

# LIPOSOMAL FORMULATIONS

**B-COMPLEX** \_ 120 ml Oral solution

**BENFOTIAMINE 100 mg** \_ 120 ml Oral solution

**CURCUMIN 200 mg** \_ 180 ml Oral solution

**GLUTATHIONE 450 mg** \_ 120 ml Oral solution

**R-ALPHA LIPOIC ACID 250 mg** \_ 300 ml Oral solution

**VITAMIN D3 2500 IU & K2 200 mcg** \_ 120 ml Oral solution

**VITAMIN C 1000 mg** \_ 150 ml Oral solution



**8x bioavailability**

*Dietary Supplements*



# Liposomal Formulations: the future of nutraceuticals

**Doctor's Formulas** is the leader in the field of finalized nutraceuticals and food supplements. The expertise in the innovation of liposomal products makes **Doctor's Formulas** unique in the fast-growing area of food supplements. The added value of these products is the liposomal technology, which is a meeting point of advances in delivery of active substances with the most safe and effective platform for nutraceuticals.

**Liposomes** are among the best encapsulation and delivery vehicles with many advantages and without limitations for delivery and targeting of the active substances. The innovation and the customers' specific needs are the driving forces for the development of our products which are in line with the deep knowledge of liposomal technology and high-quality standards.

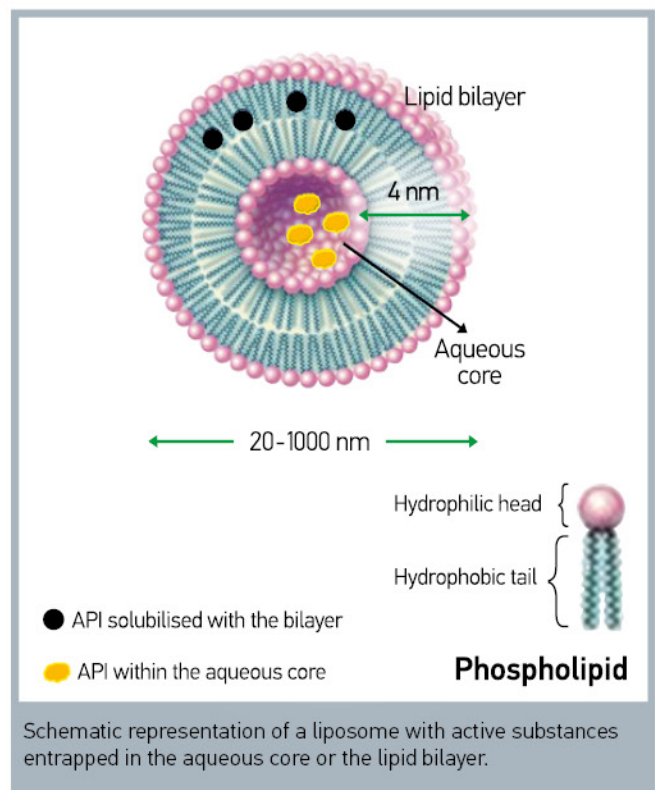
Our mission is to bring liposomal innovation to our customers wishing to generate the uniqueness of our added value products with our scientific knowledge dedicated to liposomal technology!

## Liposomes in brief

**Liposomes** are closed spherical-like vehicles consisting of an aqueous core surrounded by one or more concentrically arranged bilayer membranes. These membranes can be composed of natural or synthetic lipid surfactants.<sup>1</sup>

Liposomes can protect the entrapped active ingredient from degradation and change its bio distribution, increase its absorption and consequently its **bioavailability**.<sup>2</sup> Additional advantages of using liposomes as vesicles / drug delivery systems include their ability to encapsulate hydrophilic molecules (i.e. vitamin C) within the aqueous cavity and solubilize lipophilic compounds within the lipid bilayer.

