The aim of the research is to synthesize new dinucleating ligands that would support early transition metal-metal multiple bonds that could activate small molecules. Notable outcomes are (1) Ta complexes of the bicyclic guanidinate hpp\(^-\), (2) alkylated bicyclic guanidinates, (3) lithiated N-heterobicyclic dicarbenes via deprotonation of bis(formamidinium) dications, and (4) the first metal-metal multiply-bonded complex with an NHC ligand, via CO substitution.

\[
\text{Cp}^*\text{Ta(hpp)}\text{Cl}_3
\]

\[
\text{Cp}''\text{Ta}^{\text{V}}(\text{hpp})\text{Cl}_2
\]

\[
\text{Cp}_2\text{Mo}_2(\text{CO})_3(\text{NHC})
\]

\[
\text{Ta(hpp)}\text{Cl}_4
\]