

# Alhydrogel® adjuvant 2%

Aluminum hydroxide gel

Catalog code: vac-alu-50; vac-alu-250

<https://www.invivogen.com/alhydrogel>

Distributed by InvivoGen for research use only

Version 22G26-NJ

## PRODUCT INFORMATION

### Contents

Alhydrogel® adjuvant 2% is provided in two pack sizes:

- 50 ml (5 x 10 ml): vac-alu-50
- 250 ml: vac-alu-250

It is provided as a ready-to-use, aluminum hydroxide wet gel (colloidal) suspension. Alhydrogel® adjuvant is sterilized by heating and aseptically filled.

### Storage and stability

- Alhydrogel® adjuvant 2% is shipped at room temperature and should be stored at room temperature. The expiry date is specified on the product label. **DO NOT FREEZE.** *Note: Do not expose to frost as product will be destroyed if ice crystals form in the gel.*

### Quality control

- vac-alu-250 is tested for pyrogenicity and sterility by Croda.
- vac-alu-50 is aseptically refilled and repacked by InvivoGen from Croda's original material

## CHEMICAL PROPERTIES

CAS Number: 21645-51-2

Formulation: Al(OH)<sub>3</sub>, Aluminum hydroxide gel

Appearance: White gelatinous precipitate

Aluminum content: 9.0 – 11.0 mg/ml

pH: ~6.5

## DESCRIPTION

Alhydrogel® adjuvant is an aluminum hydroxide (referred to as alum) wet gel suspension. Alum improves attraction and uptake of antigen by antigen presenting cells (APCs)<sup>1</sup>. Recently, it has been suggested that the antigens adsorbed on the aluminum salts are presented in a particulate form, more efficiently internalized by APCs. Moreover, alum activates the NLRP3 inflammasome complex implicated in the induction of several pro-inflammatory cytokines, including IL-1β and IL-18<sup>2</sup>. Alum increases Th2 antibodies but does not promote significant Th1 cellular response<sup>1</sup>. Alhydrogel® particles have a net positive electrical charge at pH 5-7 and thus are well suited for adsorption of negatively charged antigens (e.g. antigens with isoelectric points below the pH of formulation)<sup>3</sup>. Alhydrogel® adjuvant 2% is made by Croda, a leader in the global vaccine adjuvants market with a long history of producing high quality products. It was elected as the International Standard Preparation for aluminum hydroxide gels<sup>4, 5</sup>. It is present in multiple commercial vaccine formulations<sup>2, 6</sup>. Typical results obtained with Alhydrogel® adjuvant 2% are shown in figure 1.

1. Coffman R. *et al.*, 2010. Vaccine adjuvants: Putting innate immunity to work. *Immunity* 33(4):492. 2. Marrack P. *et al.*, 2009. Towards an understanding of adjuvant action of aluminium. *Nat Rev Immunol.* 9(4): 287. 3. Huang M. & Wang W., 2014. Factors affecting alum-protein interactions. *Int J Pharm.* 466(1-2):139. 4. Stewart-Tull D., 1989. Recommendations for the assessment of adjuvants (immunopotentiators). In: *Immunological adjuvants and vaccines* (Gregoriadis, G., Allison, A. & Poste, G., eds.), Plenum, New York, pp. 213. 5. Stewart-Tull D., 1991. The assessment and use of adjuvants. In: *Vaccines* (Gregoriadis, G., Allison, A., & Poste, G., eds.), Plenum, New York, pp.85. 6. Lindblad E. & Schönberg N., 2010. Aluminum adjuvants: preparation, application, dosage, and formulation with antigen. *Methods Mol Biol.* 626:41..

## TECHNICAL SUPPORT

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## METHODS

### Preparation of antigen-Alhydrogel® adjuvant 2% mixture

Antigens are preferentially diluted in saline or phosphate buffers. The amount of protein or conjugated peptide used for the primary immunization can be adjusted depending upon availability and immunogenicity of the antigen. For example, mice can be injected subcutaneously (s.c.) with 1 to 10 µg of endotoxin-free ovalbumin (cat. code: vac-pova). The adsorption capacity for a model protein such as diphtheroid toxoid, human growth hormone or ovalbumin in Alhydrogel® adjuvant varies from 1 to 3 mg (mg/mg Al)<sup>3</sup>.

