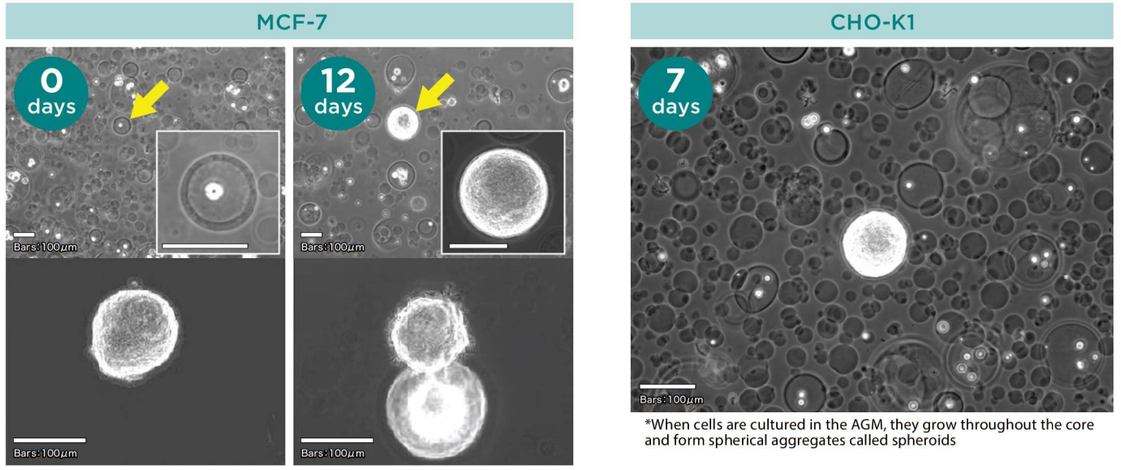
AGM™ Capsule Overview

The agarose capsule is a porous material of 30 to 200 nm in diameter that can quickly accommodate media exchange and gas exchange, including metabolites from cells. It also has an isolating function against foreign substances entering from outside the membrane, and provides excellent cell protection against shear damage during medium exchange, which is an issue in cell culture.

Features of AGM™

- Cellular degeneration, which is a problem in 2D culture environments, is suppressed.
- Cultured cells in AGM are maintained in a 3D environment similar to that in vivo.
- The multi-closure membrane of AGMs can be used for rapid medium and gas exchange.
- Spheroid and organoid formation can be realized in AGM.
- The protective effect of AGM prevents shear rupture during medium exchange.
- It can be utilized as a co-culture capsule.

Example of spheroid formation in AGM 3D culture



*When cells are cultured in the AGM, they grow throughout the core and form spherical aggregates called spheroids

The captured images show how MCF-7 and CHO-K1 cells were cultured in AGM. The porous structure of the capsule wall allows components and other materials to be fed into the capsule, and both cells were successfully cultured in the AGM.The results of culturing MCF-7 cells for 12 days (top) and the example of cells leaking from the capsule after that (bottom) are shown.The CHO-K1 cells were confirmed to be cultured without scaffold material on the 7th day.

AGM 3D Cell Culture Usage

For the acquisition and collection of extracellular metabolites such as exosomes
For separation and collection of extracellular endoplasmic reticulum, etc. utilizing AGM's porosity (φ200 nm)

For application research to Organ on Chip
Technical research utilizing spheroid/organoid and other

Utilization as a capsule for cell preservation and transport
Can be utilized for cell preservation after culture. Prevents shear breakdown by culture medium during transportation

For cell-based drug efficacy evaluation research
Allows rapid chemical exchange for cultured cells.
Enables high-throughput evaluation with cells

For food research
AGM is safe as a food additive. As capsules for Intestinal bacteria administration

As an immune-inhibitory membrane in xenotransplantation research
Isolation structure (agarose membrane) can suppress attacks from immune cells

Use a droplet generator for AGM particle size uniformity

Overview of cell AGM embedding technique in manual operation