FUJIFILM
Value from Innovation

Wako

Cell Culture Media for Vaccine Production

WakoVAC

FUJIFILM Wako Pure Chemical Corporation

What is WakoVAC media?

FFWK's[*1] Cell Culture Media Series for Vaccine Production

A series of media with very high performance in cell growth. We are especially aiming to support vaccine manufacturing with our quality products. We can provide samples from our prototypes and modify them to meet your requirements.

Product Line-up

WakoVAC PSFM-J1
for insect cells

WakoVAC MDCK
for MDCK cells

WakoVAC Vero
for Vero cells

- **Raw Materials**
  Documented supply chains/Animal component-free, non-animal hydrolysate contained[*2] /Fish-oil(cGMP, virus inactivated) and hydrolysate (non-animal) contained[*3]
- **Industrial Applications**
  For bioproduction, scalable to commercial volumes/Available in both liquid and powder form
- **Advantages**
  Best in class performance/Easy to use

Manufacturing at Aichi M-1 Factory

Factory for Culture Media：GMP-complaint (under ICH guideline (Q7))

- **Quality System**
  GMP（Validation: manufacturing, analytical procedure, cleaning)
- **Scalability**
  Development, test-batch to commercial manufacturing
- **Material Sourcing**
  Robust change-control

	Powder		Liquid
	GMP	Small scale / Test batch	GMP
Capacity	400～1,000kg/Batch	1～100kg/Batch	1～1,500L/Batch
Environment	Class 100,000↓, Pest control	Air-conditioning, Pest control	Class 100～100,000, Pest control
Humidity	40～60%	-	40～60%
Tempereture	22±3℃	-	22±3℃

In-house Culture media for vaccine manufacturing

Customization Commercial products at GMP

*1 FUJIFILM Wako Pure Chemical Corporation
*2 WakoVAC MDCK, Vero
*3 WakoVAC PSFM-J1
*GMP：GMP-compliant manufacturing under ICH guideline(Q7)
**Shelf-life : May vary by prototype

Product Line-up

WakoVAC PSFM-J1 for insect cells (Sf9, Sf21, Hi5)

In-licensed media. Formulated for insect cell expansion. Even being made with the same formulation, WakoVAC PSFM-J1 manufactured in FFWK outperforms the same media manufactured by a competitor due to quality and strictly-controlled raw materials.

Product Features

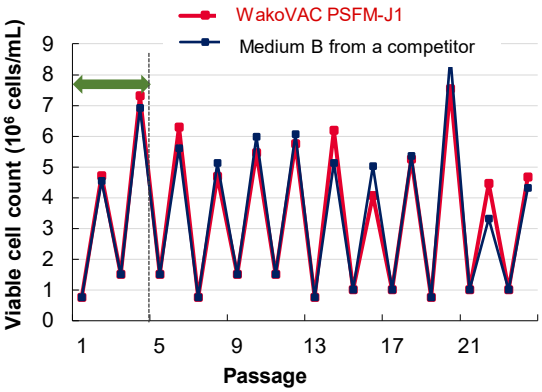
- Supports a wide range of insect cells : Hi5, Sf9, Sf21
- Fish-oil (cGMP) and yeast-derived hydrolysate contained
- Formulations built for large-scale manufacturing and industrial vaccine applications

	PN 160-25851	PN -
Form	Liquid	Powder
Packaging	1L	8kg
Shelf-life	1 year	2 years
Storage	2-10˚C, protect from light	

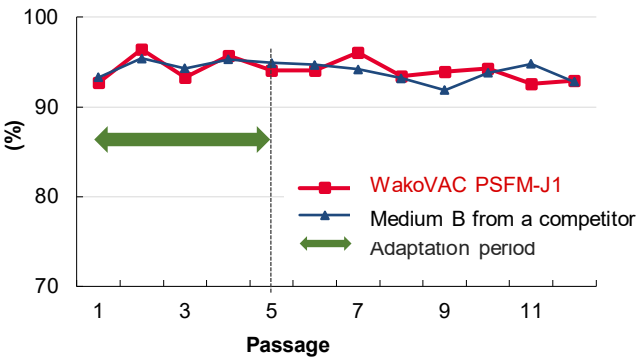
Retains robust cell growth, viability and target expression with Sf9

Similar results were also shown in the evaluation tests with Sf21 and H5.

