

PRODUCT DATA SHEET

Page 1 / 4

Lipodisq™ Control Sterile Solution

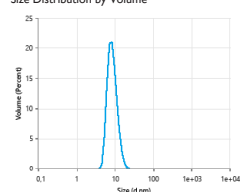
Nano-formulated aqueous solution: Ready-to-use

Cat. No.: IAX-700-100

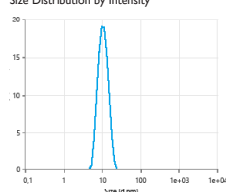
Lot. No.:

Synonyms	Detergent-free nano-formulation made of styrenemaleic acid lipid particles (SMA-Lipid Particles)
Concentration	N/A
Size	1 ml
MW	N/A
CAS	N/A
Purity	N/A
Solution pH	7.00 - 7.50
Solubility	Soluble in water, PBS, Tris and other physiological solutions as formulated in a proprietary, thermostable, aqueous lipid nanoparticulate formulation (Lipodisq™, Malvern Cosmeceutics Ltd., Malvern UK). Avoid the use of buffers with divalent ions such as Ca ⁺⁺ or Mg ⁺⁺ (>2mM) or pH <6.5 or >8.0, which can cause particle instability.
Formulation	Lipodisq™ are nanosized lipid-based discoidal particles that can be manufactured to incorporate hydrophobic, poorly water-soluble compounds, such as lipids, lipoproteins and glycolipids.
Appearance	Colourless clear aqueous solution
Handling	Keep sterile. Avoid skin and eye contact.
Activity	Cell culture tested (human macrophage cell line) (MTT). Recommended starting dilution: 1:200 or higher. Optimal working concentrations depend on the applications and need to be determined. Published procedures using Lipodisq™ formulations (Curcumin and IAXO TLR4 antagonists) <i>in vivo</i> rodent models at 3-10mg/kg. Recommended route of administration is subcutaneous (s.c.) with oral or nasal application as a possible alternative, which needs to be optimised.
Shipping	Ambient
Storage	2-8°C
Stability	In its unopened original vial, the product is stable for at least 12 months. Once the glass vial is opened, or if aliquoted into sterile vials under sterile conditions, the product remains stable for an additional 2 months at 2-8°C. Pre-diluted, sterile aqueous solutions are stable for at least 24 hours when stored at 2-8°C.
MSDS	Available on request

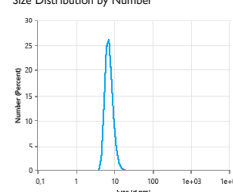
Size Distribution by Volume



Size Distribution by Intensity



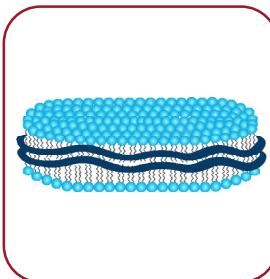
Size Distribution by Number



Document No.: IAX-700-100 | **Version:** 1.2 | **Issue Date:** 18/10/2024

DISCLAIMER: THIS PRODUCT IS NOT INTENDED OR APPROVED FOR HUMAN, DIAGNOSTICS, OR VETERINARY USE. THIS PRODUCT IS FOR RESEARCH USE ONLY (RUO).

MATERIAL SAFETY DATA: This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, inhale or allow to enter the bloodstream. Avoid contact with the eyes, or the skin, or clothing. Wash thoroughly after handling. Access to this material must be restricted to personnel, who are appropriately experienced, qualified, competent, and properly trained to use it.



PRODUCT DATA SHEET

Page 2 / 4

Lipodisq™ Control Sterile Solution

Nano-formulated aqueous solution: Ready-to-use

Cat. No.: IAX-700-100

Lot. No.:

Lipodisq™ Technology

- A nanoparticle (11-40nm) drug delivery system comprising a discoidal phospholipid bilayer membrane stabilised by a chaperone molecule annulus.
- Internal properties of the phospholipid membrane support the disposition and stabilisation of drug molecule candidates and preserve the native conformation of membrane molecules.
- The resulting encapsulated actives are rendered water-soluble and specialised for intra-cellular penetration/delivery via endosomal uptake mechanisms.
- Lipodisq™ solutions show a good safety profile and are suitable for *in vitro* and *in vivo* investigations.
- For a customizable biodegradable Lipodisq™ version with a higher concentration of actives or an alternative lipid option, contact Innaxon.

