



MyoTak™

Biocompatible Adhesive for use with SI-CTS100

INSTRUCTION MANUAL

Serial No. _____

030712

www.wpiinc.com

World Precision Instruments

CONTENTS

ABOUT THIS MANUAL 1

INTRODUCTION 2

 Notes and Warnings 2

 Parts List 2

 Unpacking 2

 Shipping 3

 Ordering 3

OPERATING INSTRUCTIONS 4

 Pre-coating 4

 Applying MyoTak to Pre-coated Mounts 5

 Applying MyoTak to Uncoated Microtweezers 7

MAINTENANCE 8

 Storage 8

TROUBLESHOOTING 9

WARRANTY 11

 Claims and Returns 11

 Repairs 11

Copyright © 2012 by World Precision Instruments, Inc. All rights reserved. No part of this publication may be reproduced or translated into any language, in any form, without prior written permission of World Precision Instruments, Inc.

ABOUT THIS MANUAL

The following symbols are used in this guide:



This symbol indicates a **CAUTION**. Cautions warn against actions that can cause damage to equipment. Please read these carefully.



This symbol indicates a **WARNING**. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and TIPS contain helpful information.



Fig. 1—MyoTak is normally used for mounting living cells to the SI-CTS Cell Tester, which is used for the study of single living cells, small multi-cellular preparations and single or larger skinned muscle strip preparations. Pre-coat (right) is included with each order of MyoTak.

INTRODUCTION

MyoTak is a biocompatible, cellular adhesive designed specifically for use with the **SI-CTS100** Cell Tester, a revolutionary new research tool to facilitate mechanical cellular investigation.

MyoTak provides a method of securely attaching a single living cell, such as a cardiac myocyte, to research tools without damage to the cell.

MyoTak is sold in packages with five vials of 20 μ L aliquots each. With daily testing, this supply will last five weeks. **MyoTak** has an added dye for easier viewing under a microscope.

Notes and Warnings



CAUTION: MyoTak MUST be stored in a freezer immediately upon receipt. If the gel is exposed to temperatures above 4°C, it polymerizes and quickly sets, making it unsuitable for its intended use. The pre-coat can be stored at room temperature.

Parts List

After unpacking, verify that there is no visible damage. Verify that all items are included:

- (5) 20 μ L vials of **MyoTak**
- (1) 100 μ L vials of **MyoTak** Pre-coat
- (1) Instruction Manual

Unpacking

Upon receipt of this package, make a thorough inspection of the contents and check for possible damage. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed damage should be reported at once to the carrier and an inspection requested. Please read the section entitled "Claims and Returns" on page 11 of this manual. Please contact WPI Customer Service if any parts are missing at 941.371.1003 or customerservice@wpiinc.com.

Returns: Do not return any goods to WPI without obtaining prior approval (RMA # required) and instructions from WPI's Returns Department. Goods returned (unauthorized) by collect freight may be refused. If a return shipment is necessary, use the original container, if possible. If the original container is not available, use a suitable substitute that is rigid and of adequate size. Wrap the instrument in paper or plastic surrounded with at least 100mm (four inches) of shock absorbing material. For further details, please read the section entitled "Claims and Returns" on page 11 of this manual.

Shipping

MyoTak must be express shipped on dry ice via FedEx priority overnight. It only ships on Mondays. Two shipping options are available:

- FedEx Collect: FedEx will bill you directly for the shipping costs. You must provide your FedEx account number when ordering.
- FedEx Prepaid: To add the shipping fees to an invoice, request a shipping and handling quote when ordering. The cost of shipping depends on the destination.

Ordering

Contact the WPI Sales team at 866.606.1974 or sales@wpiinc.com to schedule delivery of your next order of **MyoTak**.

OPERATING INSTRUCTIONS

The application of **MyoTak** and pre-coat to the cell mounting devices, like microtweezers and glass rods, is usually best performed on the same microscope that is used to observe the cells during the experiment. Using the same microscope for coating and experimentation reduces the amount of time needed to prepare the setup, and it increases the time available for experimentation.

This process requires the use of at least two cuvettes, or cuvette bottoms, depending on the design of the cuvette system. The first cuvette is used for pre-coating and **MyoTak** application to the cell mounts. The second cuvette is used to hold cells during the experiment.

