

Pilot experience of [¹⁶¹Tb]Tb-PSMA-617 RLT in mCRPC patients after conventional PSMA RLT within a prospective registry

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Table S1: Physical properties of the nuclides ^{161}Tb and ^{177}Lu based on data from the *International Commission on Radiological Protection (ICRP)* [1].

Parameter	^{161}Tb	^{177}Lu
Physical half-life [days]	6.906	6.647
Decay mode	β^- (100%)	β^- (100%)
Stable daughter nuclide	^{161}Dy	^{177}Hf
Mean β^- energy [keV]	154.3	133.3
Total electron energy per decay [keV]	202.5	147.9
Conversion electron energy per decay [keV]	39.28	13.52
Conversion electron spectrum [keV] (weighted average mean)	3.3 – 98.3 (28)	6.2 – 206.3 (87)
Auger electron energy per decay [keV]	8.94	1.13
Auger electron spectrum [keV] (weighted mean)	0.018 – 50.9 (0.8)	0.01 – 61.7 (1)
Imaging relevant γ emissions [keV] ([%] abundance)	75 (10.2%)	208 (10.4%)/ 113 (6.4%)

Table S2: Grading system of fatigue and xerostomia after the of the U.S. Department of Health and Human Services (National Institutes of Health – National Cancer Institute).

CTCAE Term	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Fatigue	Fatigue relieved by rest.	Fatigue not relieved by rest; limiting instrumental activities of daily living.	Fatigue not relieved by rest; limiting self care activities of daily living.	X	X
Definition: A disorder characterized by a state of generalized weakness with a pronounced inability to summon sufficient energy to accomplish daily activities.					
Xerostomia	Symptomatic (e.g., dry or thick saliva) without significant dietary alteration.	Moderate symptoms; oral intake alterations (e.g., copious water, other lubricants, diet limited to purees and/or soft, moist foods).	Inability to adequately aliment orally; tube feeding or TPN indicated.	X	X
Definition: A disorder characterized by reduced salivary flow in the oral cavity.					

Table S3: Patient individual Δ PSA value, Δ TLP value and response category after treatment with [¹⁶¹Tb]Tb-PSMA-617.

Patient	Subgroup (I/II/III)	Δ PSA [%]	Δ TLP [%]	Response Category (Δ PSA based)	Response Category (Δ TLP based)
P1	I	-40.2	-54.5	SD	PR
P2	I	-89.9	-86.4	PR	PR
P3	I	-55.3	-59.8	PR	PR
P4	I	-99.0	-71.6	PR	PR
P5	I	-46.7	-57.9	SD	PR
P6	I	-58.8	-62.0	PR	PR
P7	I	-92.2	-79.4	PR	PR
P8	I	-77.3	47.0	PR	PD
P9	I	32.3	85.8	PD	PD
P10	I	-0.9	4.66	SD	SD
P11	II	-26.8	-26.2	SD	SD
P12	II	50.5	-18.2	PD	SD
P13	II	-53.4	-90.8	PR	PR
P14	III	-18.6	-14.4	SD	SD
P15	III	68.0	-8.7	PD	SD
P16	III	48.6	37.4	PD	PD
P17	III	44.4	-1.4	PD	SD
P18	III	-27.8	-10.7	SD	SD

I: progression after medication break from [¹⁷⁷Lu]Lu-PSMA-617 RLT; II: insufficient response to initial [¹⁷⁷Lu]Lu-PSMA-617 RLT and III: insufficient response to initial [¹⁷⁷Lu]Lu-PSMA-617/[²²⁵Ac]Ac-PSMA-617 RLT

Table S4: Course of CTCAE gradings of the individual patients during PSMA RLT.

Before start of initial PSMA RLT							
Patient	Xerostomie (CTCAE)	Fatigue (CTCAE)	Nausea (CTCAE)	Leucopenia (CTCAE)	Thrombo-cytopenia (CTCAE)	Anemia (CTCAE)	GFR (CTCAE)
P1	0	1	0	0	0	0	0
P2	0	1	0	0	1	1	2
P3	0	0	0	1	0	1	0
P4	0	1	0	0	0	2	2
P5	1	0	0	0	0	1	1
P6	0	0	0	0	0	0	2
P7	0	1	0	0	0	1	0
P8	0	1	0	0	0	2	2
P9	0	1	0	0	0	1	1
P10	0	1	0	0	0	1	2
P11	0	1	0	0	0	3	1
P12	0	0	0	0	0	1	1
P13	0	0	0	0	0	2	1
P14	0	0	0	0	0	1	1
P15	0	0	0	0	0	1	2
P16	0	1	0	0	0	1	1
P17	2	2	0	0	1	3	0
P18	0	1	0	1	0	1	2
Before start of [¹⁶¹ Tb]Tb-PSMA-617 RLT							
Patient	Xerostomie (CTCAE)	Fatigue (CTCAE)	Nausea (CTCAE)	Leucopenia (CTCAE)	Thrombo-cytopenia (CTCAE)	Anemia (CTCAE)	GFR (CTCAE)
P1	0	1	0	0	0	0	0
P2	1	1	0	0	0	1	2
P3	2	1	0	1	0	1	1
P4	0	0	0	0	0	2	2
P5	0	1	0	1	0	1	2
P6	1	0	0	1	1	1	2
P7	0	0	0	0	0	1	1
P8	0	0	0	0	1	2	3
P9	1	1	0	0	0	1	2
P10	0	2	0	0	0	1	2
P11	0	1	0	1	1	2	1
P12	0	0	0	0	0	2	1
P13	1	2	0	0	0	2	2
P14	2	1	0	0	0	1	2
P15	2	2	0	0	0	2	2
P16	1	1	0	0	0	2	2
P17	1	2	0	2	1	2	0
P18	0	1	0	1	0	2	2
After [¹⁶¹ Tb]Tb-PSMA-617 RLT							
Patient	Xerostomie (CTCAE)	Fatigue (CTCAE)	Nausea (CTCAE)	Leucopenia (CTCAE)	Thrombo-cytopenia (CTCAE)	Anemia (CTCAE)	GFR (CTCAE)
P1	0	1	0	0	0	0	1
P2	0	1	0	0	0	1	2
P3	2	1	0	1	1	2	2
P4	1	2	0	0	0	2	3
P5	0	2	0	1	1	2	2
P6	1	0	0	0	1	1	2

P7	0	1	0	0	0	1	0
P8	0	0	0	0	1	2	2
P9	1	1	0	0	0	3	3
P10	0	2	0	0	0	2	2
P11	1	2	0	0	3	3	1
P12	0	1	0	0	0	2	2
P13	1	2	0	0	0	4	2
P14	2	1	0	0	1	2	3
P15	2	2	0	0	1	2	3
P16	2	1	0	1	0	4	2
P17	2	2	1	1	3	2	0
P18	1	1	0	1	0	2	2

References

1. Eckerman K, Endo A. ICRP Publication 107. Nuclear decay data for dosimetric calculations. Ann ICRP. 2008; 38: 7–96.