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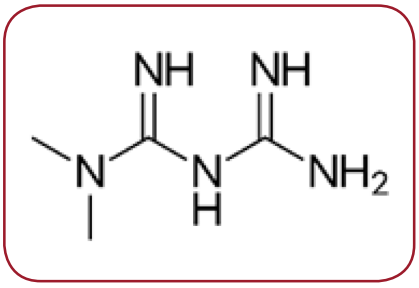

PRODUCT DATA SHEET

Metformin powered by Lipodisq™ Sterile Solution

Nano-formulated aqueous solution: Ready-to-use

Cat. No.: IAX-700-103 **Lot. No.:**

Synonyms	Dimethylbiguanide in a detergent-free nano-formulation made of styrene-maleic acid lipid particles (SMALP)
Empirical Formula	$C_4H_{11}N_5$. HCl
Concentration	1mg/ml (0.1% w/vol)
Size	1ml
MW	129.2 . 36.5
CAS	1115-70-4
Purity	≥ 95% (HPLC)
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 or pH <6.5 or >8.0, which can cause particle instability. Unformulated metformin is soluble in water or DMSO.
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) *in vivo* 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. Carrier only control: Lipodisq™ Control Sterile Solution (Cat. No.: IAX-700-100).
Shipping	Ambient
Storage	2-8°C
Stability	12 months after receipt (unopened and as supplied)
MSDS	Available on request

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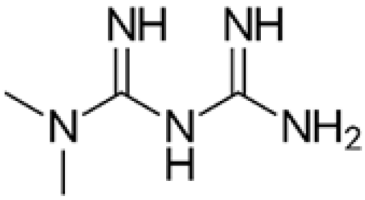

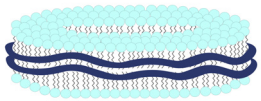

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General Information

- Metformin is an antihyperglycemic agent of the biguanide class, used for the management of type II diabetes and is currently prescribed to at least 120 million people worldwide.
- AMPK activator
- Mitochondrial electron transport chain complex I inhibitor, reducing mitochondrial reactive oxygen species (ROS).
- Antidiabetic and anti-hyperglycemic agent that reduces blood glucose levels, improves insulin sensitivity, and decreases insulin resistance.
- Insulin sensitizer in non-alcoholic fatty liver disease (NAFLD).
- Increases plasma concentrations of the glucose-lowering gut incretin hormone glucagon-like peptide-1 (GLP-1), which may contribute to metformin's glucose-lowering effect.
- Anticancer agent with antiproliferative and proapoptotic activity in cancer cell lines.
- Autophagy activator
- Targets brown adipose tissue (BAT) in vivo and reduces oxygen consumption.
- Anti-inflammatory agent by inhibition of nuclear factor κB (NF-κB) via AMPK-dependent and independent pathways. Also described to inhibit NLRP3 inflammasome activation, subsequent caspase-1 cleavage and interleukin-1β secretion.
- Since the emergence of SARS-CoV-2, Metformin has been investigated as a prophylactic agent for the prevention of COVID-19.

Metformin References

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[5] *Metformin and Covid-19: Focused Review of Mechanisms and Current Literature Suggesting Benefit.* Ibrahim S, et al. JAMA (2019); 321:1926

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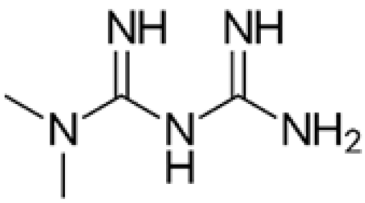

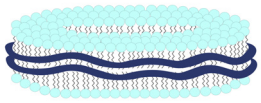

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Lipodisq™ Technology

- 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	9mg/ml	92128-87-5	295-786-7
Metformin hydrochloride	1mg/ml	1115-70-4	214-230-6

Lipodisq™ References

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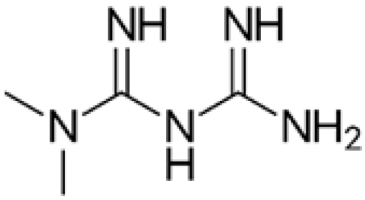

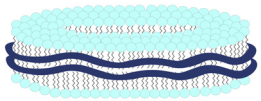

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Lipodisq™ References

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