
	Document ID:	TDS-BSK-002-500ML	Version:	001
	Date of Issue:	10-OCT-2024	Approved by:	Dr. Iman Kamranfar
	Review Date:	10-JAN-2025	Signature:	
	Title:	TECHNICAL DATASHEET		

BSK-H Medium for the cultivation of *Borrelia spec.*



Filtration/ Treatment	Without Rabbit Serum and Phenol Red, Sterile Filtered
Product Code	BSK-002-500ML
Shelf Life	24 months from DOM
Storage Temperature	+2 to +8°C
Shipping Temperature	ambient

QC Specifications

Physical and Chemical Analysis	Method	Specifications	Units
Appearance	Visual	Clear solution	n/a
pH at RT	Electronic pH Meter	7.5 – 7.7	n/a
Osmolality	Osmometer	410 - 480	mOsm/kg
Sterility			
Aerobic Bacteria	Internally Validated	Not detected	n/a
Anaerobic Bacteria	Internally Validated	Not detected	n/a
Fungi (Yeast & Mold)	Internally Validated	Not detected	n/a
Mycoplasma	qPCR	Not detected	n/a

Formulation

Amino Acids	CAS number	Concentration (mg/L)
L-Alanine	56-41-7	25.00
L-Arginine HCl	1119-34-2	70.00
L-Aspartic Acid	56-84-8	30.00
L-Cysteine HCl H2O	7048-04-6	260.00
L-Cystine	56-89-3	20.00
L-Glutamic Acid	56-86-0	75.00
L-Glycine	56-40-6	50.00
L-Histidine HCl H2O	5934-29-2	20.00
Trans-4-Hydroxy-L-Proline	51-35-4	10.00
L-Isoleucine	73-32-5	20.00
L-Leucine	61-90-5	60.00
L-Lysine HCl	657-27-2	70.00
L-Methionine	63-68-3	15.00
L-Phenylalanine	63-91-2	25.00
L-Proline	147-85-3	40.00
L-Serine	56-45-1	25.00
L-Threonine	72-19-5	30.00
L-Tryptophan	73-22-3	10.00
L-Tyrosine	60-18-4	40.00
L-Valine	72-18-4	25.00
Vitamins		
L- Ascorbic Acid	50-81-7	50.00
Biotin	58-85-5	0.01
D-Calcium Pantothenate	137-08-6	0.01
Cholesterol	57-88-5	0.20
Choline Chloride	67-48-1	0.50
Folic Acid	59-30-3	0.01
Myo-Inositol	87-89-8	0.05
Niacinamide	98-92-0	0.025
Niacin	59-67-6	0.025
Para aminobenzoic Acid (PABA)	150-13-0	0.05
Pyridoxal HCl	65-22-5	0.025
Pyridoxine HCl	58-56-0	0.025
Riboflavin	83-88-5	0.01
Thiamine HCL	67-03-8	0.01

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Inorganic Salts		
Calcium chloride Dihydrate	10035-04-8	264.92
Potassium chloride	7447-40-7	400.00
Magnesium sulfate anhydrous	7487-88-9	97.69
Sodium chloride	7647-14-5	6800.00
Sodium bicarbonate	144-55-8	2200.00
Sodium phosphate monobasic monohydrate	10049-21-5	140.00
Nucleosides/Nucleotides		
2'-Deoxyadenosine Monohydrate	16373-93-6	11.60
2'-Deoxycytidine, Hydrochloride	3992-42-5	11.60
2'-Deoxyguanosine Monohydrate	312693-72-4	11.60
Thymidine	50-89-5	10.00
5-Methyldeoxycytidine	838-07-3	0.1
Flavin Adenine Dinucleotide Disodium	84366-81-4	0.11
β-NAD	53-84-9	7.00
β-NADP 2Na	24292-60-2	1.00
Uridine-5-Triphosphate 3Na	116295-90-0	1.00
Other Components		
N-Acetyl-D-Glucosamine	7512-17-6	400.00
Coccarboxylase (Thiamine pyrophosphate)	154-87-0	1.00
Coenzyme A 3H ₂ O	85-61-0	2.50
Bovine serum Albumin	9048-46-8	50000.00
Neopeptone	12710-34-8	5000.00
Yestolate (yeast extract)	8013-01-2	2000.00
D-Glucose, Anhydrous	50-99-7	6000.00
Glutathione Reduced	70-18-8	10.00
Sodium Acetate anhydrous	127-09-3	50.00
Sodium Glucuronate monohydrate	207300-70-7	4.20
Citric Acid tetrasodium anhydrous	68-04-2	700.00
Pyruvic Acid, Sodium Salt	113-24-6	800.00
HEPES	7365-45-9	6000.00
Tween 80	9005-65-6	5.00



GENERAL INFORMATION

BSK-H medium is a specialized highly enriched growth medium used for the cultivation of *Borrelia* species, particularly *Borrelia burgdorferi*, the bacterium responsible for Lyme disease. The formulation is a modified version of Barbour-Stoenner-Kelly (BSK) medium, designed to enhance the growth of *Borrelia* and other spirochetes under laboratory conditions.

