

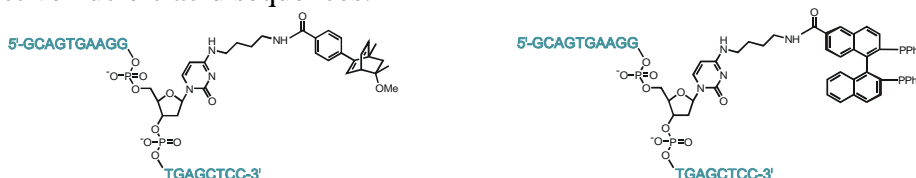
Preparation of transition metal-modified DNA and RNA for the *in vitro* selection of hybrid catalysts

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Protein engineering has led to the development of artificial metalloenzymes having novel chemical properties. E.g., engineered proteins carrying transition metals like Rh or Ru are able to perform catalytic hydrogenations.^{1,2} In the field of nucleic acids however, metal ions are generally considered only from the structural point of view. With the rapid discovery of new nucleic acid enzymes (ribozymes and DNAzymes), it is becoming clear that nucleic acid are not only the carriers of genetic information but also have interesting catalytic abilities. Strongly beneficial for these discoveries are the *in vitro* selection (SELEX) and evolution techniques which have led to the isolation of sequences with the desired catalytic activity starting from combinatorial libraries of nucleic acids.^{3,4}

This contribution deals with the preparation of modified RNA and DNA to be used in the *in vitro* selection of novel nucleic acid enzymes using transition metal ions as active site components. For the two selected target transformations, namely the 1,4-conjugate addition of boronic acid to enones, and the allylic amination, conditions have been found which are compatible with the presence of nucleic acids in the reaction mixture. DNA sequences bearing suitable ligands for transition metal catalyzed reactions such as bisphosphines and conformationally constrained dienes have been prepared, and studies about complex formation with Rh(I) and Ir(I) will be reported. Finally enzymatically modified RNAs carrying at their 5'-end one of the reaction substrates have been obtained, a step which will allow for the selection of the active nucleic acid sequences.



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