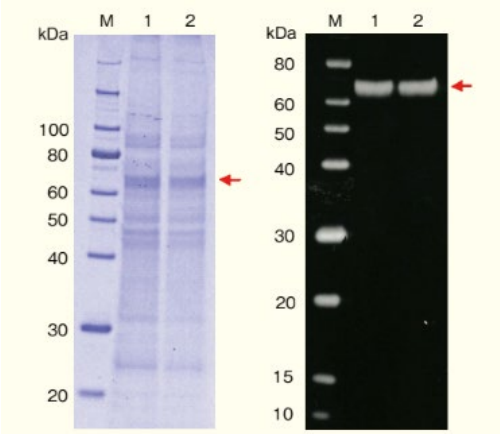
Cell Growth



Cell Viability



Protein Expression Testing



※Data provided by Goshima Lab from Nagoya University

- The volume of samples being used: 20 µL/Lane
- SDS-PAGE: SuperSepTM Ace 10-20 % (Product code: 191-15031), 200v constant voltage for 60 minutes
- Western blotting: PVDF membrane
- Antibody: Anti-his tag antibody

M :Molecular weight size marker
Lane 1: WakoVAC PSFM-J1
Lane 2: Medium B from a competitor
➔ : Target protein

WakoVAC MDCK for MDCK cells

We can modify the medium for your cells according to your requirements.

Product Features

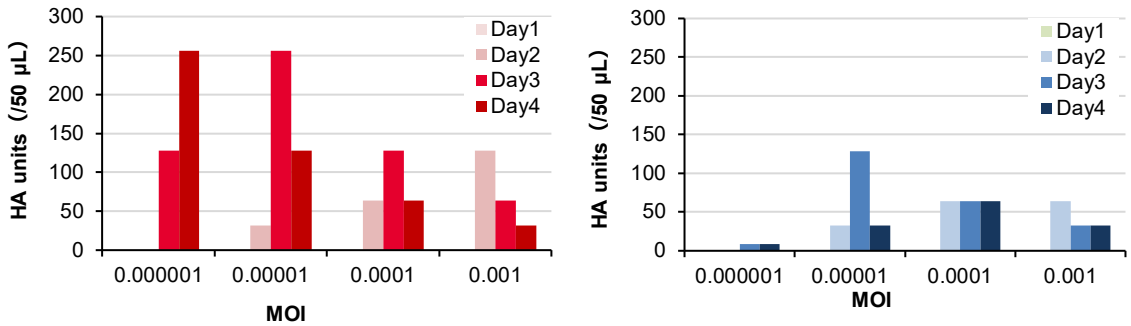
- Animal component free
  *Includes non-animal hydrolysate
- Custom-modifications are available
- Compatible with a range of scales of production from research to industry
- Adaptation not required
- Compatible with microcarriers

	Sample for evaluation		Customize
Form	Liquid	Powder	Upon request
Packaging	500ml	for 10L	
Shelf-life	TBD	12 months (ongoing)	
Storage	in freezer (-20˚C), protect from light	below 10˚C*, protect from light	-

*Attached supplement (vial); in freezer (-20˚C)

Equals to or higher yields of influenza virus than commercially available serum-free medium

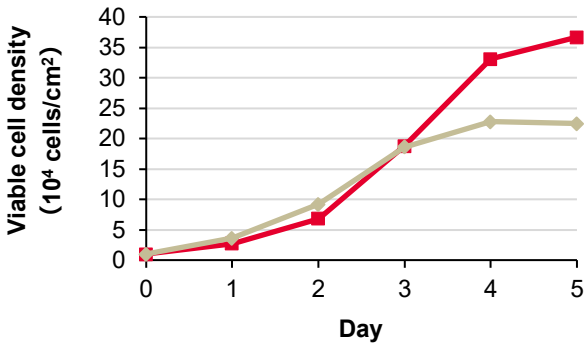
◆ **WakoVAC MDCK** serum-free medium, Prototype A ◆ Medium B, serum-free, Competitor's



Influenza A virus (H1N1)

- Static
- T-flask
- 37 ℃ , 5 % CO_2
- Number of viral inoculated cells
  WakoVAC : 25.8×10^4 cells/cm^2
  Medium B : 21.2×10^4cells/cm^2

