P.O. Box 3286 - Logan, Utah 84323, U.S.A. - Tel. (800) 729-8350 – Tel. (435) 755-9848 - Fax (435) 755-0015 - www.scytek.com

Movat Pentachrome Stain Kit
(Modified Russell-Movat)

Description: The Movat Pentachrome Stain Kit (Modified Russel-Movat) is intended for use in histological demonstration of collagen, elastin, muscle, and mucin in tissue sections. This procedure has historically been particularly useful when studying the heart, blood vessels and various vascular diseases.

Elastic Fibers:	Black
Nuclei:	Blue/Black to Red
Collagen:	Yellow to Red
Mucin:	Bright Blue
Muscle:	Red

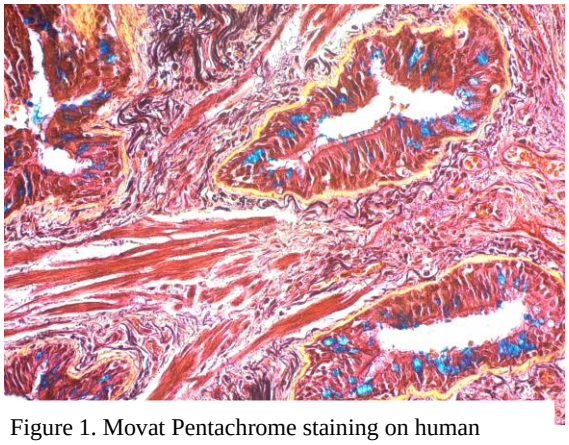

Figure 1. Movat Pentachrome staining on human lung.

Uses/Limitations:
Not to be taken internally.
For In-Vitro Diagnostic use only.
Histological applications.
Do not use if reagents become cloudy.
Do not use past expiration date.
Use caution when handling reagents.
Non-Sterile.

Control Tissue: Lung, Skin, Colon, Heart or any vascular tissue.

Storage: Store all kit components at room temperature (18-25°C)

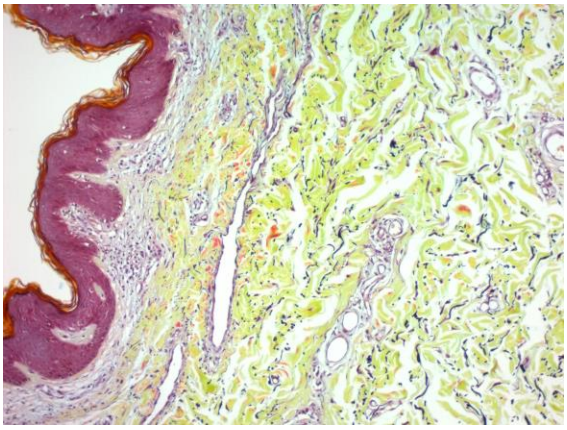

Figure 1. Movat Pentachrome staining on human skin.

Ordering information regarding individual components on back page

Kit Contents:

Item #	Components	Volume
HSV250	Hematoxylin Solution (5%)	250ml
FCC125	Ferric Chloride Solution (10%)	125 ml
LIS125	Lugol's Iodine Solution	125 ml
FCB125	Ferric Chloride (2%) Differentiating Solution	125 ml
STB125	Sodium Thiosulfate Solution (5%)	125 ml
AAG125	Acetic Acid Solution (3%)	125 ml
AAE250	Acetic Acid Solution (1%)	250 ml
ANC125	Alcian Blue Solution, pH 2.5	125 ml
BSU125	Biebrich Scarlet – Acid Fuchsin Solution	125 ml
PGC250	Phosphotungstic Acid Solution (5%)	250 ml
MYQ125	Metanil Yellow Solution	125 ml

Storage: 18° C 25° C

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Precautions: Keep away from open flame.
Avoid contact with skin and eyes.
Harmful if swallowed.
Follow all Federal, State, and local regulations regarding disposal.
Use in chemical fume hood whenever possible.

