

Supporting Information to:

Noninvasive and Quantitative Monitoring of the Distributions and Kinetics of MicroRNA-targeting Molecules *In Vivo* by Positron Emission Tomography

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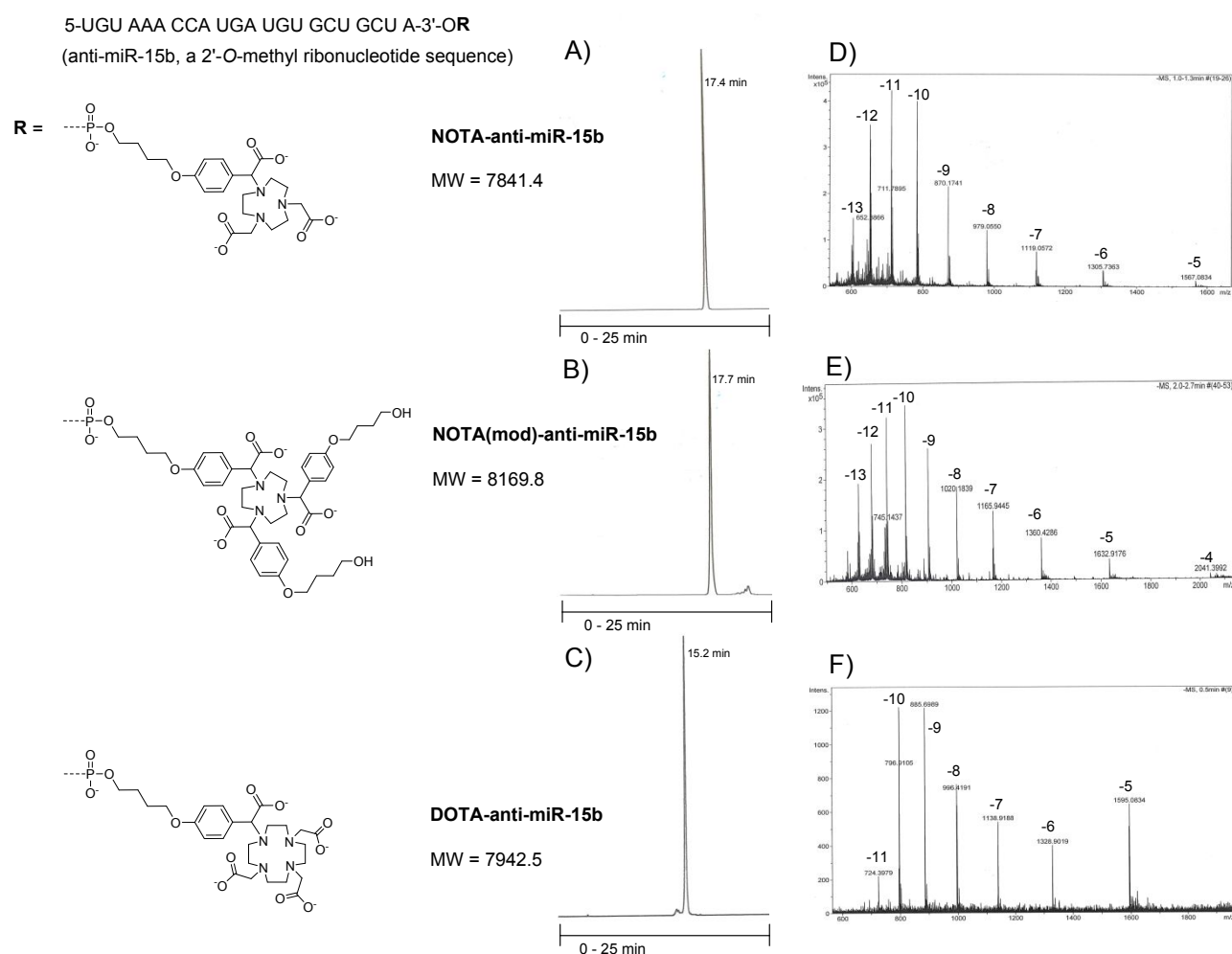