Pre-coating

The pre-coat is applied to smooth surfaces, like glass rods, to roughen the surface and increase adhesion of the **MyoTak** glue to the surface. The pre-coat is an aggregate that is suspended in an aqueous solution, so it needs to be placed on a vortex before it is used. The pre-coat can be stored in its capped tube at room temperature for up to 2 months. Each tube contains enough pre-coat to perform more than 20 days of experiments when about 1.5 μ L of pre-coat is used each day.

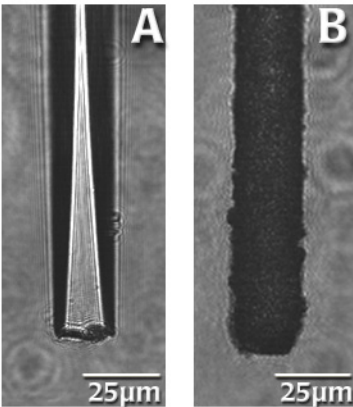


Fig. 2—The glass microrod is treated with precoat:

A) Uncoated glass microrod

B) Glass microrod with precoat after a 4 minute treatment and drying

Note the uniform layer of the precoat on the microrod B. (Photo by Dr. Ben Prosser, Ph.D)

To apply pre-coat to a glass rod or a similar smooth surface:

1. Position an empty cuvette on the stage of the microscope.
2. Place a small piece (~1 cm square) of a glass coverslip in the cuvette.

3. Vortex the microtube containing pre-coat for about 30 seconds.
4. Use a micropipette to place a 1.5µL drop of pre-coat in the center of the coverslip.



CAUTION: The following technique used to coat the cell mounts with pre-coat is critical.

5. Place the cell mounts in the drop of the pre-coat solution as described below and allow the mount to remain in the solution for 2 minutes.
 - For a more homogeneous layer of pre-coat on the mount, push the end of the mount into the side of the drop of pre-coat.
 - After the mount has been immersed in the drop of pre-coat for the 2 minutes, withdraw the mount from the drop along the same axis that was used to enter the drop (for example, from the side of the drop).

NOTE: If the mounts are lowered into and removed from the top of the drop of pre-coat, the pre-coat is usually distributed unevenly on the mount. An uneven pre-coat makes it difficult to attach cells to the mounts, even when **MyoTak** is used.

NOTE: If the mounts are left in the pre-coat longer than 2 minutes, the pre-coat forms clumps, which also make it difficult to attach cells to the mounts.

6. If the layer of pre-coat on the mounts is uniform and homogeneous, allow the pre-coat to dry for at least 30 minutes. The pre-coat can be dried for as long as 2 hours.
7. If the pre-coat is even and dry, the mounts are ready to be coated with the **MyoTak** glue. A good pre-coat layer should be a couple microns (2–3µm) thick.
8. Remove the small piece of coverslip holding the pre-coat from the cuvette.

Applying MyoTak to Pre-coated Mounts

Since **MyoTak** polymerizes at room temperature, it must be kept frozen until it is needed. Each tube of **MyoTak** contains enough glue to perform a week of experiments. Before using **MyoTak**, thaw a tube of the glue at a temperature between 0°C and 4°C, in either a refrigerator or an ice bucket.



CAUTION: Do not thaw **MyoTak** at room temperature or by warming it in any way.

If the capped tube of **MyoTak** is kept between 0°C and 4°C, the glue is viable for at least 5 days. Discard any tube of **MyoTak** that has been stored between 0°C and 4°C for longer than a week.

Proper drying is critical. If **MyoTak** is dried for too short of a period of time, the glue will dissociate when it is rehydrated and fail to stick to cells. If **MyoTak** is dried for too long of a period of time, the glue will be too stiff to conform to the shape of cells and fail to hold the cells securely.

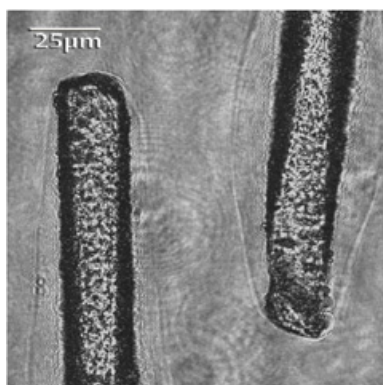


Fig. 3—Glass microrods are treated with pre-coat and MyoTak. The thickness of the MyoTak layer over the precoated microrods indicates that the MyoTak coating dried properly. (Photo by Dr. Ben Prosser, Ph.D)

