

**Supplementary Table S1:** Ongoing Phase 1 clinical trials with radionuclides for the treatment of PCas (source: clinicaltrials.gov ; last accession : Novembre 15<sup>th</sup> 2022). PCa: Prostate Cancer, mHSPC: metastatic hormone sensitive Prostate Cancer, mCRPC: metastatic-castration resistant Prostate Cancer, ADT: androgen deprivation therapy, ARDT: Androgen receptor directed therapy, EBRT: External beam radiation therapy, SBRT: Stereotactic Body Radiation Therapy, BCR: biochemical recurrence, cN+: clinical positive lymph node.

NCT number	Drug combined	Name of Study	Disease stage	Intervention	Phase	Location
NCT05079698	SBRT	21-158	Oligo mHSPC	<sup>177</sup> Lu-PSMA-617 + Stereotactic Body Radiotherapy	Phase 1	United States
NCT05162573	EBRT	PROQUIRE-1	cN+ PCa	<sup>177</sup> Lu-PSMA-617 + EBRT	Phase 1	Netherlands
NCT04071236	Avelumab Peposertib	NCI-2019-05620	mCRPC	[ <sup>223</sup> Ra]RaCl <sub>2</sub> <i>vs</i> [ <sup>223</sup> Ra]RaCl <sub>2</sub> + Peposertib <i>vs</i> [ <sup>223</sup> Ra]RaCl <sub>2</sub> + Peposertib + Avelumab	Phase 1/2	United States
NCT04597411		AcTION	mHSPC mCRPC	[ <sup>225</sup> Ac]Ac-PSMA-617	Phase 1	South Africa