Poor GI-stability can be overcome by incorporating the active substances in liposomes providing a protective effect towards an enzymatic attack in the GI-tract.<sup>3</sup> Furthermore, **liposomes** can, at least to some extent, diffuse into the mucus gel layer releasing their payload there, a presystemic metabolism of the active substance on the way between the delivery system and the absorption membrane can be excluded.<sup>4,5</sup>



<sup>1</sup> Demetzos C, 2015. Pharmaceutical Nanotechnology: Fundamentals and Practical Applications. Springer, ISBN: 978-981-10-0790-3. <sup>2</sup> Perrie Y, Rades T. 2012. Pharmaceutics: Drug Delivery and Targeting. FASTrack, ISBN 978 0 85711 059 6. <sup>3</sup> Bernkop-Schnürch, 2013. Eur. J. Pharm. 49(2):272-7. <sup>4</sup> Roger et al., 2010. Nanomedicine (Lond) 5(2):278-306 <sup>5</sup> Parmentier et al., 2011. Int. J. Pharm 405(1-2):210-7.

# Liposomes: An Innovative Carrier for Nutraceuticals

## ADVANTAGES

Biocompatible

Biodegradable

Co-encapsulation of hydrophilic and hydrophobic APIs

Solubilization of Lipophilic compounds

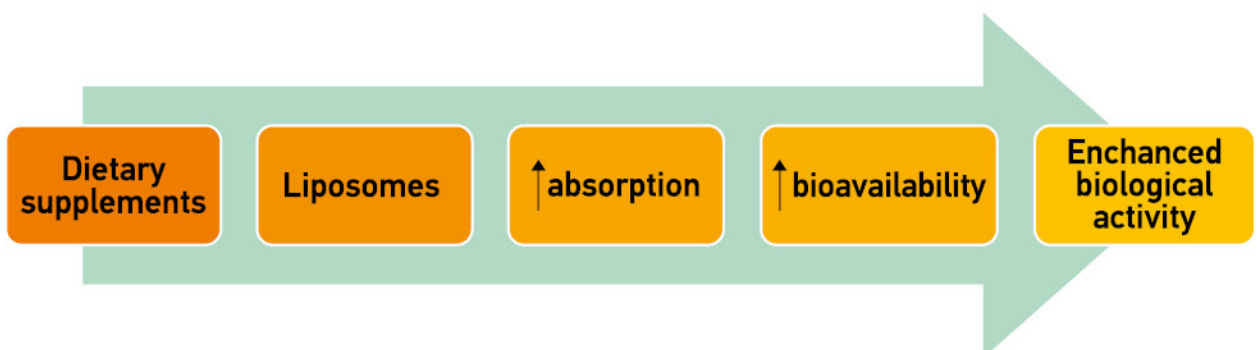
Higher absorption

Higher bioavailability

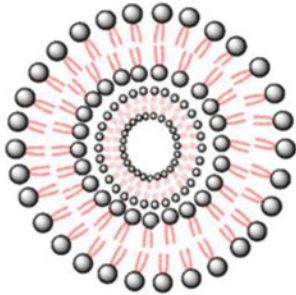
## The innovation of Doctor's Formulas liposomal products

As mentioned above, **liposomes** can be designed to optimize the **bioavailability** of the food supplements. The knowledge of the relationship between their physicochemical characteristics (i.e. size, size distribution and surface charge) is mandatory to reach this goal. The physicochemical characteristics of liposomal nutraceutical of **Doctor's Formulas** were investigated in collaboration with **Academia**.<sup>6</sup> These studies demonstrated that the colloidal particles/liposomes of formulations are in the micrometer range (around 400nm) with special/required size distribution with respect to the nature of the product particles and these physicochemical characteristics are the same in different pHs of GI. The last observation is important evidence that liposomes are stable and effective in different conditions of GI. This investigation is published in the peer-reviewed journal: "**Advanced Science, Engineering and Medicine**".

Do not hesitate to ask us more about the liposomal technology!



<sup>6</sup>Collaboration with the Laboratory of Pharmaceutical Nanotechnology, Faculty of Pharmacy, National and Kapodistrian University of Athens (under the guidance of Prof. Costas Demetzos).