1. Thaw a vial of **MyoTak** in the refrigerator or a bucket of ice.
2. Position an empty cuvette on the stage of the microscope.
3. Place a small, clean piece (~1cm square) of a glass coverslip in the empty cuvette on the stage of the microscope.
4. Use a clean micropipette to remove 1.5 μ L of **MyoTak** from the vial of glue that has been kept on ice.
5. Place the 1.5 μ L drop of **MyoTak** in the center of the new piece of coverslip.
6. Work quickly to put the pre-coated or uncoated mounts in the drop of **MyoTak**. Using the same technique used to pre-coat the mounts, push the mounts into the drop from the side.
7. Turn off the lamp of the microscope to keep the temperature lower. This allows the glue to polymerize more slowly and more completely.
8. Leave the mounts immersed in **MyoTak** for a total of 2 minutes.
9. To check the evenness of the **MyoTak** coating on the mounts during this 2 minute period, you may turn on the microscope light for a few seconds.
10. At the end of the 2 minute period, withdraw the mounts from the drop along the same axis that was used to enter the drop, from the side of the drop. Check for the evenness of the **MyoTak** layer. It should about 12 μ m thick.



CAUTION: If the **MyoTak** coating is too thick, the coated surface will stick to everything when the surface is placed into the aqueous media holding the cells.

11. Air dry the **MyoTak** coating for 4 minutes. During the drying period, it is normal for the **MyoTak** layer to dehydrate and appear thinner.

! **CAUTION:** If the **MyoTak** layer has not dried enough, the **MyoTak** layer will be too soft, and the cells will slide across the surface of the **MyoTak** layer. If the **MyoTak** layer has dried too long, the **MyoTak** layer will be too hard, and the cells will not stick to the glue.

12. While the **MyoTak** coating is drying, carefully remove the cuvette used during the application of the pre-coat and **MyoTak** from the stage of the microscope.
13. Place the second cuvette that contains the isolated cells stored in physiological buffer on the stage of the microscope.

NOTE: It is helpful to coat the bottom of the cuvette with a 100 μ M layer of BSA before filling it with buffer and cells.

14. Once the **MyoTak** coating is properly dried, carefully lower the **MyoTak** coated cell mounts (glass rods or microtweezers) into solution in the cuvette. This will re-hydrate the **MyoTak** coating and make it an effective adhesive for attaching the cells to the cell mounts. If the **MyoTak** coated mounts are kept in the physiological buffer as cells in the cuvette are manipulated and tested, the **MyoTak** glue remains effective for 2 to 3 hours.

Applying MyoTak to Uncoated Microtweezers

In some experimental protocols, the forces being applied or measured are small enough that pre-coat is not required to bind **MyoTak** to either microrods or tweezers. If glass microrods are used as the cell mounts, **MyoTak** can be applied directly to the microrods using the directions that are outlined in the previous section of this manual.

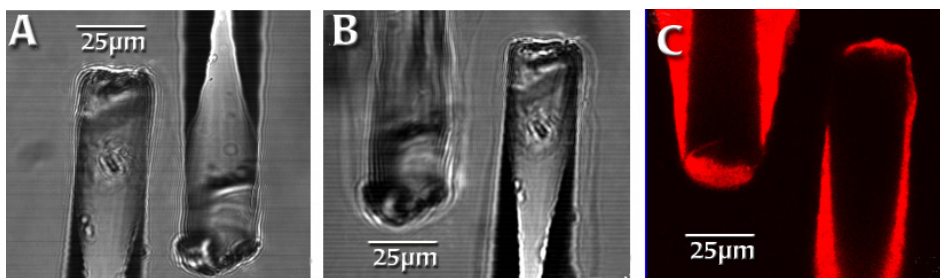


Fig. 4—The glass microrods are coated only with MyoTak (no precoat):

A) Uncoated glass microrods

B) Glass microrods coated only with a layer of MyoTak

C) Glass microrods coated only with a layer of MyoTak containing a fluorescent dye to demonstrate the thickness of the glue

(Photo by Dr. Ben Prosser, Ph.D)

NOTE: For information on the handling of cells using glass microrods, please refer to the WPI Cell Tester Manual.

If microtweezers are being used, they can be easily coated with **MyoTak** using the following directions:

1. Thaw a vial of **MyoTak** in the refrigerator or a bucket of ice.



CAUTION: Do not thaw **MyoTak** at room temperature or by warming it in any way.

