TABLE 1:
TRP targeting molecules

Category	Description	Example assets
Small molecule	• Lower affinity for target and greater possibility of off-target effects • Easy to manufacture • Good tumor penetration • Effective despite lower radionuclide to target ratios • Rapid pharmacokinetics accommodates a broader range of radionuclides • Generally easiest to penetrate the blood brain barrier (BBB)	• [68Ga] FAPI-46 PET • Detectnet • Technetium Tc-99m tilmanocept
Peptide	• High affinity for target • Good tumor penetration • Flexible design, highly tunable pharmacokinetics • Typically require transport mechanisms to cross BBB	• Pluvicto • Lutathera • RYZ101
(Mini) antibody, antibody fragments	• High affinity for target • Potential for multiple chelators (and radionuclides) per targeting agent • Slower pharmacokinetics can impact radionuclide considerations • Typically require transport mechanisms to cross BBB	• TLX591 • Iomab-B

TABLE 2:
Radionuclides

Particle type	Description	Example radionuclide
Alpha (α)	• Greater potency; more likely to cause double-stranded DNA breaks • Shorter penetration distance, potentially requiring more homogeneous antigen expression • Used almost exclusively in therapeutics	• Actinium-225 (Ac-225)
Beta (β)	• Moderate penetration ability and ionization power; more likely to cause single-stranded DNA breaks • Larger penetration distance, permitting more heterogeneous antigen expression • Used primarily in therapeutics	• Lutetium-177 (Lu-177)
Gamma (γ)	• High affinity for target • Potential for multiple chelators (and radionuclides) per targeting agent • Slower pharmacokinetics can impact radionuclide considerations • Typically require transport mechanisms to cross BBB	• TLX591 • Iomab-B