Figure S1. Representative RP HPLC chromatograms (A-C) and MS (ESI-TOF) spectra (D-F) of the oligonucleotides (**NOTA-**, **NOTA(mod)-** and **DOTA-anti-miR-15b**). RP HPLC conditions: An analytical R HPLC column (C18, 250 × 4.6 mm, 5 μm), detection at λ 260 nm, flow rate 1.0 mL min⁻¹, A gradient elution from 20 to 60% MeCN in 0.1 mol L⁻¹ aqueous triethyl ammonium acetate over 25 min. Observed masses for **NOTA-**

anti-miR-15b: $5 \times 1567.1 [(M-5H)/5]^{5-} + 5 \times 1.01 (H^+) = 7840.5$, for **NOTA(mod)-anti-miR-15b:** $4 \times 2041.4 [(M-4H)/4]^{4-} + 4 \times 1.01(H^+) = 8169.6$, for **DOTA-anti-miR-15b:** $5 \times 1595.1[(M-6H+K)/6]^{6-} - 39.1 (K^+) + 6 \times 1.01 (H^+) = 7942.4$.

Table S1. MS (ESI-TOF) data of the oligonucleotides

Oligonucleotide	NOTA- anti-miR-15b	NOTA(mod)- anti-miR-15b	DOTA- anti-miR-15b	NOTA- anti-miR-15b (2SBS)	NOTA- anti-miR-15b (scr)	NOTA- anti- miR-34	NOTA- T6
Observed molecular mass	7840.5	8169.6	7942.4*	7863.8	7840.6	7828.4	2291.5
Calculated molecular mass	7841.4	8169.8	7942.5*	7864.4	7841.4	7828.5	2291.7

Observed masses calculated from $[(M-nH)/n]^n$, * observed as potassium adducts, cf. the spectra in Figure S1

Table S2. Radioactivity concentration in rat blood and plasma at 60 min after intravenous injection

Tracer	Blood (SUV)	Blood cells (SUV)	Plasma (SUV)	Plasma/Blood ratio
[⁶⁸ Ga]Ga-NOTA-anti-miR-15b	0.34 ± 0.19	0.27±0.15	0.62 ± 0.32	1.82 ± 0.09
[⁶⁸ Ga]Ga-NOTA(mod)-anti-miR-15b	0.16 ± 0.04	0.12±0.03	0.29 ± 0.07	1.75 ± 0.02
[⁶⁸ Ga]Ga-DOTA-anti-miR-15b	0.78 ± 0.56	0.63±0.45	1.41 ± 1.01	1.81 ± 0.05
[⁶⁸ Ga]Ga-NOTA-anti-miR-15b(2SBS)	0.14 ± 0.02	0.10±0.01	0.23 ± 0.02	1.67 ± 0.18
[⁶⁸ Ga]Ga-NOTA- anti-miR-15b(scr)	0.14 ± 0.02	0.12±0.01	0.27 ± 0.02	1.86 ± 0.18
[⁶⁸ Ga]Ga-NOTA- anti-miR-34	0.23 ± 0.07	0.19±0.05	0.42 ± 0.12	1.83 ± 0.01
[⁶⁸ Ga]Ga-NOTA-T6	0.25 ± 0.11	0.19±0.08	0.45 ± 0.16	1.76 ± 0.15
[⁶⁸ Ga]Ga-NOTA	0.23 ± 0.05	0.18±0.04	0.42 ± 0.11	1.87 ± 0.09
Mean ± SD				1.80 ± 0.06

Plasma/blood ratio was used in correcting blood time-activity curve to plasma activity curve. Units used in table are standardized uptake values (SUV, g/mL).

