The use of radioactive ion beams in nuclear physics experiments has increased rapidly in recent years. A variety of short-lived nuclear species and beam energies are available. The study of fusion with such nuclei is an important area of research. Even with the low intensity at present, compared to stable beams, it provides opportunities to explore coupling to the continuum in loosely bound nuclei. With medium-mass neutron-rich radioactive nuclei, the influence of neutron excess on fusion dynamics and compound nucleus survival can be studied. This can improve our understanding on how to synthesize new heavy elements.

Fluorine-17 has a loosely bound proton outside of the closed shell oxygen-16. Fusion, elastic scattering and breakup of $^{17}\text{F}$ on $^{208}\text{Pb}$ has been measured at energies around the Coulomb barrier. A strong proton stripping breakup was observed but no sub-barrier fusion enhancement was found[1]. A comparison among these measurements and with stable $^{16}\text{O}$ and $^{19}\text{F}$ beams on $^{208}\text{Pb}$ measurements will be presented.

Fusion induced by medium-mass neutron-rich radioactive nuclei, $^{38}\text{S}$, $^{46}\text{Ar}$, $^{132,134}\text{Sn}$, and $^{134}\text{Te}$ has been measured. Enhanced sub-barrier fusion cross sections were observed in these measurements. However, in most of the cases the enhancement is due to the lowering of the barrier by the extra number of neutrons. Results from these experiments and future plans[2] will be discussed.

References