Outperforms commercially available serum-containing medium

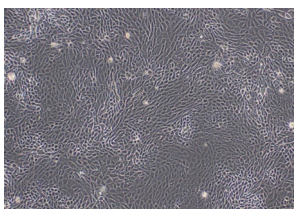


WakoVAC MDCK Serum-Free Medium, Prototype A

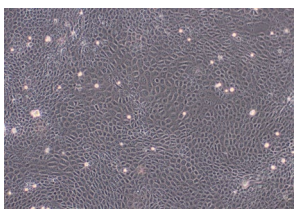
EMEM/NEAA/10%FBS

- Cumulated cell number over 4 passages was assessed
- Static
- T-flask
- Number of cells plated : 1×10^4 cells/cm^2
- 37℃, 5 % CO_2

WakoVAC MDCK Serum-free Medium, Prototype A (Day4)



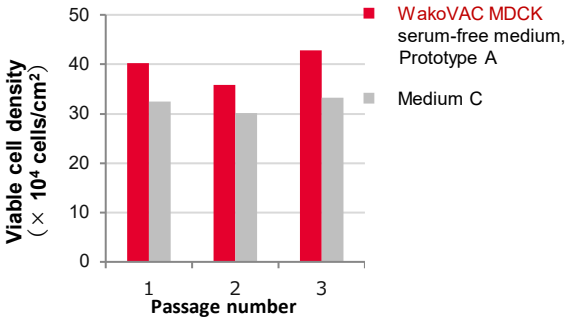
EMEM/NEAA/ 10%FBS (Day4)



Adaptation not necessarily required

Smooth adaptation in switching from serum-free medium or serum-based medium.

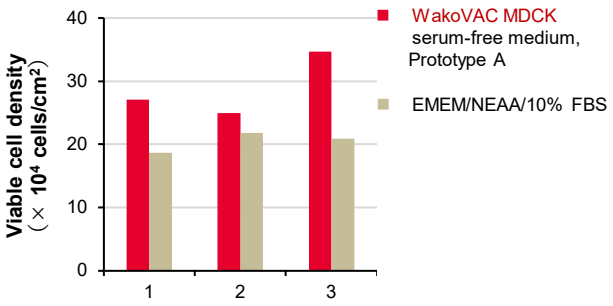
Switch from a commercially available serum-free medium



MDCK cell
- Serum-free medium
- Static
- T flask

- 37℃, 5% CO_2
- Number of cells plated: 1×10^4 cells/cm^2
- Culturing duration: 4 days

Switch from a serum-containing medium

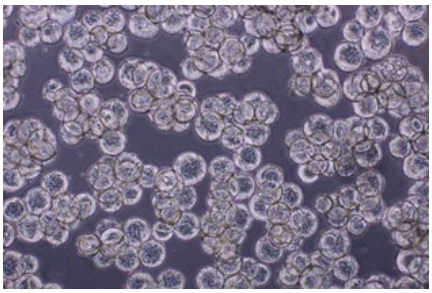


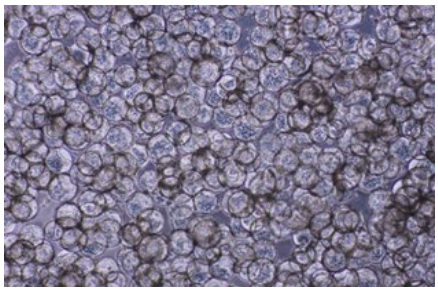
MDCK cell
- Serum-free medium
- Static
- T flask

- 37℃, 5% CO_2
- Number of cells plated: 1×10^4 cells/cm^2
- Culturing duration: 4 days

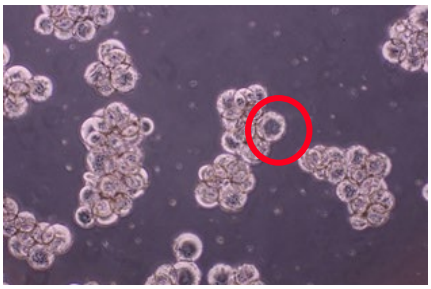
Compatible with microcarrier

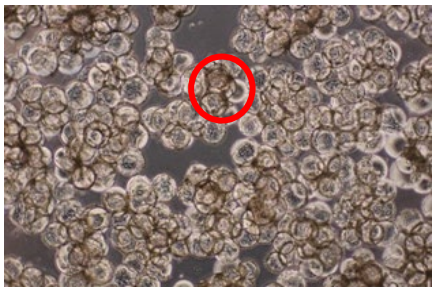
WakoVAC MDCK prevents cell detachment and cell aggregation on microcarriers during cell culture.





