QS-21 VacciGrade™

Vaccine adjuvant formulation of STIMULON® QS-21 from plant cell culture

Catalog Code: vac-qs21-1, vac-qs21-5, vac-qs21-25

https://www.invivogen.com/qs21-stimulon-adjuvant-vaccigrade

For research use only. Not for use in humans.

Version 24G26-NJ

PRODUCT INFORMATION

Contents

QS-21 VacciGrade™ is provided as a lyophilized powder without excipients and is alvailable in three quantities:

- 1 mg: vac-qs21-1
- 5 mg: vac-qs21-5
- 25 mg (5 x 5 mg): vac-qs21-25

Storage and stability

- QS-21 VacciGrade™ is shipped at room temperature. Upon receipt, store product at -20°C.
- QS-21 VacciGrade™ is stable for at least 1 year when properly stored.
- Upon resuspension, prepare aliquots of QS-21 VacciGrade™ and store at -20°C. The resuspended product is stable for 1 month when properly stored. Avoid repeated freeze-thaw cycles.

Quality control

- QS-21 VacciGrade™ is prepared under strict aseptic conditions and is tested for the presence of endotoxins.
- QS-21 VacciGrade™ is guaranteed sterile and its endotoxin level is <10 EU/mg (measurement by kinetic chromogenic LAL assay).
- Purity (≥ 96%) and structure have been determined by LC/MS.

PRODUCT DESCRIPTION

QS-21 VacciGrade™ is a pre-clinical grade preparation of the QS-21 saponin obtained from cultured plant cells. This source offers a uniform quality and a sustainable alternative to conventional QS-21 extracted from the South American *Quillaja Saponaria* tree bark[1]. Importantly, cultured plant cell QS-21 (cpcQS-21) and tree bark QS-21 (beQS-21) feature conserved biochemical, biological, and immune modulatory properties[1]. QS-21 VacciGrade™ is prepared under strict aseptic conditions.

Please note: QS-21 VacciGrade™ is a formulation of SaponiQx's proprietary saponin STIMULON® cpcQS-21.

STIMULON® is a registered trademark of Agenus Inc., the parent company of SaponiQx Inc.

CHEMICAL PROPERTIES

QS-21 is a mixture of two major isomers[1,2].

CAS numbers:

- QS-21 V1 isomer (QS-21-apiose; β–D-Apiofuranose): 141256-04-4
- QS-21 V2 isomer (QS-21-xylose; β–D-Xylopyranose): 250643-56-2

Formula: $C_{92}H_{148}O_{46}$

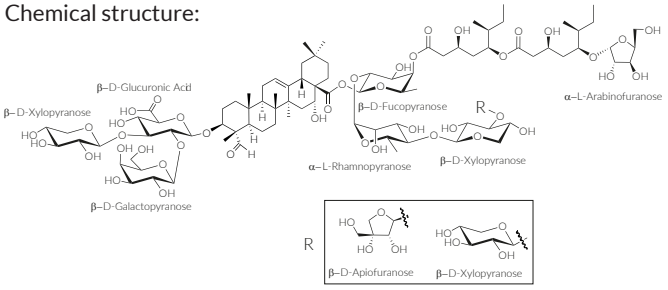
Molecular weight: 1990.15 g/mol

Solubility: 1 mg/ml in phosphate buffer saline (PBS, pH 6.8) or H_2O.

Note: If the product is resuspended in H_2O, we recommend to sonicate and heat at 37°C for 5 to 10 min. Do not exceed 10 min incubation at 37°C as it may result in partial QS-21 hydrolysis (in-house data and [3,4]).

Note: For stability and solubility purpose, we recommend to resuspend the product in PBS pH 6.8.

Chemical structure:



BACKGROUND

QS-21 is a potent vaccine adjuvant and a key component of human vaccines. Notably, QS-21 is used in adjuvant systems such as AS01®[1], a liposomal mixture of QS-21 and a TLR4 agonist, 3-O-desacyl-4'-monophosphoryl lipid A (MPL). MPL is a detoxified derivative of lipopolysaccharide from *Salmonella minnesota*. QS-21-based vaccines induce humoral and Th1-type cellular immune responses[2,5]. QS-21 facilitates antigen uptake and presentation by dendritic cells, and triggers the NLRP3 inflammasome-dependent release of IL-1β and IL-18[5].

1. Lv X. *et al.*, 2024. Chemical and biological characterization of vaccine adjuvant QS-21 produced via plant cell culture. iScience 27, 109006. **2. Kensil, C.R., 1996.** Saponins as vaccine adjuvants. Crit. Rev. Ther. Drug Carrier Syst. 13:1–55. **3. Cleland J.L., *et al.*, 1996.** Isomerization and formulation stability of the vaccine adjuvant QS-21. J Pharm Sci 85(1):22-28. **4. Fortpied J., *et al.*, 2020.** The thermostability of the RTS,S/AS01 malaria vaccine can be increased by co-lyophilizing RTS,S and AS01 Malar J 19(1):202. **5. Lacaille-Dubois, M.A., 2019.** Updated insights into the mechanism of action and clinical profile of the immunoadjuvant QS-21: A review. Phytomedicine. 60:152905.

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METHODS

QS-21 VacciGrade is formulated for adjuvantation experiments *in vivo*, but it is also suitable for *in vitro* experiments.
The resuspension solvent and method depends on your application. Please, refer to the literature. Examples can be found in:

- **Lv X. *et al.*, 2024.** Chemical and biological characterization of vaccine adjuvant QS-21 produced via plant cell culture. iScience 27, 109006.
- **Marty-Roix, R., *et al.*, 2016.** Identification of QS-21 as an Inflammasome-activating Molecular Component of Saponin Adjuvants. J Biol Chem 291:1123.

RELATED PRODUCTS

Product	Cat. Code
Vaccine Adjuvants	
MPLAs VacciGrade™	vac-mpls
MPLA-SM VacciGrade™	vac-mpla
AddaVax™	vac-adx-10
Adju-Phos® adjuvant	vac-phos-250
Alhydrogel® adjuvant 2%	vac-alu-250
CFA	vac-cfa-10
IFA	vac-ifa-10
ODN 1826 VacciGrade™	vac-1826-1
ODN 2006 VacciGrade™	vac-2006-1
TL7-887 VacciGrade™	vac-tl7887
TL7-975 VacciGrade™	vac-tl7975
OVA Antigens	
EndoFit™ OVA (endotoxin-free)	vac-pova
OVA protein	vac-stova

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