Supporting information

Smoothened titania particles to improve radionuclide separation and their application to the development of a novel [^{68}Ge]/[^{68}Ga] generator

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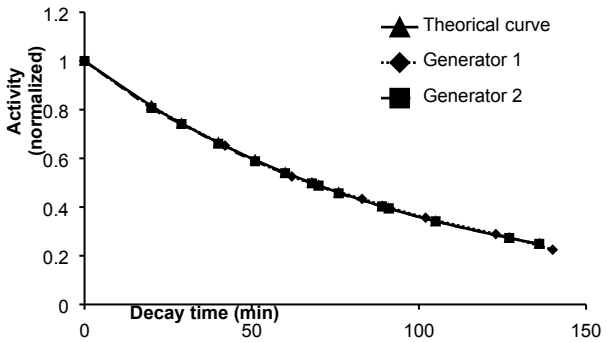

Sample	$t_{1/2}$ (min)
Theoretical	67.8
Generator 1	67.5 ± 0.4
Generator 2	67.3 ± 0.2

Fig. S1 Gallium-68 half-life determination.

Generator age (days)	Elution number	Percentage of recovery at Δt = 3h00 (%)	Percentage of recovery at Δt = 5h30 (%)
57	53	85.3	84.4
70	73	85.4	82.5
91	95	86.1	82.4
151	102	85.1	80.1
187	145	89.8	86.9
211	159	86.6	84.1
242	179	78.8	73.0

Table S1 Gallium-68 recovery at Δt = 3h00 and 5h30 in function of generator age.

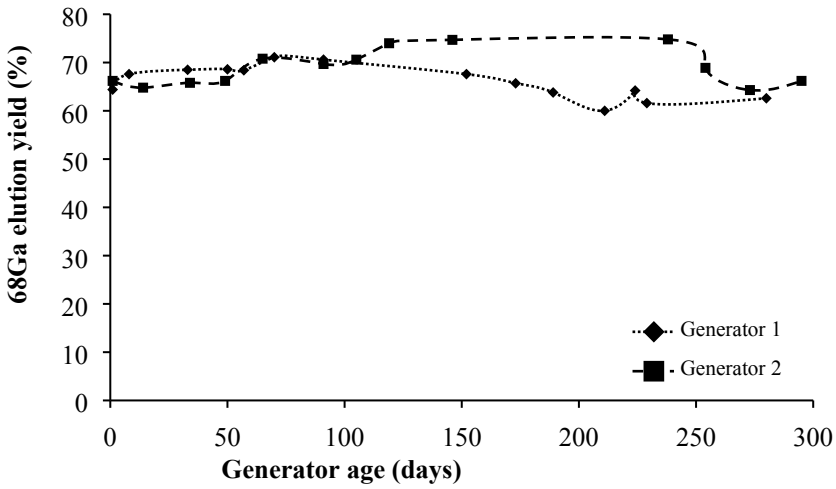

Fig. S2 Gallium-68 elution yield throughout generator life-span.