1. **Before use, shake well** the capped bottle of Alhydrogel® adjuvant 2%.
2. Add Alhydrogel® adjuvant 2% to the antigen solution; the final volume ratio of Alhydrogel® adjuvant 2% to antigen should be 1:1 (100 µl Alhydrogel® adjuvant 2% for 100 µl of antigen) to 1:9 (100 µl Alhydrogel® adjuvant 2% for 900 µl of antigen).
3. Mix well by pipetting up and down for at least 5 minutes to allow Alhydrogel® adjuvant 2% to effectively adsorb the antigen.

The volume of injection depends on the site of administration. For example, 100 µl can be injected s.c. in mice.

*Note: To avoid anaphylaxis, do not use adjuvants for intravenous injection.*

Recommended maximum volumes for injection of antigen/adjuvant mixtures per site of injection for laboratory animals.

Species	Max. volume	Injection Site
Mice, hamsters	100 µl	subcutaneous (s.c.)
Mice, hamsters	50 µl	intramuscular (i.m.)
Guinea pigs	200 µl	s.c. or i.m.
Rats	200 µl	s.c. or i.m.
Rabbits	250 µl	s.c. or i.m.

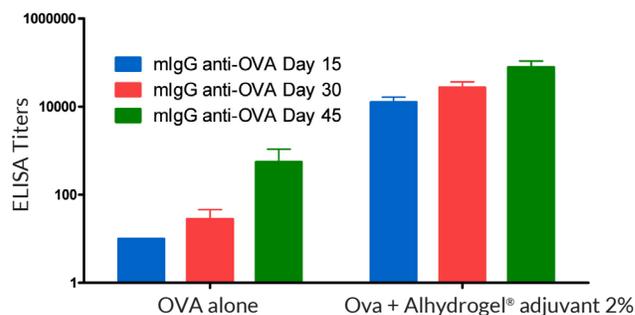


Figure 1. Anti-Ova mIgG levels at 15, 30 and 45 days after the initial immunization in different groups. Mice were immunized s.c. at 0, 2 and 3 weeks with 1 µg of EndoFit™ Ovalbumin alone or 1 µg of EndoFit™ Ovalbumin/Alhydrogel® adjuvant 2% (1:1, v/v) in a final volume of 100 µl. Serum anti-OVA mIgG was monitored by ELISA (coated with ovalbumin at 10 µg/ml in PBS).

Alhydrogel® is a trademark of Croda. It is supplied by InvivoGen for research and preclinical use only.

## RELATED PRODUCTS

Product	Description	Catalog Code
<b>Alum and emulsions</b>		
AddaS03™	AS03-squalene-based adjuvant	vac-as03-10
AddaVax™	Squalene-Oil-in-water	vac-adx-10
Adju-Phos® adjuvant	Aluminium phosphate gel	vac-phos-250
CFA	Complete Freund's adjuvant	vac-cfa-10
IFA	Incomplete Freund's adjuvant	vac-ifa-10
Quil-A® adjuvant	Saponin adjuvant	vac-quil
<b>PRR ligands</b>		
2'3'-cGAMP VacciGrade™	STING agonist	vac-nacga23
c-di-AMP VacciGrade™	STING agonist	vac-nacda
CL429 VacciGrade™	TLR2 & NOD2 agonist	vac-c429
Flagellin FliC VacciGrade™	TLR5 agonist	vac-fla
Imiquimod VacciGrade™	TLR7 agonist	vac-imq
MPLA-SM VacciGrade™ (MPLA from <i>S.minnesota</i> )	TLR4 agonist	vac-mpla
ODN 1826 VacciGrade™	Murine TLR9 agonist	vac-1826-1
Pam <sub>3</sub> CSK <sub>4</sub> VacciGrade™	TLR2 agonist	vac-pms
Poly(I:C) VacciGrade™	TLR3 agonist	vac-pic
R848 VacciGrade™	TLR7/8 agonist	vac-r848
TDB VacciGrade™	Mincle agonist	vac-tdb
<b>OVA antigens</b>		
EndoFit™ Ovalbumin	For <i>in vivo</i> use; endotoxin level < 1EU/mg	vac-pova
Ovalbumin	For detection; Western, ELISA	vac-stova
Ova 257-264	For detection; ELISPOT	vac-sin
Ova 323-339	For detection; ELISPOT	vac-isq

For a complete list of vaccine adjuvants provided by InvivoGen, please visit <https://www.invivogen.com/vaccine-adjuvants>.

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