2. Place the cuvette containing the isolated cells on the stage of the microscope.
3. Use a clean micropipette to remove 1.0 μ L of **MyoTak** from the tube of this glue that has been kept on ice.
4. While the tweezers are above the cuvette holding the cells, adjust the focus of the microscope to observe the tips of the tweezers.
5. Place the drop of **MyoTak** on the tips of the tweezers.
6. Gently open and close the tweezers to coat the inside and outside of the tweezer tips with **MyoTak**.
7. Open the tweezers and wait for 1 minute. Timing is critical. If the **MyoTak** is allowed to dry for longer than 1 minute, the tweezers and their push rod may stick together.
8. After the 1 minute drying period, lower the tips of the tweezers into the buffer in the cuvette. Position the tweezer tips in an area away from the cells.
9. When the drop of excess **MyoTak** disappears from the tweezers as the glue diffuses into the buffer, remove the tweezers from the buffer and let the **MyoTak** coated tweezers dry for 1 minutes.
10. Once the **MyoTak** coating is properly dried, carefully lower the **MyoTak**-coated tweezers into solution in the cuvette. This will rehydrate the **MyoTak** coating and make it an effective adhesive for holding the cells with the tweezers. If the **MyoTak** coating is kept in the physiological buffer as the cells in the cuvette are manipulated and tested, the **MyoTak** glue will remain effective for 2 to 3 hours.

NOTE: For information on the handling of cells using microtweezers, please refer to the WPI Cell Tester Manual.

MAINTENANCE

Storage

MyoTak MUST be stored in a freezer immediately upon receipt. If the gel is exposed to temperatures above 4°C, it polymerizes and quickly sets, making it unsuitable for its intended use.

TROUBLESHOOTING

Issue	Possible Cause	Solution
MyoTak does not stick to cell mounts	MyoTak thawed and stored at temperature above 4°C	Obtain a new tube of frozen MyoTak and thaw it in the refrigerator or in a bucket of ice.
	MyoTak thawed and kept at 4°C for longer than a week	
	Pre-coat not used on cell mount	Use precoat on the cell mount.
Cell slides around on MyoTak	Cell not pushed deeply enough into the MyoTak layer	Lower the MyoTak coated microrod onto the cell again, or close the MyoTak coated tweezer a slight amount around the cell again.
	MyoTak dried for too short a period of time before rehydration	Replace the microrods and coat a new set with pre-coat and MyoTak, or clean the tweezers and recoat.
Cell does not stick to MyoTak	MyoTak dried for too long a period of time before rehydration	Replace the microrods and coat a new set with pre-coat and MyoTak, or clean the tweezers and recoat.
MyoTak sticks to everything, including cuvette bottom	MyoTak coating is too thick when rehydrated or it was coated too long	Replace the microrods and coat a new set with pre-coat and MyoTak, or clean the tweezers and recoat.
Cells stick to cuvette bottom	Cuvette bottom not coated with layer of 100µM BSA	Clean the cuvette and coat it with layer of BSA before filling it with buffer and cells.

NOTE: If you have a problem/issue with that falls outside the definitions of this troubleshooting section, contact the WPI Technical Support team at 941.371.1003 or technicalsupport@wpiinc.com.



WARRANTY

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of 30 days* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*



World Precision Instruments, Inc.

USA

International Trade Center, 175 Sarasota Center Blvd., Sarasota FL 34240-9258
Tel: 941-371-1003 • Fax: 941-377-5428 • E-mail: sales@wpiinc.com

UK

1 Hunting Gate, Hitchin, Hertfordshire SG4 0TJ
Tel: 44 (0)1462 424700 • Fax: 44 (0)1462 424701 • E-mail: wpiuk@wpi-europe.com

Germany

Zossener Str. 55, 10961 Berlin
Tel: 030-6188845 • Fax: 030-6188670 • E-mail: wpide@wpi-europe.com

China & Hong Kong

WPI Shanghai Trading Co., Ltd.
Rm 20a, No8 Dong Fang Rd., Lu Jia Zui Financial District, Shanghai PRC
Tel: +86 688 85517 • E-mail: chinasales@china.wpiinc.com

Internet

www.wpiinc.com • store.wpiinc.com • www.wpichemistry.com
www.wpe-europe.com • www.wpiinc.cn