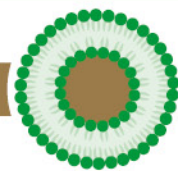
Multilamellar liposomes

- **~400nm**
  - Oral administration
- **Multi-lamellar vesicle**
  - Protection of APIs from degradation in GI
- **Positive surface charge**
  - Physicochemical stability
  - Effective interaction with biological membranes
- **Stable in different pHs**
- **Higher absorption**
- **Higher bioavailability**

## KEYPOINTS

- **Doctor's Formulas** dietary supplements contain **liposomes**, as innovative carriers for food supplements, active substances and vitamins.
- The **liposomal dosage** forms ensure **8 times greater absorption and bioavailability of the active substances** due to the added value of the liposomal carrier.
- **Liposomal mixture:** complex of phosphatidylcholines (from non-genetically modified sunflower lecithin vegetable oil) with glycerin.





## B-COMPLEX \_ 120 ml Oral solution

**B-COMPLEX** is a dietary supplement that contains B Complex Vitamins which contribute to the normal function of the nervous system, the reduction of fatigue and the normal function of the metabolic processes aiming at the production of energy in the body. Liposomal Encapsulation Technology enhances the absorption and the bioavailability of the active ingredients of the preparation.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (4ml)	% RDA
VitaminB1 (thiamine hydrochloride)	3 mg	272,73%
VitaminB2 (riboflavin)	3,4 mg	242,86%
VitaminB3 (niacin + NIACINAMIDE)	40 mg	250%
VitaminB6 (pyridoxal 5-phosphate)	4 mg	285,71%
VitaminB12 methyl cobalamin	100 mcg	4000%
Folic acid	400 mcg	200%
Biotin	600 mcg	1200%
Pantothenic acid (calcium d-pantothenate)	30 mg	500%
Inositol	25 mg	
PABA (para-amino benzoic acid)	5 mg	
Liposome mixture: complex of phosphatidylcholines (from non-genetically modified vegetable oil) with glycerol, non-genetically modified oleic acid	400 mg	

### DOSAGE

Take 4ml (approximately one teaspoon) once a day before meals, or after consulting your doctor.

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## CURCUMIN 200 mg \_ 180 ml Oral solution

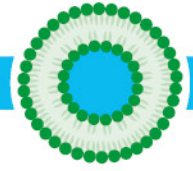
**CURCUMIN** 200 mg is a dietary supplement that consists of Turmeric Root extract (*Curcuma longa*), containing 95% curcuminoids, consisting principally of curcumin. Curcumin has antioxidant and anti-inflammatory properties, and contributes to the normal function of the gastrointestinal and immune system and the normal hepatic function. Liposomal Encapsulation Technology enhances the absorption and the bioavailability of the active ingredients of the preparation.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (6ml)
Turmeric root extract ( <i>Curcuma longa</i> , 95% content in curcumin elements)	200 mg
Liposomal mixture: complex of phosphatidylcholines (from non-genetically modified sunflower lecithin vegetable oil) with glycerin.	200 mg

### DOSAGE

Take 6ml (a little more than a teaspoon) once a day before meals, or after consulting your doctor.

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## BENFOTIAMINE 100 mg \_ 120 ml Oral solution

**BENFOTIAMINE 100 mg** is a dietary supplement that contains Vitamin B1 (as Thiamine Hydrochloride) and benfotiamine, which is the fat-soluble form of Vitamin B1 that enters cells more easily than water soluble thiamine. Thiamine contributes to the normal function of the metabolic processes to produce energy. The liposomal formulation of the product allows for better nutrient absorption.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (4ml)	% RDA
Vitamin B1 (Hydrochloride Thiamine )	25 mg	2272,73%
Benfotiamine	100 mg	
Liposomal mixture: complex of phosphatidylcholines (from non-genetically modified vegetable oil) with glycerol, non-genetically modified oleic acid	400 mg	

### DOSAGE

- Take 4ml (approximately one teaspoon) once a day before meals, or after consulting your doctor. If you like you may also mix it with water or juice.