MDCK cell with WakoVAC MDCK Prototype A
- Microcarrier
- @day3 and day4
- Cell detachment↓
- Cell aggregation↓





MDCK cell with Medium D, Competitor's
- Microcarrier
- @day3 and day4
- Cell detachment↑
- Cell aggregation↑

WakoVAC Vero for Vero cells

We can modify the medium for your cells according to your requirements.

Product Features

- Animal component free
  *Includes non-animal hydrolysate
- Custom-modifications are available
- Compatible with a range of scales of production from research to industry
- Adaptation not required, in general
- Compatible with microcarriers

	Sample for evaluation		Customize
Form	Liquid	Powder	Upon request
Packaging	500ml	for 10L	
Shelf-life	TBD	TBD	
Storage	in freezer (-20˚C), protect from light	below 10˚C*, protect from light	-

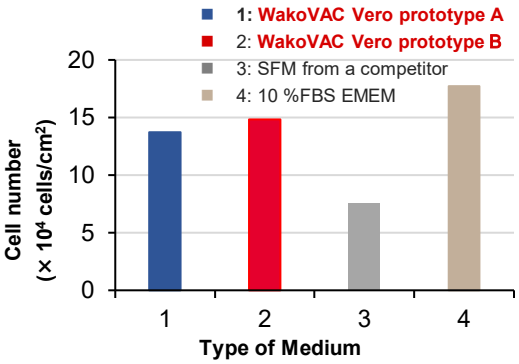
*Attached supplement (vial); in freezer (-20˚C)

Better cell growth than competitor' serum-free medium and serum containing medium under high cell-density culture

WakoVAC Vero showed cell growth similar to serum-containing medium and superior to the competitor's medium when we compared the performance of the media. The cell growth was compared in T-flask culture (left top), microcarrier culture with/without medium change (right top/left bottom). We also checked the effect of carrier density on the medium performance (right bottom).
(Prototype A; Chemically defined, Prototype B; Includes non-animal hydrolysate)

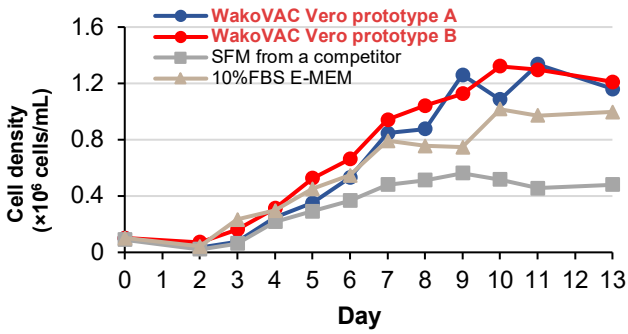
Cell growth

＜Static culture in T-flask＞



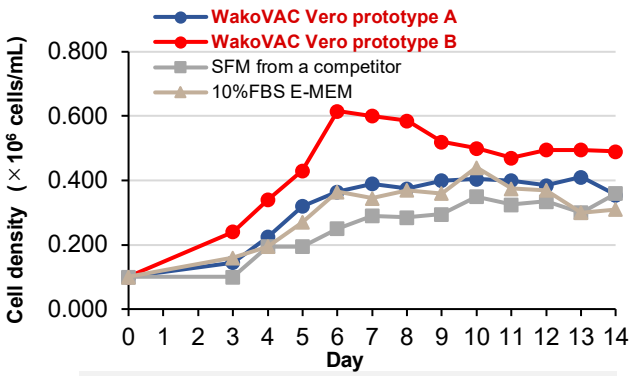
- T25 flask
- Cell type: Vero cell
- Number of seeded cells : 0.5x10⁶ cells
- Condition: 37℃, 5 % CO_2
- Culture period: 3 days
- Medium: 7.0 mL

