PRODUCT SPECIFICATION SHEET

Stuart Transport Medium (Transport Medium, Stuart) (DM250)

Intended Use

Stuart Transport Medium (Transport Medium, Stuart) (DM250) is recommended for preservation and transportation of *Neisseria* species and other fastidious organisms from clinic to the laboratory.

Product Summary and Explanation

This medium is a chemically defined, semisolid, non-nutrient medium which prevent microbial proliferation. Transport media are chemically defined, semisolid, non-nutritive, phosphate buffered media that provide a reduced environment. Transport media are formulated to maintain the viability of microorganisms without significant increase in growth. In 1948, Moffett, Young and Stuart described a medium for transporting gonococcal specimens and other fastidious organisms during their transport from clinic to laboratory.[1] Originally formulated for the conservation of *Neisseria gonorrhoeae* and *Trichomonas vaginalis*, it may also be used for the transport of other bacteriological specimens. Stuart, Toshach and Patsula improved this formulation, introducing what is now known as Stuart's Transport Medium.[2] Ringertz included thioglycollate in the Stuart Medium and omitted charcoal.[3] The ability of Stuart's medium to maintain the viability of gonococci during transport led other researchers to explore its use with a variety of specimens. This medium is currently recommended for throat, vaginal and wound samples. Originally formulated for the conservation of *Neisseria gonorrhoeae* and *Trichomonas vaginalis*, it may also be used for the transport of other bacteriological specimens. Stuart et al.[4] noted that the transport medium may also be used for *Haemophilus influenzae, Streptococcus pneumoniae, Streptococcus pyogenes* and *Corynebacterium diphtheriae*. Cooper[5] investigated the extension of Stuart's method to the transport of swabs of clinical material containing upper respiratory tract and enteric pathogens. Stuart[6] published an account of his experiences of the medium in a public health bacteriology, whilst Crookes and Stuart[7] used the transport medium in combination with polymyxin B for the cultivation of *N. gonorrhoeae*. Because of this composition the medium ensures that microorganisms present are able to survive for a sufficiently long period of time.

Principles of the Procedure

Stuart Transport Medium contains calcium chloride along with sodium glycerophosphate acts as good buffering agent and also maintains osmotic equilibrium in the medium, while controlling permeability of bacterial cells. Sodium thioglycollate suppresses oxidative changes and provides a reduced environment. The medium provides an adequate degree of anaerobiosis which can be monitored by means of the redox indicator methylene blue. Methylene blue is a colorimetric pH indicator of the oxidation-reduction state.

Formula / Liter

Ingredients	Gms / Liter
Sodium glycerophosphate	10.00
Sodium thioglycollate	1.00
Calcium chloride	0.10
Methylene blue	0.002
Agar	3.00
Final pH: 7.4 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 14.1 grams of the medium in one liter of distilled water.
2. Heat to boiling, to dissolve the medium completely.
3. Dispense into tubes with screw caps to give a depth of approximately 7 cm.
4. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle and after sterilization tighten the caps.

5. Cool the tubes immediately in an upright position.
6. Care should be taken that the water is free from chlorine.

Quality Control Specifications

Dehydrated Appearance	White to light blue coloured homogeneous free flowing powder
Prepared Medium	Colourless to whitish coloured slightly opalescent butt with upper 10% or less portion blue on standing
Reaction of 1.41% solution	pH 7.4 ± 0.2 at 25°C
Gel Strength	Semisolid, comparable with 0.3% Agar gel.

Expected Cultural Response: Cultural characteristics observed after an incubation at 35 - 37°C for 72 hours when subcultured from Stuart Transport Medium.

Sr. No.	Organisms	Results to be achieved	
		Inoculum (CFU)	Subculture Medium
1.	*Haemophilus influenza ATCC 49247*	good	Chocolate Agar (incubated in CO_2 atmosphere)
2.	*Neisseria gonorrhoeae ATCC 19424*	good	Chocolate Agar (incubated in CO_2 atmosphere)
3.	*Streptococcus pneumoniae ATCC 6303*	good	Tryptone Soya Agar with 5% sheep blood

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Preparation of Charcoal Swabs for use with Transport Medium:

1. Prepare swabs by rolling absorbent cotton-wool on wooden sticks.
2. Boil the swabs in a phosphate buffer solution of the following composition:

Ingredients	Gms / 100ml
Disodium hydrogen phosphate	0.81
Potassium dihydrogen phosphate	0.18
Distilled water	100ml
Final pH: 7.4	

3. Immediately dip the swabs into a 1% suspension of charcoal (pharmaceutical grade).
4. Place in cotton-wool plugged test tubes and sterilise in the autoclave at 121 °C for 15 minutes.
5. Dry at 100°C to remove any excess moisture.

Transport of Swabs:

1. Obtain specimen with sterile swab. Insert specimen swab(s) into the upper third of the medium in the transport container.
2. Cut with sterile scissors or break-off the protruding portion of the swab stick. Tightly screw the lid on the bottle or vial.
3. Label the bottle or vial and send to the laboratory with minimum delay. Specimens may be refrigerated until ready for shipment.
4. Submit to laboratory within 24 hours for culture and analysis.

Results

1. Survival of bacteria in a transport medium depends on many factors including the type and concentration of bacteria in the specimen, the formulation of the transport medium, the temperature and duration of transport and inoculation to appropriate culture media within 24 hours.
2. Optimal growth and typical morphology can only be expected following direct inoculation and appropriate cultivation.

Storage

Store the sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration
Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure
1. Specimens taken from transport media will not exhibit the optimal or comparative growth as expected from direct inoculation and cultivation. These media do, however, provide an adequate degree of preservation for those specimens which cannot be forwarded immediately to the laboratory for prompt evaluation.
2. Viability of cells will diminish over time and some degree of multiplication or growth of contaminants can occur during prolonged periods of transit. This is particularly true of fecal specimens that contain substantial numbers of coliform organisms.
3. The condition of the specimen received by the laboratory for culture is a significant variable in recovery and final identification of the suspect pathogen. An unsatisfactory specimen (overgrown by contaminants, containing nonviable organisms, or having the number of pathogens greatly (diminished) can lead to erroneous or inconclusive results.
4. Prepared sterile medium will undergo a slight degree of oxidation at the upper periphery of the medium, however, if the tube or vial exhibits a distinct blue colour throughout the medium, it should be discarded.
5. Consult appropriate texts for detailed information and recommended procedures.

Packaging
Product Name : Stuart Transport Medium (Transport Medium, Stuart)
Product Code : DM250
Available Pack sizes : 100gm/500gm

References

1. Moffett, Young and Stuart. 1948. Br. Med. J. 2:421.
2. Stuart, Toshach and Patsula, 1954, Can. J. Public Health, 45:73.
3. Ringertz, 1960, Acta Pathol. Microbiol. Scand., 48:105.
4. Stuart R. D., Toshach S.R. and Patsula T.M. (1954) Canad. J. Publ. Hlth 45. 13-83.
5. Cooper G. N. (1967) J. Clin. Path. 10. 226-230.
6. Stuart R. D. (1959) Pub. Hlth Rep. Wash. 74. 431-438.
7. Crookes E.M.L. and Stuart R. D. (1959) J. Path. Bact. 78. 283-288.

Further Information
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