Notification number of the EMEA: 14342/11-2-2016 / Medicines Agency (EMA) does not serve as a distribution permit from the European Medicines Agency (EMA)

## GLUTATHIONE 450 mg \_ 120 ml Oral solution

**GLUTATHIONE 450 mg** is a dietary supplement that contains glutathione, a tripeptide that consists of 3 amino acids: glutamic acid, cysteine and glycine. Liposomal Encapsulation Technology enhances the absorption and the bioavailability of the active ingredients of the preparation.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (4ml)
Glutathione	450 mg
Liposomal mixture: complex of phosphatidylcholine (from non-genetically modified sunflower lecithin)	500 mg

### DOSAGE

- Take 4 ml (approximately one teaspoon) once a day before meals, or after consulting your doctor. If you like you may also mix it with water or juice.

Notification number of the EMEA: 48978/14-6-2016 / Medicines Agency (EMA) does not serve as a distribution permit from the European Medicines Agency (EMA)

## R-ALPHA LIPOIC ACID 250 mg \_ 300 ml Oral solution

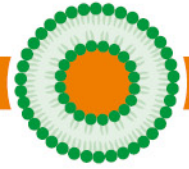
**R-ALPHA LIPOIC ACID 250 mg** is a dietary supplement that contains R-alpha lipoic acid. Liposomal Encapsulation Technology enhances the absorption and the bioavailability of the active ingredients of the preparation.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (10ml)
R-alpha lipoic acid	250 mg
Liposomal mixture: complex of phosphatidylcholine (from non-genetically modified sunflower lecithin) with glycerol, non-genetically modified oleic acid	400 mg

### DOSAGE

- Take 10 ml (approximately two teaspoons) once a day before meals, or per your doctor's advice. If you like you may also mix it with water or juice.

Notification number of the EMEA: 48976/14-6-2016 / Medicines Agency (EMA) does not serve as a distribution permit from the European Medicines Agency (EMA)



## VITAMIN C 1000 mg \_ 150 ml Oral solution

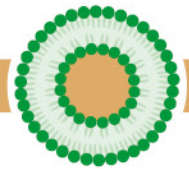
- **VITAMIN C 1000 mg** is a dietary supplement that contains Vitamin C (as ascorbic acid and sodium ascorbate). Liposomal Encapsulation Technology enhances the absorption and the bioavailability of the active ingredients of the preparation.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (5ml)	% RDA
Vitamin C (as ascorbic acid and sodium ascorbate)	1000 mg	1.250
Sodium (assodiumascorbate)	94 mg	
Liposomal complex: complex of phosphatidylcholines (from non-genetically modified sunflower lecithin) with Glycerin	500 mg	

### DOSAGE

- Take 5ml (a little less than a teaspoon) once a day before meals, or after consulting your doctor. If you like you may also mix it with water or juice.

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## VITAMIN D3 2500 IU & K2 200 mcg \_ 120 ml Oral solution

- **VITAMIN D3 & K2** is a dietary supplement that contains Vitamins D3 and K2, which contribute to the maintenance of normal levels of calcium in blood and normal bone function. The liposomal formulation of the product allows for better nutrient absorption.

COMPOSITION IN ACTIVE INGREDIENTS	Per daily dose (2ml)
Vitamin D3	2.500 IU
Vitamin K (as menaquinone-7)	200 mcg
Liposomal mixture: complex of phosphatidylcholine (from non-genetically modified sunflower lecithin)	200 mg

### DOSAGE

- Take 2ml (approximately half a teaspoon) once a day before meals, or after consulting your doctor. If you like you may also mix it with water or juice.

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**PRECAUTIONS:** ● Do not exceed the recommended daily dose. ● Dietary supplements should not be used as a substitute of a balanced diet. ● Keep away from young children. ● This product is not intended for the prevention, cure or treatment of a human disease. ● Consult with your doctor if you are pregnant, breast-feeding, taking pharmaceutical treatment or having health problems.