BSK-H Medium Composition:

BSK-H medium is a complex formulation with an extraordinarily high content of proteins and peptides. Besides having high concentrations of vitamins, nucleosides, and amino acids, it also contains:

- **Peptones:** a nitrogen source and provide amino acids for bacterial growth.
- **Serum Albumin:** a nitrogen source and amino acids.
- **Glucose:** a primary carbon and energy source for bacterial metabolism.
- **Yeast Extract:** supplies vitamins, minerals, and growth factors that are essential for bacterial development.
- **Citrate and Cysteine:** serve as buffering agents and provide sulfur, which is necessary for enzyme activity.
- **N-Acetyl-D-Glucosamine:** an essential element of the bacterial peptidoglycan.
- **HEPES:** guarantees a stable buffer capacity for a long time.

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Applications of BSK-H Medium:

- Culturing *Borrelia* Species:** The primary application of BSK-H medium is the cultivation of *Borrelia burgdorferi*, which is difficult to grow on standard bacterial media. It supports the slow growth rate of *Borrelia* under low oxygen conditions.
- Research on Lyme Disease:** In laboratories, BSK-H medium is essential for isolating and studying *Borrelia* spirochetes from clinical samples like ticks, blood, or tissues of infected hosts. This enables the investigation of *Borrelia*'s biology, pathogenesis, and potential treatment strategies.
- Antimicrobial Susceptibility Testing:** BSK-H medium is used to test the effectiveness of antibiotics against *Borrelia* species. This helps in evaluating new therapeutic approaches for Lyme disease.
- Diagnostics:** Some diagnostic laboratories use BSK-H medium to culture *Borrelia* from patient samples in an attempt to confirm infection.

INSTRUCTIONS FOR USE

- BSK-H Medium is supplied as a sterile-filtered liquid. After thawing, mix well by inverting the bottle prior to use. If the thawed medium will not be used within a few days, it is recommended that it be refrozen in working aliquots to avoid repeated free-thaw cycles.
- Add sterile filtered Rabbit Serum (Serana's Product code: *S-RB-EU-011*) in a final concentration of 6% if they have not been added in formulation (i.e Serana's Product code: *BSK-001-500ML*). You could alternatively use complete medium supplemented 6% Rabbit serum (i.e Serana's Product code: *BSK-003-500ML*).
- BSK-H medium can be widely used for the cultivation of spirochetes, especially for *B. burgdorferi* and *B. hermsii*. Only small amounts of organisms are sufficient for the inoculation. The generation time lies between 11 and 18 hours, so that in 7 to 9 days $0.5 - 4.0 \times 10^8$ cells/ml can be obtained.



PRECAUTIONS AND DISCLAIMER

This product is for research use only. For information regarding hazards and safe handling practices, please see the Material Safety Data Sheet.

Do not use this medium beyond the expiration date indicated on the product label.

REFERENCES

- Bottenstein et al. (1979), *Methods in Enzymology*; 58: 94–109.
- Guilbert, L.J., and Iscove, N.N., (1976), Partial replacement of serum by selenite, transferrin, albumin, and lecithin on haemopoietic cell culture. *Nature*, 263,594-595.
- Ham, R.G., and McKeehan, W.L., (1979), Media and growth requirements. *Methods in Enzymology*, 58, 44-93
- Hinman, J.W., Prostaglandins. *Ann. Rev. Biochem.*, 41, 161-178 (1972).
- Kano-Sueoka, T., and Errick, J.E., (1981). Effects of phosphoethanolamine and ethanolamine on growth of mammalian carcinoma cells in culture. *Exp. Cell Res.*, 97, 120-126.
- Kelley, D.S. et al., (1978), Effects of insulin, dexamethasone, and glucagon on the amino acid transport ability of four rat hepatoma cell lines and rat hepatocytes in culture. *Cancer Res.*, 38, 4591-4601.
- McKeehan, W.L. et al., (1976), Selenium is an essential trace nutrient for the growth of WI-38 diploid human fibroblasts. *Proc. Natl. Acad. Sci., USA*, 73, 2023-2027.
- McKeehan, W.L., and McKeehan, K.A., (1979). Oxocarboxylic acids, pyrimidine nucleotide-linked oxidoreductase and serum factors in regulation of cell proliferation. *J. Cell Physiol.*, 101, 9-16.
- Murikami, H. et al., (1982), Growth of hybridoma cells in serum-free medium: ethanolamine is an essential component. *Proc. Natl. Acad. Sci., USA*, 79, 1158-1162.
- Polack et al., (1993), Standardization of Medium for Culturing Lyme Disease Spirochetes. *J. Clinical Microbiology*, p. 1251-1255.
- Wolpe, S.D., in *Mammalian Cell Culture*. J.P. Mather ed., Plenum Pres.

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Product Use: This product is intended for laboratory use only.