A novel precursor tris-tert-Bu-(Z)-Ser-DO3A was synthesized and its potential application in molecular imaging was explored. The precursor contains orthogonally protected amino and carboxylate groups which can be selectively deprotected in order to couple different responsive moieties such as, mAb, Biotin, CPP, PNA etc. Using this strategy, a variety of contrast agents can be developed. The focus of the talk will be on the development of potential neuroanatomical tracer and the targeted marker synthesized from the described precursor.