Component	Concentration	CAS #	EC #
Water (sterile)	QS	7732-18-5	231-791-2
Poly(styrene maleic acid)	25mg/ml	26762-29-8	607-996-1
Lecithin	10mg/ml	92128-87-5	295-786-7

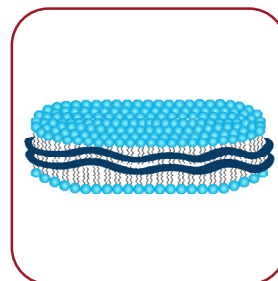
Lipodisq™ References

- [1] *Mechanisms of Formation, Structure, and Dynamics of Lipoprotein Discs Stabilized by Amphiphilic Copolymers: A Comprehensive Review.* Orekhov PS, et al. *Nanomaterials* (2022); 12:361
- [2] *Applications of Synthetic Polymer Discoidal Lipid Nanoparticles to Biomedical Research.* Tanaka M. *Chem. Pharm. Bull.* (2022); 70:507
- [3] *Understanding the Structural Pathways for Lipid Nanodisc Formation: How Styrene Maleic Acid Copolymers Induce Membrane Fracture and Disc Formation.* Bjørnstad VA, et al. *Langmuir* (2021); 37:6178
- [4] *Physicochemical Characterization, Toxicity and In Vivo Biodistribution Studies of a Discoidal, Lipid-Based Drug Delivery Vehicle: Lipodisq Nanoparticles Containing Doxorubicin.* Torgersen ML, et al. *J. Biomed. Nanotechnol.* (2020); 16:41
- [5] *Effects of charged lipids on the physicochemical and biological properties of lipid-styrene maleic acid copolymer discoidal particles.* Tanaka M, et al. *Biochim. Biophys. Acta. Biomembr.* (2020); 1862:183209
- [6] *From polymer chemistry to structural biology: The development of SMA and related amphipathic polymers for membrane protein extraction and solubilization.* Bada Juarez JF, et al. *Chem. Phys. Lipids.* (2019); 221:167
- [7] *The styrene-maleic acid copolymer: a versatile tool in membrane research.* Dörr JM, et al. *Eur. Biophys. J.* (2016); 45:3
- [8] *Reconstitution of membrane proteins: a GPCR as an example.* Goddard AD, et al. *Methods Enzymol.* (2015); 556:405

Document No.: IAX-700-100 | **Version:** 1.2 | **Issue Date:** 18/10/2024

DISCLAIMER: THIS PRODUCT IS NOT INTENDED OR APPROVED FOR HUMAN, DIAGNOSTICS, OR VETERINARY USE. THIS PRODUCT IS FOR RESEARCH USE ONLY (RUO).

MATERIAL SAFETY DATA: This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, inhale or allow to enter the bloodstream. Avoid contact with the eyes, or the skin, or clothing. Wash thoroughly after handling. Access to this material must be restricted to personnel, who are appropriately experienced, qualified, competent, and properly trained to use it.



