*Phyto*Technology's Deficient Plant Tissue Culture Media Selection

*Phyto*Technology Laboratories offers numerous deficient media designed for nutritional research of plant cell cultures. These media are deficient in key elements, thus allowing the researcher the opportunity to vary the concentrations of a particular element.

*Phyto*Technology Laboratories offers the following deficient media in either dry powder form or as a liquid concentrate up to 100X:

- Deficient Murashige and Skoog Based Media
- Deficient Lloyd & McCown's Woody Plant Media
- Nitrogen-free MS Based Media
- Ammonia-free MS Based Media
- Potassium Phosphate-free MS Based Media
- Murashige and Skoog Macronutrient Liquid or Powdered Stock Bases
- Murashige and Skoog Micronutrient Liquid or Powdered Stock Bases
- Lloyd & McCown's WPM Micronutrient Stock Base
- Deficient Schenk & Hildebrandt Basal Media

All of our media are manufactured according to cGMP guidelines in our environmentally controlled manufacturing facility in Overland Park, Kansas. Each medium is first tested for specific physio-chemical specifications and then biologically tested with at least two commercially significant plant cell lines. *Phyto*Technology Laboratories is committed to maintaining inventory of its entire selection of plant tissue culture media. Some features of our manufactured media include:

- All media components meet USP or ACS quality standards where applicable.
- *Phyto*Technology Laboratories has the capacity to manufacture batches of certain media up to 50,000 liters.
- Using powder media simplifies medium production and reduces technician error when preparing individual batches of medium.
- *Phyto*Technology Laboratories can custom package media orders into sizes that fit your needs. This allows the user to simply open the bottle or foil bag and pour out the entire contents, eliminating the steps the user would have to take to weigh out the individual components themselves.
- *Phyto*Technology Laboratories offers a Lot Reservation Program for manufactured media which allows you to reserve a specific lot of a medium for your research purposes. We will set aside this batch of medium and when you order, you will receive media from the lot that was reserved. This is great for customers who do not have room to store bulk amounts of media, but would like the consistency of using the same lot of medium throughout their research. This reservation program is offered at no additional cost, however size restrictions may apply.
- Custom liquid and powdered media manufacturing is available in batches ranging from 100 liters up to 25,000 liters. Formulations are kept confidential. Contact us for more details.
- There is no minimum when ordering stock products from *Phyto*Technology Laboratories.

_Phyto_Technology Laboratories®
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The following table will help in the selection of a base media for use in your research applications.
(Click on a product number to visit the product page on our website.)

Product Number	Product Description	Liquid vs. Powder	Media Base	Ammonium Nitrate	Potassium Nitrate	Macro-nutrients	Micro-nutrients	Other
L444	Lloyd & McCown Woody Plant Micronutrient Mixture	P	WPM	NA	NA	NA	1 X	
M153	Murashige & Skoog Modified Medium(½X)	P	MS	½ X	½ X	½ X	½ X	Contains ½ X Macro- & ½X Micronutrients
M290	Murashige & Skoog Modified Basal Salt Mixture	P	MS	½ X	½ X	1 X	1 X	Contains ½ X Ammonium Nitrate, Potassium Nitrate & Calcium Chloride
M407	Murashige & Skoog Modified Basal Salt Mixture	P	MS	0	0	1 X	1 X	Media contains no nitrogen, potassium, or phosphorous
M502	Murashige & Skoog Macronutrient Salts	P	MS	1 X	1 X	1 X	NA	
M524	Murashige & Skoog Basal Salt Mixture	P	MS	1 X	1 X	1 X	1 X	
M529	Murashige & Skoog Micronutrient Stock Solution (10X)	L	MS	NA	NA	NA	10 X	USP sterility tested.
M531	Murashige & Skoog Modified Basal Salts—No Nitrogen	P	MS	0	0	1 X	1 X	Contains no Ammonium Nitrate or Potassium Nitrate
M541	Murashige & Skoog Modified Basal Medium (No KH_2PO_4)	P	MS	1 X	1 X	1 X	1 X	Contains no KH_2PO_4 - Contains (mg/L): 300 Sodium Phosphate Monobasic, 150 Adenine Hemisulfate, And 1000 Casein Hydrolysate. Ferrous Sulfate and Disodium EDTA are replaced with Ferric Sodium EDTA
M561	Murashige & Skoog Modified Basal Salts—1/2 Nitrogen	P	MS	½ X	½ X	1 X	1 X	Contains ½ X Ammonium Nitrate and Potassium Nitrate
M571	Murashige & Skoog Modified Basal Salts (No NH_4NO_3)	P	MS	0	1 X	1 X	1 X	Contains no Ammonium Nitrate
M654	Murashige & Skoog Macronutrient Stock Solution (10X)	L	MS	10 X	10 X	10 X	NA	Contains 10x macronutrients- USP sterility tested.
S806	Schenk & Hildebrandt Modified Basal Salt Mixture	P	S&H	NA	1X	1X	1X	No Calcium Chloride
S808	Schenk & Hildebrandt Modified Basal Medium	P	S&H	NA	½X	½X	½X	Contains 10 g/L Sucrose, ½X Vitamins ½X Micro- & ½X Macronutrients