Preparation of Reagents Prior to Beginning:

1. Prepare working Elastic Stain Solution by mixing: (mixed solution may be used for 24 hours)
   30ml Hematoxylin Solution (5%)
   15ml Ferric Chloride Solution (10%)
   15ml Lugol's Iodine Solution.
2. **Note:** Lugol's Iodine Solution will cause staining of all kit vials and labels over time. This does not adversely affect the performance of this product and is merely cosmetic in nature.
3. **Note:** Removal of mercury deposits is not required for tissues that have been fixed in mercury containing fixatives since it will be removed by the staining solution.

Procedure:

1. Deparaffinize sections if necessary and hydrate to distilled water.
2. Stain tissue section with working Elastic Stain Solution for 20 minutes. **Note:** *This solution has a high alcohol content and is susceptible to evaporation. If staining on horizontal slide, monitor and add more stain as needed to prevent stain from drying on slide.*
3. Rinse in running tap water until no excess stain remains on slide.
4. Dip slide in Ferric Chloride (2%) Differentiating Solution 5-15 times and rinse in tap water.
5. Check slides microscopically for proper differentiation. Repeat step 4 if required.
6. Rinse in 2 changes of distilled water.
7. Place slide in Sodium Thiosulfate Solution (5%) and incubate for 1 minute.
8. Rinse in tap water for 2 minutes followed by 2 changes in distilled water.
9. Place slide in Acetic Acid Solution (3%) and incubate for 2 minutes to equilibrate tissue prior to staining with Alcian Blue Solution, pH 2.5.
10. Without rinsing, place slide in Alcian Blue Solution, pH 2.5 and incubate for 25 minutes.
11. Rinse in tap water for 2 minutes followed by 2 changes in distilled water.
12. Place slide in Biebrich Scarlet – Acid Fuchsin Solution and incubate for 2 minutes.
13. Rinse slide in 2 changes of distilled water.
14. Place slide in Acetic Acid Solution (1%) for 5-10 seconds with agitation.
15. Rinse quickly in distilled water.
16. Differentiate slide in 2 changes of Phosphotungstic Acid Solution (5%) for 3-7 minutes each.
17. Rinse slide briefly in distilled water.
18. Incubate slide in Acetic Acid Solution (1%) for 1 minute. This step is important for removing Phosphotungstic acid bound to the tissue.
19. Shake off excess Acetic Acid Solution (1%) and without rinsing apply Metanil Yellow Solution and incubate for 10-15 minutes.
20. Rinse slide in absolute alcohol. Dehydrate in absolute alcohol.
21. Clear, and mount in synthetic resin.

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Troubleshooting:

1. Elastin: If finer elastin fibers are expected but not seen, decrease number of dips or incubation in the Ferric Chloride solution (FCB) on step 4. We would suggest under-differentiating at first to locate all available elastin, and then increasing differentiation with subsequent slides if a greyish appearance is left on the tissue due to under-differentiation

2. Muscle and Collagen: The final stains of the procedure (Biebrich Scarlet – Acid Fuchsin Solution and Metanil Yellow Solution) are a trichrome-type of staining that is quite sensitive to incubation time and temperature. The "differentiating solution" (Phosphotungstic Acid Solution (5%)) on step 16 is also sensitive to incubation time and temperature:

Collagen is colorless, not yellow: *decrease incubation time of differentiating solution Phosphotungstic Acid Solution (5%) (PGC) on step 16. Increase incubation time in Metanil Yellow solution (step 19). Ensure incubation step in acetic acid (step 18) is performed.*

Collagen is red, not yellow: *increase incubation time in differentiation solution Phosphotungstic Acid Solution (5%) (PGC) on step 16.*

Muscle and background are too yellow: *decrease incubation time in Metanil Yellow solution (step 19)*

3. **Metanil Yellow precipitation*****:*** *If any solid is noticed in the Metanil Yellow Solution this is to be expected and should not affect performance. The dye is present near saturated concentrations. If removing solid is preferred, gently warm and shake to re-dissolve solid or filter at no smaller than 3µm.*

References:

1. Alfonso, Abraham R., Sasmita Rath, Parvin Rafiee, Mario Hernandez-Espino, Mahreen Din, Florence George, and Sharan Ramaswamy. "Glycosaminoglycan Entrapment by Fibrin in Engineered Heart Valve Tissues." Acta Biomaterialia 9, no. 9 (September 1, 2013): 8149–57. https://doi.org/10.1016/j.actbio.2013.06.009.
2. Dahal, Sudip, Peter Huang, Bruce T. Murray, and Gretchen J. Mahler. "Endothelial to Mesenchymal Transformation Is Induced by Altered Extracellular Matrix in Aortic Valve Endothelial Cells." Journal of Biomedical Materials Research Part A 105, no. 10 (2017): 2729–41. https://doi.org/10.1002/jbm.a.36133.
3. Deb, Partha Pratim, and Anand Ramamurthi. "Spatiotemporal Mapping of Matrix Remodelling and Evidence of in Situ Elastogenesis in Experimental Abdominal Aortic Aneurysms." Journal of Tissue Engineering and Regenerative Medicine 11, no. 1 (2017): 231–45. https://doi.org/10.1002/term.1905.
4. Leng, Shuilong, Stephen Iwanowycz, Fatma Saaoud, Junfeng Wang, Yuzhen Wang, Ismail Sergin, Babak Razani, and Daping Fan. "Ursolic Acid Enhances Macrophage Autophagy and Attenuates Atherogenesis." Journal of Lipid Research 57, no. 6 (June 1, 2016): 1006–16. https://doi.org/10.1194/jlr.M065888.
5. Pu, Lei, Jian Wu, Xingna Pan, Zongliu Hou, Jing Zhang, Wenmin Chen, Zhuhui Na, et al. "Determining the Optimal Protocol for Preparing an Acellular Scaffold of Tissue Engineered Small-Diameter Blood Vessels." Journal of Biomedical Materials Research Part B: Applied Biomaterials 106, no. 2 (2018): 619–31. https://doi.org/10.1002/jbm.b.33827.
6. Zhou Zhen, Peters Andrew M., Wang Shanzhi, Janda Alexandra, Chen Jiyuan, Zhou Ping, Arthur Erin, Kwartler Callie S., and Milewicz Dianna M. "Reversal of Aortic Enlargement Induced by Increased Biomechanical Forces Requires AT1R Inhibition in Conjunction With AT2R Activation." Arteriosclerosis, Thrombosis, and Vascular Biology 39, no. 3 (March 1, 2019): 459–66. https://doi.org/10.1161/ATVBAHA.118.312158.

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Bulk Reagent Ordering Information and Current Pricing at www.scytek.com

Description:	Catalog #	Volume
Hematoxylin Solution (5%)	HSV250	250 ml
	HSV500	500 ml
	HSV999	1000 ml
Ferric Chloride Solution (10%)	FCC125	125 ml
	FCC500	500 ml
	FCC999	1000 ml
Lugol's Iodine Solution	LIS125	125 ml
	LIS500	500 ml
	LIS999	1000 ml
Ferric Chloride (2%) Differentiating Solution	FCB125	125 ml
	FCB500	500 ml
	FCB999	1000 ml
Sodium Thiosulfate Solution (5%)	STB125	125 ml
	STB500	500 ml
	STB999	1000 ml
Acetic Acid Solution (3%)	AAG125	125 ml
	AAG500	500 ml
	AAG999	1000 ml
Acetic Acid Solution (1%)	AAE125	125 ml
	AAE250	250 ml
	AAE500	500 ml
	AAE999	1000 ml
Alcian Blue Solution, pH 2.5	ANC125	125 ml
	ANC250	250 ml
	ANC500	500 ml
	ANC999	1000 ml
Biebrich Scarlet – Acid Fuchsin solution	BSU125	125 ml
	BSU500	500 ml
	BSU999	1000 ml
Phosphotungstic Acid Solution (5%)	PGC250	250 ml
	PGC500	500 ml
	PGC999	1000 ml
Metanil Yellow Solution	MYQ125	125 ml
	MYQ500	500 ml
	MYQ999	1000 ml

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