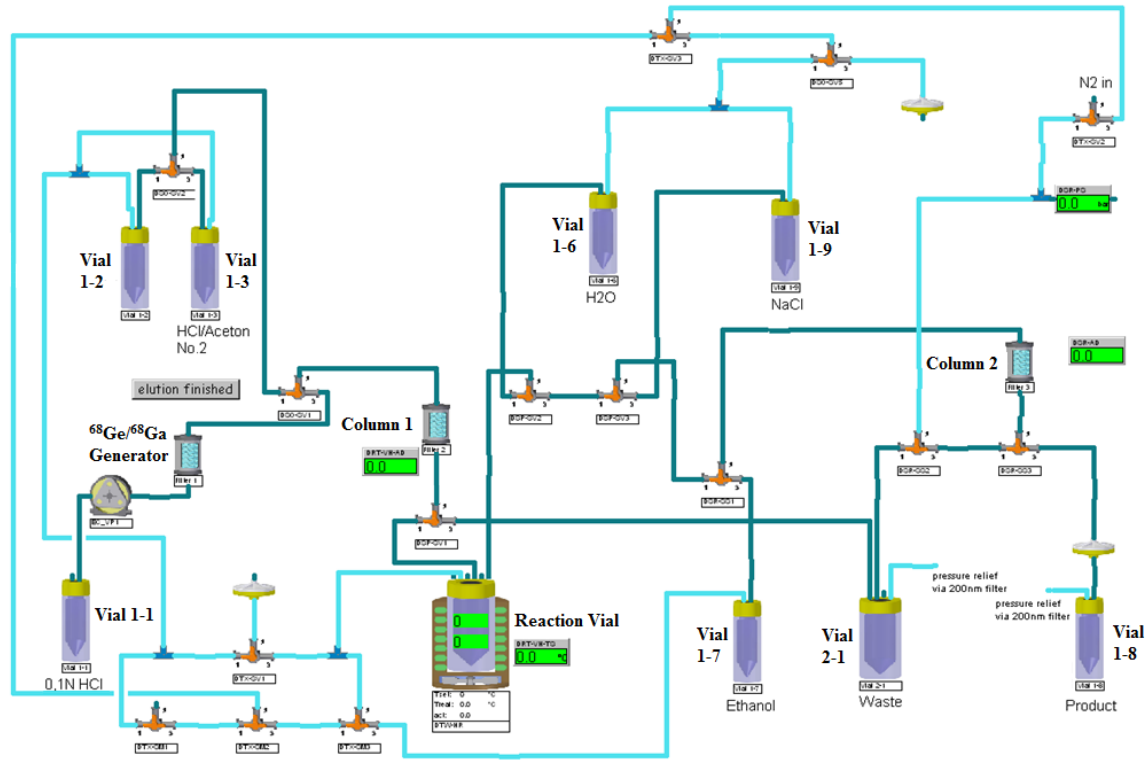

Fig. S3 Illustration of Modular-Lab (Eckert & Ziegler) device.

Position	Contents	Quantities
Column 1	Strata™-XC (Cation exchange)	-
	None (Fractionated elution)	-
Column 2	Sep-Pak® tC18 Light	-
Vial 1-1	0.1 M HCl	5 mL (Cation exchange) 1 mL (Fractionated elution)
Vial 1-2*	Empty vial	-
Vial 1-3*	HCl (0.05 M)/acetone (2/98)	800 µL
Vial 1-6	Water	3 mL
Vial 1-7	Ethanol/water	1 mL (50/50, v/v)
Vial 1-8	Empty vial	-
Vial 1-9	Water	10 mL
Reaction Vial (Cation exchange)	Acetate buffer	2 mL
	Precursor	24 nmol
Reaction Vial (Fractionated elution)	Acetate buffer	1 mL
	Sodium hydroxide (30%)	10 µL
	Precursor	24 nmol

* Vial used only for cation exchange method

Table S2 Reagents and materials for the device.

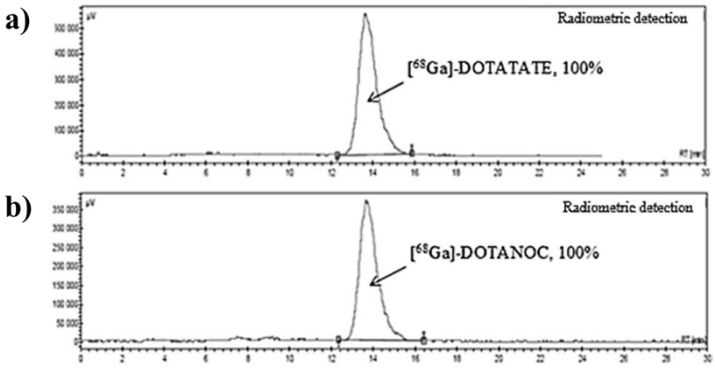

Fig. S4 Analytical HPLC analysis: (a) [^{68}Ga]-DOTATATE; (b) [^{68}Ga]-DOTANOC.

Generator age (days) (Generator 1)	Elution number	Percentage of incorporation (%)	Radiochemical yield (decay corrected, %)
41	40	89.2	67.6
92	97	99.4	88.8
154	107	98.9	79.9
191	150	97.5	83.5
216	162	98.1	77.3

Generator age (days) (Generator 2)	Elution number	Percentage of incorporation (%)	Radiochemical yield (decay corrected, %)
3	6	99.1	79.6
51	51	98.1	80.4
73	69	97.1	83.8
101	88	90.6	76.2
134	114	87.7	76.6
148	122	96.7	89.2
2.5 months without elution : Breaking point			
240	133	97.2	80.8
279	153	98.4	71.0
288	159	98.4	79.6

Table S3 [^{68}Ga]-DOTATATE radiolabeling for generator 1 and 2 respectively.