NA= Not Applicable/Not included

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Nutrient Components of *Phyto*Technology's Deficient Media

(Click on a product number to visit the product page on our website.)

All component units are in mg/L	Lloyd &McCown's WPM Micronutrient Mixture	MS Modified Basal Salts (½X Macro & Micronutrients)	MS Modified Basal Salt Mixture	MS Modified Basal Salt Mixture (No N, P, or K)	MS Macronutrient Salt Base (1X)	MS Basal Salt Mixture	MS Micronutrient Stock Solution (10X)	MS Modified Basal Salt Mixture (No Nitrogen)	MS Modified Basal Medium (No KH_2PO_4)	MS Modified Basal Salt Mixture (1/2 X Nitrogen)	MS Modified Basal Salt Mixture (No NH_4NO_3)	MS Macronutrient Stock Solution (10X)	Schenk & Hildebrandt Modified Basal Salt Mixture (No Calcium)	Schenk & Hildebrandt Modified Basal Medium
COMPONENT	**L444**	**M153**	**M290**	**M407**	**M502**	**M524**	**M529**	**M531**	**M541**	**M561**	**M571**	**M654**	**S806**	**S808**
Ammonium Nitrate		825.0	825.0		1650	1650			1650	825.0		16500		
Ammonium Phosphate, Monobasic													300.0	150.0
Boric Acid	6.2	3.1	6.2	6.2		6.2	62	6.2	6.2	6.2	6.2		5.0	2.5
Calcium Chloride Anhydrous	72.5	166.1	166.1	332.2	332.2	332.2		332.2	332.2	332.2	332.2	3322		75.5
Cobalt Chloride•$6H_2O$		0.0125	0.025	0.025		0.025	0.25	0.025	0.025	0.025	0.025		0.10	0.05
Cupric Sulfate•$5H_2O$	0.25	0.0125	0.025	0.025		0.025	0.25	0.025	0.025	0.025	0.025		0.20	0.10
FeNaEDTA									36.7					
Na_2-EDTA	37.3	18.63	37.26	37.26		37.26	373	37.26		37.26	37.26		20.0	10.0
Ferrous Sulfate•$7H_2O$	27.85	13.9	27.8	27.8		27.8	278	27.8		27.8	27.8		15.0	7.5
Magnesium Sulfate	180.7	90.35	180.7	180.7	180.7	180.7		180.7	180.7	180.7	180.7	1807	195.4	97.7
Manganese Sulfate•H_2O	22.3	8.45	16.9	16.9		16.9	169	16.9	16.9	16.9	16.9		10.0	5.0
Molybdic Acid •$2H_2O$ (SodiumSalt)	0.25	0.125	0.25	0.25		0.25	2.5	0.25	0.25	0.25	0.25		0.10	0.05
Potassium Iodide		0.415	0.83	0.83		0.83	8.3	0.83	0.83	0.83	0.83		1.0	0.50
Potassium Nitrate		950.0	950.0		1900	1900			1900.0	950.0	1900.0	19000	2500	1250.0
Potassium Phosphate Monobasic	170.0	85.0	170.0		170.0	170.0		170.0		170.0	170.0	1700		
Sodium Phosphate Monobasic									300.0					
Zinc Sulfate•$7H_2O$	8.6	4.3	8.6	8.6		8.6	86	8.6	8.6	8.6	8.6		1.0	0.5
Adenine Hemisulfate									150.0					
Casein, Enzymatic Hydrolysate									1000					
Glycine									2.0					
myo-Inositol									100.0					500
Nicotinic Acid									5.0					2.5
Pyridoxine•HCl									1.0					0.25
Thamine•HCl									0.5					2.5
Sucrose														10,000
Grams of powder to make 1L of medium	0.53	2.17	2.39	0.61	4.23	4.33	N/A	0.78	5.69	2.56	2.68	N/A	3.05	12.10

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