

DYE-TRAK™

PRECISION

IN REGIONAL

BLOOD FLOW

MEASUREMENT



Discount Prices !!
Molecular Probes 'FluoSpheres'
fluorescent microspheres

DYE-TRAK™ is a safe new non-radioactive method of measuring regional blood flow in experimental animals. Polystyrene microspheres of highly uniform diameter are precision dyed with one of several possible colors. Using an injection of DYE-TRAK spheres into a perfusion line or the left atrium, regional blood flow can be determined. The spheres are recovered from tissue and blood samples by digestion and subsequent microfiltration. The dyes are then recovered from the spheres within a known volume of a solvent and their concentrations determined by spectrophotometry. The separation of a composite absorbance spectra using the DYE-TRAK method is as accurate as the separation of energy spectrum using the radioactive microsphere technique. DYE-TRAK measurement of regional blood flow yields the same values as with radioactive microspheres, without the disadvantages related to radioactivity.

The Triton

Technology

Difference

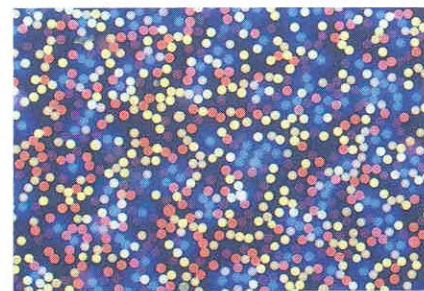
To create an ideal system for a broad range of regional blood flow measurements, Triton Technology combines its own expertise in physiological measurements with a unique system originally developed and validated by researchers at the University of Essen and Bayer AG. Available in a variety of colors, DYE-TRAK is the widely acclaimed successor to radioactive microsphere methodology. Triton's exacting quality standards assure you of a product designed and manufactured to perform consistently in your laboratory.

Scientific

Validation

Builds Confidence

DYE-TRAK components, software and methods have been thoroughly tested by independent investigators and results published in peer-reviewed journals. * The testing has included the stability of dye attachment,



completeness of dye recovery, and comparisons of DYE-TRAK with radioactive microsphere results. The studies demonstrated that regional blood flow can be accurately measured over a wide range of flow in different species using this cost-effective, non-radioactive technique.

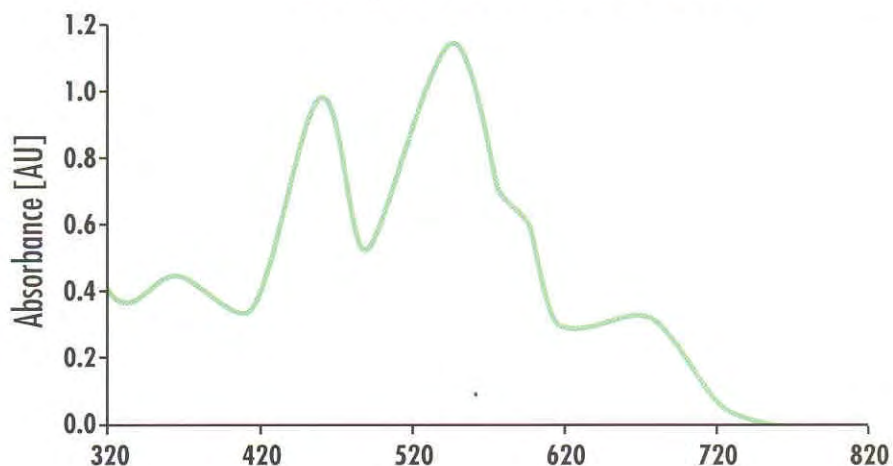
In the in-vitro studies, the DYE-TRAK method proved to be as accurate as the established radioactive microsphere technique.