PRODUCT DATA SHEET

Page 3 / 4

Lipodisq™ Control Sterile Solution

Nano-formulated aqueous solution: Ready-to-use

Cat. No.: IAX-700-100

Lot. No.:

Lipodisq™ References

- [9] Nano-size uni-lamellar lipodisq improved in situ auto-phosphorylation analysis of *E. coli* tyrosine kinase using ¹⁹F nuclear magnetic resonance. Li D, et al. *Protein Cell* (2015); 6:229
- [10] Characterizing the structure of lipodisq nanoparticles for membrane protein spectroscopic studies. Zhang R, et al. *Biochim. Biophys. Acta.* (2015); 1848:329
- [11] Advances in the use of nanoscale bilayers to study membrane protein structure and function. Malhotra K and Alder NN. *Biotechnol. Genet. Eng. Rev.* (2014); 30:79
- [12] DEER EPR measurements for membrane protein structures via bifunctional spin labels and lipodisq nanoparticles. Sahu ID, et al. *Biochemistry* (2013); 52:6627
- [13] Detergent-free formation and physicochemical characterization of nanosized lipidpolymer complexes: lipodisq. Orwick MC, et al. *Angew. Chem.* (2012); 51:4653
- [14] Detergent-free incorporation of a seven-transmembrane receptor protein into nanosized bilayer lipodisq particles for functional and biophysical studies. Orwick-Rydmark M, et al. *Nano Lett.* (2012); 12:4687
- [15] In vitro and in vivo evaluation of tumor targeting styrene-maleic acid copolymer-pirarubicin micelles: survival improvement and inhibition of liver metastases. Daruwalla, J, et al. *Cancer Sci.* (2010); 101:1866
- [16] Poly(styrene-alt-maleic anhydride) derivatives as potent anti-HIV microbicide candidates. Fang W, et al. *Bioorg. Med. Chem. Lett.* (2009); 19:1903
- [17] SMA-doxorubicin, a new polymeric micellar drug for effective targeting to solid tumours. Greish K, et al. *J. Control. Release* (2004); 97:219
- [18] Responsive Hydrophobically Associating Polymers: A Review of Structure and Properties. Tonge, SR and Tighe, BJ. *Adv. Drug Deliv. Rev.* (2001); 53:109

Lipodisq™ technology is covered by one or more of the following patents owned by Malvern Cosmeceutics Limited: AU2006253886, CA2611144, CN101184473B, EP1890675, GB2426703, IN261468, JP5142898, US8623414 and WO/2021/005340A1 pending.

The purchaser is licensed under those patents to use these assemblies for the purpose of research and development only but not for the purpose of delivery of agents for clinical use to humans or veterinary use to animals for therapeutic, diagnostic or prophylactic purposes, which uses are specifically prohibited.

Authorized Uses & Restrictions

The purchase of Innaxon product(s) conveys to the buyer the non-transferable right to use the purchased amount of the product and all replicates and derivatives for, internal, non-profit research purposes. The buyer cannot sell, resale or otherwise transfer (a) the product (b) its components or (c) materials made using this product or its components to a third party. The buyer agrees that any activity undertaken with the product and replicates or derivatives will be conducted in compliance with all applicable guidelines, laws, and regulations. The buyer agrees that the product and replicates or derivatives will not be used for any animal or human therapeutic or diagnostic use.

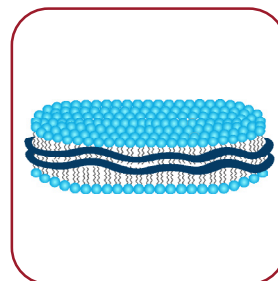
Limited Use License

Purchase does not include any other right or license to use, develop or otherwise exploit our products. Any use of Innaxon products outside of the Authorized Uses requires additional rights from the Licensor.

Document No.: IAX-700-100 | **Version:** 1.2 | **Issue Date:** 18/10/2024

DISCLAIMER: THIS PRODUCT IS NOT INTENDED OR APPROVED FOR HUMAN, DIAGNOSTICS, OR VETERINARY USE. THIS PRODUCT IS FOR RESEARCH USE ONLY (RUO).

MATERIAL SAFETY DATA: This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, inhale or allow to enter the bloodstream. Avoid contact with the eyes, or the skin, or clothing. Wash thoroughly after handling. Access to this material must be restricted to personnel, who are appropriately experienced, qualified, competent, and properly trained to use it.



