In vivo tumor targeting:
LumiLys 780 and MultiLys 780 T_2

1. Product description

1.1 Introduction

The use of tumor markers is intended to improve the accuracy of diagnostics for *in vivo* studies and for the treatment of cancers. These probes make possible the localization of a tumor and the study of its evolution during a treatment, for example.

In vivo tumor targeting products are fluorescent nanoparticles, designed for Near Infra-Red (NIR) *in vivo* imaging. Chromalys proposes two tumoral nanoprobes **LumiLys 780** and **MultiLys 780 T_2**, supplied functionalized with PEG (for a non-specific negative control), PEG-COOH or PEG-Avidin, to allow the easily conjugation of any targeting entity as proteins, peptides or antibodies specific to the studied pathology.

MultiLys 780 T_2 product is also designed for multimodal detection by MRI and computed tomography in addition to fluorescence imaging.

Our products resist to common fixative aldehyde solutions and therefore can be used before fixation.

1.2 Product format and storage

In vivo tumor targeting products are supplied as dried powders. Suspension (3 mg/mL), in glucose-water (5%) solution, has to be reconstituted by mixing the dried powder and the medium furnished, and then sonicated few minutes in an ultrasonic bath[1].

Dried nanoparticles can be preserved indefinitely at room temperature in the absence of light. However for Avidin function, a long time storage at -20°C is advised.

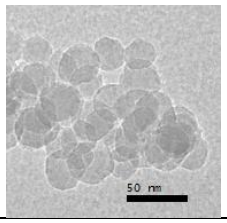
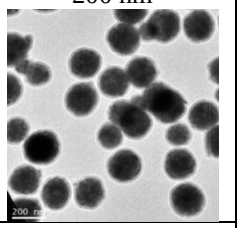
Nanoparticles in suspension should be used within 7 days and strongly sonicated in an ultrasonic bath just before using to ensure a good dispersion.

In vivo tumor targeting products contain no preservatives. Avoid any microbial contamination during use.

1.3 Quality control

In vivo tumor targeting products are tested to ensure lot-to-lot consistency. Size of the nanoparticles is examined by Transmission Electron Microscopy. Fluorescence quality is controlled by spectrophotometry.

2. Characteristics

Name	**LumiLys 780**	**MultiLys 780 T_2**
Available functions	-PEG (negative control) - PEG-COOH - PEG-Avidin	
Size	25 nm 	200 nm 
Shape	Spherical	
Composition	$Cy7@SiO_2$	$Dy_2O_2S@SiO_2$-Cy7
Fluorescence color	Near Infra Red	
Use	Fluorescence	Fluorescence, MRI, X-Ray (CT)
Excitation	750 nm	
Emission	780 nm	
Packaging	3 mg	
Nb treated mice	5	
Dilution medium	Glucose 5%	

[1] You can use very common ultrasonic bath usually used for vessels, mechanical pieces or jewelry cleaning.

3. How to use *in vivo* tumor targeting products

In vivo tumor targeting products are supplied as dried powders. Suspension in glucose solution (5%) has to be reconstituted by mixing the dried powder (3mg) and the medium furnished (1 ml water/glucose 5%), and then sonicated for 15 minutes in an ultrasonic bath. As-prepared suspension is thus at a concentration of 3 $mg.mL^{-1}$ and allows the injection of 5 mice (200 µl per mouse).

To ensure a good dispersion of the nanoparticles in the suspension, it is strongly recommended to sonicate the vial for 15 minutes prior to any uses.

4. Mouse injection with *in vivo* tumor targeting products

4.1. Reconstitution of the suspension

In vivo tumor targeting products are supplied as dried powders, the suspension as to be reconstituted as described in the section "3. How to use *in vivo* tumor targeting products".

4.2. Mouse treatment

For mouse weighing 20 to 30 g, 100 to 200 µL of suspension is usually used for IV injection. Depending of your need you can adjust this amount.

-Reconstitute the suspension (mother suspension) by mixing the dried powder and the furnished medium as previously described (see "reconstitution of the suspension").

- Warm the mouse tail to dilate the veins and enhance their visibility.

- Inject the product (typically 200 µL) via the lateral tail vein of the mouse.

4.3. In vivo observations

Follow the imaging protocol as recommended by the manufacturer of your imaging system.

For fluorescence imaging, select appropriate excitation and emission filters. *In vivo* tumor targeting products are exciting at 750 nm and emit at 780 nm.

For MRI, choose appropriate sequence. MultiLys 780 T_2 products produce good contrast in T_2 and T2* imaging.

- For applications involving vasculature imaging (angiography), begin imaging immediately after injection.
- For other applications, images acquisition over an extended time period after injection (for example 24 hours), is recommended.
- Prior to liver imaging a waiting period of 30–60 minutes is recommended. Liver imaging can be performed up to several weeks after injection.

Post-mortem fluorescence imaging can also be done on cytological sampling. *In vivo* tumor targeting products resist well to common fixative aldehyde solutions and to photo-bleaching.

4.4 Security

For laboratory and animal research use only. Not for human or animal therapeutic or diagnostic use. Make sure to carefully observe the legislation on animal experimentation.

Please contact us for any additional advice:
contact@chromalys.fr

5. Additional data

You may consult additional data about LumiLys and MultiLys product by uploading technical sheet for each product: click on the link below.

LumiLys 780
MultiLys 780 T_2