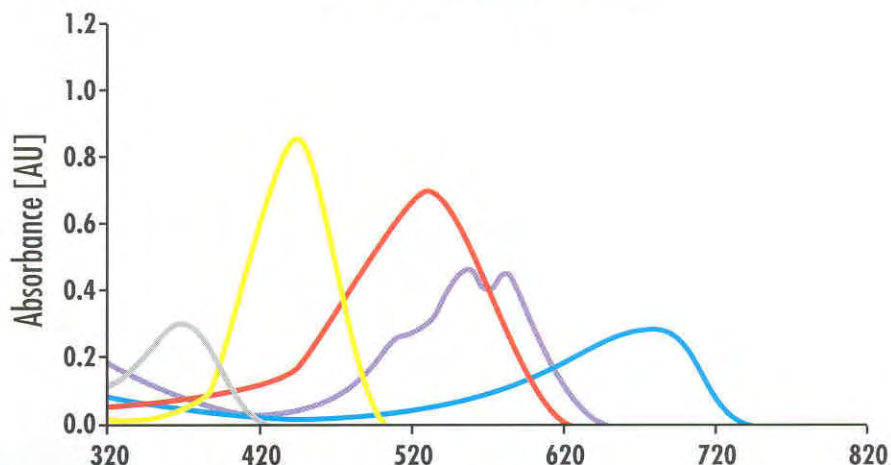
The size distribution of our precision spheres is highly uniform, and their density, 1.09 g/ml closely approximates that of erythrocytes. Leaching of the label dyes is virtually undetectable. The separation characteristics employing spectrophotometry and matrix inversion resolution of composite spectra reveal almost complete recovery of each dye and minimal interaction between peaks of a composite spectrum.

During in-vivo studies using intracoronary or left atrial administration, no significant difference occurred in regional myocardial blood flow measured by DYE-TRAK™ or radioactive microspheres.

Composite Spectrum



Single Spectra

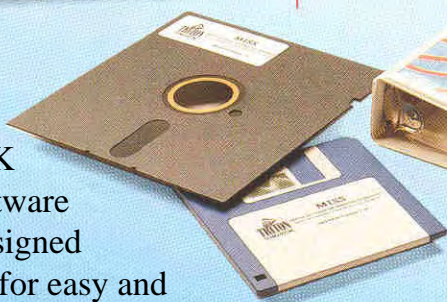


Simplified

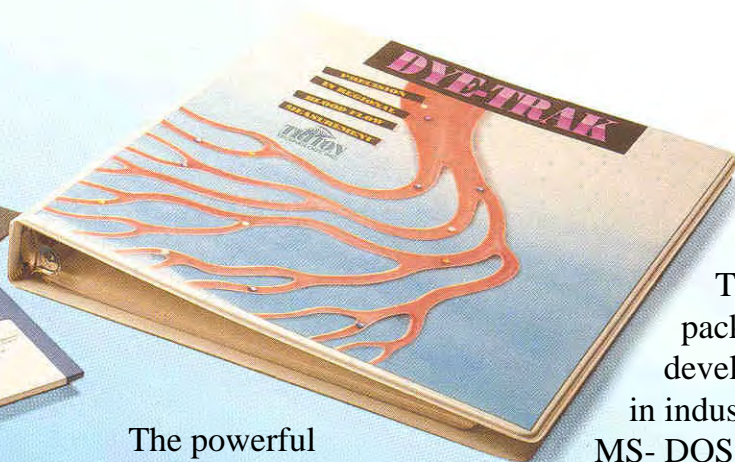
Quantification

Software

The DYE-TRAK analysis software has been designed specifically for easy and accurate quantification of dye concentration from spectrophotometric measurements.



The powerful matrix inversion program is accessible through an intuitive user-friendly interface.



This analysis package has been developed for use in industry standard MS- DOS computers.



Triton Technology,

Your Partner

In Research

Triton Technology is a dynamic company that has established a leadership role in physiological research instrumentation by delivering systems that set new standards of performance, operation and support. The Triton Technology team has been providing blood flow and organ measurement systems for over a decade to an elite worldwide clientele, including:

**Boehringer Ingelheim
Bristol Myers Squibb
Cedars Sinai Medical Center
Ciba Geigy
Duke University
Harvard University
Hoffman LaRoche
McNell Pharmaceuticals
Johns Hopkins
Eli Lilly Company
Loyola University
National Institutes of Health
Parke- Davis Pharmaceuticals
Pfizer
Smith- Kline & Beecham
University of California
University of Michigan
The Upjohn Company**

Triton Technology offers complete solutions and services. We can supply your requirements for precision microspheres, computer software and workstations. Comprehensive cost proposals and volume purchasing agreements will be presented upon request.