PRODUCT DATA SHEET

Page 4 / 4

Lipodisq™ Control Sterile Solution

Nano-formulated aqueous solution: Ready-to-use

Cat. No.: IAX-700-100

Lot. No.:

Related Powered by Lipodisq™ Products for Nano-formulated Drug Delivery

IAX-700-100	Lipodisq™ Control Sterile Solution
IAX-700-101	Curcumin Lipodisq™ Sterile Solution
IAX-700-102	Melatonin Lipodisq™ Sterile Solution
IAX-700-103	Metformin Lipodisq™ Sterile Solution
IAX-700-104	Oxyresveratrol Lipodisq™ Sterile Solution
IAX-700-105	Resveratrol Lipodisq™ Sterile Solution
IAX-700-106	Umifenovir Lipodisq™ Sterile Solution
IAX-700-107	Dexamethasone Lipodisq™ Sterile Solution
IAX-700-108	Ambroxol Lipodisq™ Sterile Solution
IAX-700-109	Retinoic Acid Lipodisq™ Sterile Solution
IAX-700-201	Lipodisq™ Styrene:Maleic Acid Copolymer 1:1 [SMA-100]
IAX-700-202	Lipodisq™ Styrene:Maleic Acid Copolymer 2:1 [SMA-200]
IAX-700-203	Lipodisq™ Styrene:Maleic Acid Copolymer 3:1 [SMA-300]
IAX-700-204	Lipodisq™ Styrene:Maleic Acid Copolymer 4:1 [SMA-400]
IAX-700-400	DMPC (1,2-Dimyristoyl-sn-glycero-3-phosphocholine) (14:0 PC)

Endotoxin-free and Sterile Buffers and Related Products

IAX-900-001	PBS Endotoxin-free (sterile)
IAX-900-001DC	PBS Endotoxin-free (sterile) [For Nano-formulated Drug Analysis]
IAX-900-002	ddWater Endotoxin-free (sterile)
IAX-900-002DC	ddWater Endotoxin-free (sterile) [For Nano-formulated Drug Analysis]
IAX-900-003	Physiological Saline [Sodium Chloride 0.9% Endotoxin-free] (sterile)
IAX-900-003DC	Physiological Saline [Sodium Chloride 0.9% Endotoxin-free] (sterile) [For Nano-formulated Drug Analysis]
IAX-900-004	PBS with EDTA Endotoxin-free (sterile)
IAX-900-005	TRIS with EDTA [TE Buffer] (100x) Endotoxin-free (sterile)
IAX-900-006	EDTA (400mM) Endotoxin-free (sterile)
IAX-900-007	HEPES Buffer (500mM) Endotoxin-free (sterile)
IAX-900-008	DNA Loading Buffer with TRIS and EDTA (6x) (Blue)
IAX-900-009	HEPES Buffer (50mM) with NaCl [Sodium Chloride] (150mM) Endotoxin-free (sterile)
IAX-900-010	NaCl [Sodium Chloride] (1.5M) Endotoxin-free (sterile)
IAX-900-011	TRIS Buffer (1.5M) Endotoxin-free (sterile)
IAX-900-012	TRIS Buffer (30mM) with NaCl [Sodium Chloride] (150mM) Endotoxin-free (sterile)
IAX-900-013	PBS with Magnesium and Calcium Endotoxin-free (sterile)
IAX-900-014	ddWater with 0.9% Benzyl Alcohol [Bacteriostatic Water] Endotoxin-free (sterile)

Document No.: IAX-700-100 | **Version:** 1.2 | **Issue Date:** 18/10/2024

DISCLAIMER: THIS PRODUCT IS NOT INTENDED OR APPROVED FOR HUMAN, DIAGNOSTICS, OR VETERINARY USE. THIS PRODUCT IS FOR RESEARCH USE ONLY (RUO).

MATERIAL SAFETY DATA: This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, inhale or allow to enter the bloodstream. Avoid contact with the eyes, or the skin, or clothing. Wash thoroughly after handling. Access to this material must be restricted to personnel, who are appropriately experienced, qualified, competent, and properly trained to use it.