

Catalog Number: OV-1001

Product Name: OsteoVue 653

Product Description: OsteoVue 653 is a deep-red fluorescent bone seeking probe that has a dendritic molecular architecture with a squaraine rotaxane core scaffold and four peripheral iminodiacetate groups, which serve as the bone targeting units. OsteoVue 653 images areas of high bone turn over similarly to near infrared bisphosphonate probes [1] and may also image areas of microcalcifications. It does not stain decalcified bone, which is strong evidence that the bone targeting is primarily due to the Ca^{2+} chelation ability of the compound. Product contains 40 nmoles of OsteoVue 653 (2 x 20 nmole vials)

Properties: The structure of OsteoVue 653 is shown in **Fig. 1** and its photophysical properties are shown in **Fig. 2**. The multicolor mouse images in **Fig. 3** show that OsteoVue 653 (Probe 2) and the bisphosphonate probe OsteoSense 750 both target the same skeletal regions.

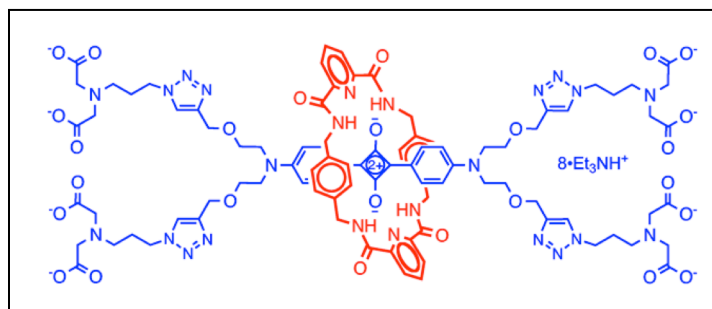


Fig. 1. Squaraine rotaxane based structure of OsteoVue 653.

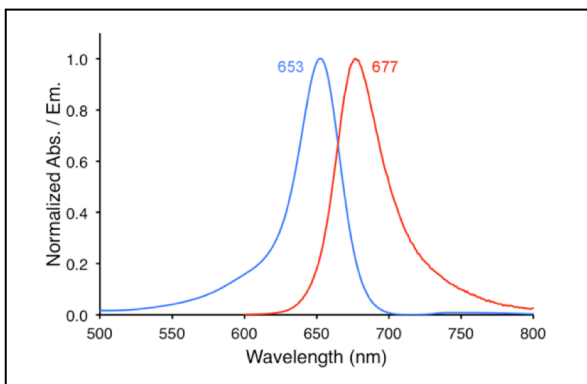


Fig. 2. OsteoVue 653 abs (---), em (—) in water. Abs max=653 nm; Em max=677 nm. Log ϵ =5.15 and ϕ =0.13

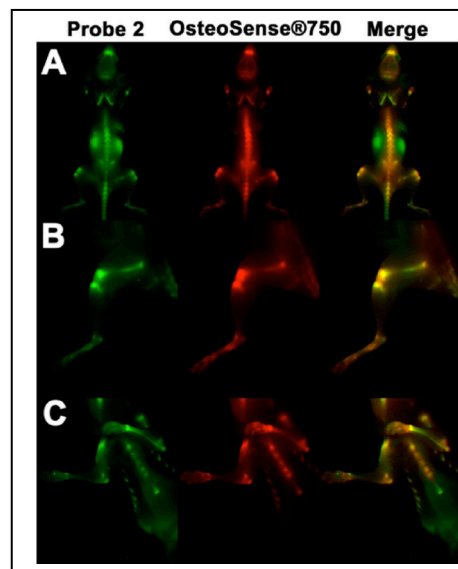


Fig. 3. Representative dorsal (A), leg (B), and chest (C) in vivo fluorescence images of skinless mice that have been treated with probe 2 (OsteoVue 653) (4 nmol) via an intraperitoneal injection and OsteoSense750 (2 nmol) via a retro-orbital injection. The images were acquired immediately after euthanization at 24 h pi of the probes and show fluorescence from probe 2 (ex: 630/10 nm, em: 700/20 nm), fluorescence from OsteoSense750 (ex: 730/10 nm, em: 790/20 nm), and a merged image (N = 3).

Storage/Stability: Protect from light at all times. Store at -20 °C prior to reconstitution. Store the reconstituted material at 4 °C and use within 1 week.

Directions for Use: Each vial contains 20 nmoles of OsteoVue 653 in a dried solid form. Reconstitute the 20 nmoles of blue solid in 0.5mL of water for a final concentration of 0.04nmol/μL. Make sure that all the blue solid is fully in solution. Recommended dose for a 25g mouse is 4 nmol injected intraperitoneally or intravenously via the tail vein.

Applications: Useful for preclinical *in vivo* studies of bone growth or bone remodeling using optical imaging or *in vivo* fluorescence guided surgery techniques. May enable *in vivo* detection of, measurement and monitoring of skeletal changes in a wide variety of disease states, including arthritis, osteoporosis and cancer metastases. Useful for various *in vitro* bone binding assays using microscopic or microarray detection systems.

Significant Advantages: (a) OsteoVue 653 provides a more stable signal in living mice over a 19 day period compared with OsteoSense750. (b) Its intense narrow emission band allows OsteoVue 653 to be used in multiplex imaging protocols that employ several fluorescent probes when imaging bone growth. (c) It is compatible with imaging systems equipped with standard Cy5 filter sets. (d) Bisphosphonate probes like OsteoSense 750 can induce apoptosis in osteoclasts [2-4] whereas OsteoVue 653 does not [5].

Precautions: The probe is processed through the kidneys and excreted through the bladder.

References:

- [1] Harmatys, KM, Cole, EL, Smith, BD (2013). In Vivo Imaging of Bone Using a Deep-Red Fluorescent Molecular Probe Bearing Multiple Iminodiacetate Groups. **Mol. Pharmaceutics**, 10: 4263-4271.
- [2] Russell RGG (2011). Bisphosphonates: the first 40 years. **Bone**, 49, 2-19
- [3] Baron R, Ferrari S, Russell RGG (2011) Denosumab and bisphosphonates: different mechanisms of action and effects. **Bone**, 48, 677-92.
- [4] Stern PH (2007). Antiresorptive agents and osteoclast apoptosis. **J. Cell Biochem.**, 101, 1087-1096.
- [5] Personal communication, Professor Bradley D Smith, University of Notre Dame.

Notes: OsteoVue 653 is intended for research purposes only and is not for human use. It must be used by or directly under the supervision of a technically qualified individual experienced in handling potentially hazardous materials. Please read the MSDS provided for this product.