Ordering Information

For more details on DYE-TRAK™ including pricing and availability, please contact:



Triton Technology, Inc
3453 Ingraham St., #D
San Diego, CA 92109
(858) 272-1251
(858) 272-1451 FAX

Toll Free in the U.S.,
Canada: 800-872-1251

Dye-Trak is a registered trademark of Triton Technology, Inc.
MS-DOS is a registered trademark of Microsoft Corporation

U.S. and worldwide patents pending

*CIRCULATION, Vol.83, Num.3, 1991.
Kowallik et al.

Non-Radioactive Microspheres

for

Regional Blood Flow Determination

Radioactive microspheres have been the standard for measuring regional blood flow distribution in animal research models for many years. Radioactive microspheres have many negative health, safety and environmental issues associated with their use. Radioactive microspheres have to a large extent been replaced with the newer non-radioactive microspheres for regional blood flow measurement in animal models.

Triton Technology offers a variety of non-radioactive tracer microspheres for determination of regional blood flow distribution and particle deposition. Uniform-sized microspheres are made of stable polystyrene latex, cross-linked with DVB. These microspheres are marked with one of several unique families of markers and are used to measure regional blood flow at different time points during the course of an experiment. Typically blood flow measurements are made using 15um diameter microspheres. (10um microspheres are occasionally used for blood flow applications.). **Triton Technology** offers all the most popular microsphere types for measuring regional blood flow:

Dye-Trak® 'colored' microspheres are a safe, proven, non-radioactive method of measuring regional volume blood flow in experimental preparations. Polystyrene microspheres of highly uniform diameter are precision dyed with one of a number of possible colors (5 to 7, depending on the family). Using an injection of **Dye-Trak®** spheres into the left atrium, volume blood flow can be measured for any tissue bed in the animal model.

At the completion of an experiment, the microspheres are recovered from tissue and blood samples by tissue digestion and subsequent centrifugation or micro-filtration. The dyes are then eluted from the recovered microspheres with a known volume of a special solvent and the dye concentrations are determined using a normal UV/Visible spectrophotometer. The composite spectrum from a tissue sample is analyzed using **Triton Technology's** *free* Matrix Inversion software. The separation of a composite absorbance spectrum using the **Dye-Trak®** method is similar to the separation of energy spectra using the radioactive microsphere technique. **Dye-Trak®** measurement of regional blood flow yields blood flow values equivalent to those measured using radioactive microspheres, but without the health and safety issues associated with radioactive microspheres.

Dye-Trak® is available in two variations: the original 5-color palette and a newer **Dye-Trak II+** 7-color palette. While the original dye-Trak colors will always be available, we are recommending that new users start out using Dye-Trak VII+ colors for their experiments.

Dye-Trak 'F' and **FluoSpheres®** fluorescent microspheres offer high sensitivity measurement of regional blood flow determination, quantified by fluorescence spectrofluorometry. The fluorescent microspheres are available in eleven different colors, although they cannot all be used together. The fluorescent microspheres are used in the same way that the colored microspheres are used, but they require a fluorescence spectrophotometer (fluoremeter) for the analysis portion of the process. Some users find the larger solvent volumes associated with the fluorescent microspheres to be an advantage.

Triton Technology sells the Molecular Probes '**FluoSpheres**' at a discounted price. The Triton Technology Dye-Trak 'F' microspheres are available in four colors and are priced even lower than the **FluoSpheres**. Using the four Dye-Trak 'F' colors plus two colors of the **FluoSphere** colors makes it possible to measure six colors very economically and without the need to use mathematical spill-over correction due to the sharpness of the fluorescent peaks of these colors.

<http://www.physiology.com/Best%206%20Combo.htm>

The University of Washington 'Fluorescent Microsphere Resource Center' (FMRC) provides an excellent support website for fluorescent microspheres:

<http://fmrc.pulmcc.washington.edu/fmrc.shtml>

This website has an excellent manual on fluorescent microsphere use, as well a large searchable bibliography of papers published using both fluorescent and colored microspheres. On the FMRC website there is also a validation study on the Triton Technology Dye-Trak 'F' microspheres:

<http://fmrc.pulmcc.washington.edu/ResVal/Triton4.shtml>

Dye-Trak, **Dye-Trak VII+**, **Dye-Trak 'F'** micro spheres are manufactured by **Triton Technology**. **FluoSpheres®** are manufactured by **Molecular Probes** and sold under license of **Triton Technology** patents 5,230,343 and 5,253,649.