＜Microcarrier culture with daily medium change＞



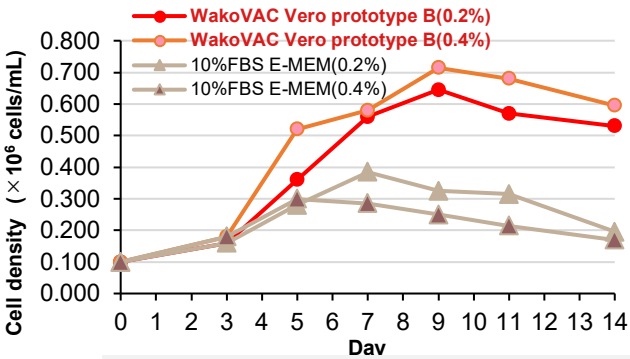
- 125mL Spinner Flask
- Cell type: Vero cell
- Microcarrier concentration : 0.2% (Cytodex1)
- Condition: 37℃, 5 % CO_2
- Frequency of 70 % medium change : Every day (from day2)
- Medium: 100 mL

＜Microcarrier culture without medium change＞



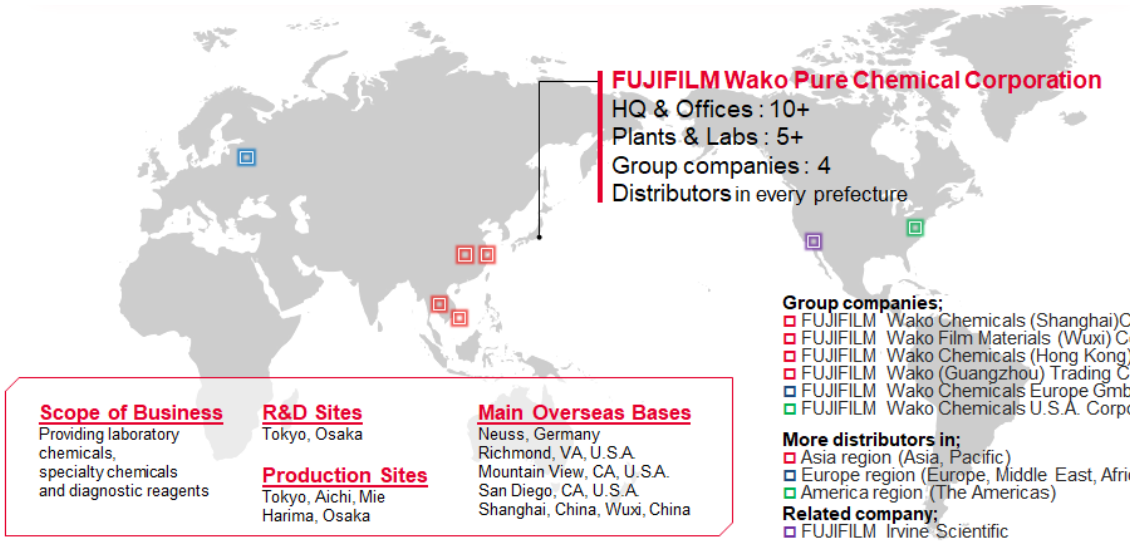
- 125mL Spinner Flask
- Cell type: Vero cell
- Microcarrier concentration : 0.2% (Cytodex1)
- Condition: 37℃, 5 % CO_2
- Medium: 100 mL

＜Effect of carrier density＞



- 125mL Spinner Flask
- Cell type: Vero cell
- Microcarrier concentration : 0.2-0.4% (Cytodex1)
- Condition: 37℃, 5 % CO_2
- Medium: 100 mL

Wako Related Sites



Aichi Plant For Cell Culture GMP Grade

Aichi plant is mainly for our own products for Bio Pharmaceutical and regenerative medicine products, and custom production. The plant have own two production Line for both powder and liquid culture media.

- **The medium production based on ICH pharmaceutical guideline (Q7)**
- **Validation from building /Utility to production, analysis, washing method**
- **High quality and origin confirmed raw material for powder media.**

Other

Media Optimization Service

This product is custom manufactured and supplied upon request. Please use the inquiry from below for sample requests quotes, and question. The person in charge will contact you for further information.

Service Flow

1. Inquiry → 2. Making test sample at FFWK → 3. Sample testing at your site →
4. Feedback of the test result → 5. Customization → 6. Fix formulation →
7. Place order → 8. Ship the media

Note:
-We respond to flexible small scale media demand with non-GMP samples formulated with the same quality raw materials used in GMP level. COS (testing includes appearance, pH and osmo) is available upon request.
-The shipping cost of the sample will be decided after consultation.
-A confidentiality agreement will be concluded upon request.