Table 1 (ESI): Buffer and stock solutions

Buffer I: 0.02 M tetrabutylammonium acetate, pH 5.5

1.2 g tetrabutylammonium acetate was dissolved in 150 mL bidistilled water. The pH was adapted by use of acetic acid. By addition of water a volume of 200 mL was always kept constant. The buffer was stored at 4 °C.

Buffer II: 0.1 M Tris-HCl, pH 7- 7.5

6.0 g Tris-HCl was dissolved in 400 mL bidistilled water. The pH was adapted by use of 6 N HCl. By addition of water a volume of 500 mL was always kept constant.

Buffer III: Carbonate-bicarbonate buffer, pH 9.0

For this buffer two solutions were prepared: For 0.1 M sodium carbonate solution 2.1 g sodium carbonate (Merck, Darmstadt, Germany) was dissolved in 200 mL bidistilled water and for a 0.1 M sodium hydrogen carbonate solution 1.7 g sodium hydrogen carbonate (Merck, Darmstadt, Germany) was dissolved in 200 mL bidistilled water. For the buffer 10 mL of a 0.1 M Na_2CO_3-solution was mixed with 115 mL of a 0.1 M $NaHCO_3$ dilution. 375 mL bidistilled water was added as to get a final volume of 500 mL.

Buffer IV: Iodination buffer

The iodination buffer consisted of 100 mL of buffer II to which 0.01 mol NaI (Fluka, Buchs, Switzerland) was added and stored in the refrigerator. Aliquots of 250 µL were used for iodination only.

p-SCN-Bn-DOTA stock solution

2 mg *p*-SCN-Bn-DOTA (Macrocyclics, Dallas, USA) was dissolved in 0.5 mL buffer I. This stock solution should be controlled frequently or produced freshly because *p*-SCN-Bn-DOTA tends to hydrolyze. Aliquots of 125 µL (909 nmol) were only used for complexation.

Lanthanide stock solutions

3.664 mg $EuCl_3 \cdot 6\ H_2O$ (Sigma-Aldrich, Deisenhofen, Germany), 2.699 mg $HoCl_3 \cdot 6\ H_2O$ (Acros-Organics BVBA, Geel, Belgium), 3.734 mg $TbCl_3$ (Acros-Organics BVBA, Geel, Belgium) and 2.752 mg $TmCl_3$ (Acros-Organics BVBA, Geel, Belgium) were dissolved each in 1 mL of buffer I. 1 µL of these stock solutions is equivalent to 10 nmol europium, holmium, thulium and terbium, respectively.

Table 2 (ESI): Working conditions for ICP-MS instruments

ICP System Conditions used for pneumatic nebulisation	
Instrument	VG PQ3
Forward power	1370 W
Auxiliary gas flow	1.3 L min^{-1}
Coolant gas flow	13 L min^{-1}
Nebuliser (Meinhard) gas flow	0.9 L min^{-1}
Isotopes monitored	$^{153}Eu^{+}$, $^{140}Ce^{+}$
ELEMENT 2 (Thermo Fisher Scientific, Bremen, Germany) Conditions used for laser ablation	
Incident power	1,025 W
Cooling gas flow rate	16 L min^{-1}
Auxiliary gas flow rate	1.3 L min^{-1}
Make-up gas flow rate	1 L min^{-1}
Resolution setting	400, (4,000)
Isotopes monitored	$^{153}Eu^{+}$, $^{165}Ho^{+}$, $^{159}Tb^{+}$, $^{169}Tm^{+}$, $^{127}I^{+}$, ($^{13}C^{+}$)
Make-up gas flow rate, Ar	1 L min^{-1}
Carrier gas flow rate, He	1.6 L min^{-1}
Repetition rate	15 shots per second, Hz
Translation velocity	1 mm s^{-1}
Distance between line scans	1 mm

Table 3 (ESI): Electric scan conditions for the “Element 2” ICP-MS instrument

E-Scan			
Isotope	Tb159	Ho165	Tm169
Accurate mass	158.9248	164.9298	168.9337
Mass window	90	90	90
Mass range	158.686 – 159.163	164.682 – 165.177	168.680 – 169.187
Magnet mass	158.925	158.925	158.925
Settling time	0.001	0.001	0.001
Sample time	0.0035	0.0035	0.0035
Samples per peak	10	10	10
Segment duration	0.032	0.032	0.032
Search window	90	90	90
Integration window	80	80	80
Total time (per pass and res.) [h:min:sec]		00:01:14	

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