Table S3. *Ex vivo* biodistribution of studied molecules in rats at 60 min after intravenous injection

Tissue	[⁶⁸ Ga]Ga- NOTA- anti-miR-15b	[⁶⁸ Ga]Ga- NOTA(mod)- anti-miR-15b ^a	[⁶⁸ Ga]Ga- DOTA- anti-miR-15b ^a	[⁶⁸ Ga]Ga- NOTA- anti-miR-15b(2SBS)	[⁶⁸ Ga]Ga- NOTA- anti-miR-15b(scr)	[⁶⁸ Ga]Ga- NOTA- anti-miR-34	[⁶⁸ Ga]Ga- NOTA- T6	[⁶⁸ Ga]Ga- NOTA
Adrenal glands	0.25±0.07	0.21±0.04	0.35±0.24	0.15±0.03	0.19±0.05	0.20±0.03	0.12±0.05	0.14±0.04
Bone	0.40±0.18	0.57±0.10	0.39±0.11	0.28±0.03	0.28±0.01	0.27±0.05	0.06±0.01	0.04±0.02
Bone marrow	0.67±0.05	1.36±0.18	0.73±0.27	0.37±0.07	0.72±0.07	0.35±0.06	0.09±0.02	0.06±0.02
Brain	0.02±0.00	0.01±0.00	0.03±0.03	0.01±0.00	0.01±0.00	0.01±0.00	0.02±0.01	0.02±0.01
BAT	0.21±0.05	0.25±0.03	0.23±0.12	0.13±0.03	0.14±0.02	0.14±0.04	0.09±0.03	0.08±0.01
Heart	0.18±0.06	0.21±0.02	0.27±0.16	0.08±0.01	0.12±0.01	0.12±0.03	0.10±0.03	0.08±0.02
Intestines ^b	0.22±0.03	0.35±0.06	0.25±0.12	0.10±0.01	0.19±0.02	0.15±0.03	3.12±2.03	0.50±0.30
Intestines ^c	0.38±0.11	0.38±0.01	0.32±0.13	0.17±0.01	0.29±0.03	0.24±0.06	3.22±1.47	0.29±0.20
Kidneys	178.20±102.96	100.26±6.68	83.13±23.37	63.01±30.15	141.05±31.11	150.25±21.68	5.48±2.06	3.97±1.23
Liver	1.72±0.71	3.38±0.71	2.50±0.63	0.84±0.19	1.09±0.02	0.94±0.15	1.11±0.42	0.56±0.07
Lungs	0.37±0.09	0.42±0.13	0.64±0.42	0.18±0.01	0.21±0.02	0.24±0.05	0.29±0.03	0.24±0.06
Muscle	0.07±0.01	0.07±0.02	0.08±0.04	0.05±0.01	0.04±0.00	0.05±0.01	0.04±0.01	0.04±0.01
Pancreas	0.33±0.07	0.36±0.03	0.27±0.06	0.15±0.02	0.37±0.08	0.19±0.04	0.34±0.11	0.10±0.02
Salivary glands	0.43±0.09	0.48±0.14	0.35±0.16	0.19±0.02	0.57±0.05	0.24±0.05	0.09±0.03	0.10±0.02
Skin	0.29±0.09	0.31±0.08	0.24±0.06	0.34±0.09	0.24±0.03	0.36±0.11	0.18±0.05	0.14±0.04
Spleen	0.86±0.57	1.85±0.69	1.49±0.63	0.38±0.08	0.33±0.04	0.38±0.11	1.59±0.68	0.26±0.09
Urine	10.94±2.84	19.08±11.67	15.66±8.51	18.10±7.64	40.13±15.83	22.12±4.11	146.82±58.74	208.51±47.32
WAT	0.06±0.02	0.07±0.04	0.05±0.02	0.04±0.01	0.04±0.00	0.04±0.01	0.50±0.38	0.04±0.02

Units used in table are standardized uptake values (SUV, mean±SD, n=4 except for [⁶⁸Ga]Ga-NOTA(mod)-anti-miR-15b n=3). ^a includes two females, all other rats are males; ^b with content; ^c without content; BAT, brown adipose tissue; WAT, white adipose tissue.