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## Editorial

**Modern applications of transition metal catalysis in heterocycle synthesis**

The advent of transition metal catalysis has revolutionized the way synthetic chemists construct organic molecules. Reactions and catalysts that were once considered exotic are now firmly established as indispensable synthetic tools. Compared to classical syntheses, transition metal catalyzed routes often allow alternative disconnections to be executed and different starting materials to be employed. Given the presence of heterocycles in almost all branches of organic chemistry, and in particular their importance as medicinal agents, agrochemicals, dyes and materials, it is not surprising that synthetic heterocyclic chemistry has been transformed by transition metal catalysis. The challenges of developing and applying new transition metal catalyzed processes to heterocyclic systems, which often include the presence of strongly coordinating atoms and functional groups, and substrates that display significant variations in reactivity relative to the simple carbocyclic systems, has resulted in the area becoming a popular test-ground in which to develop new methods.

Classic heterocycle syntheses are dominated by acid- and base-promoted condensation reactions. Despite the success of these approaches, the reliance on a small number of key bond-forming reactions limits the available pool of starting materials. This is one area where the impact of transition metal catalysis is clearly visible, with new syntheses, employing diverse starting materials, continually appearing. The synthesis of heterocyclic compounds is only one area to benefit from transition metal catalysis; the high levels of chemo-, regio-, and stereo-selectivity possible using transition metal catalysis, combined with the good functional group tolerance of the

processes, has resulted in the controlled functionalization of intact heterocycles becoming a second rewarding area of exploration.

The aim of this Tetrahedron Symposium-in-Print is to bring together a collection of articles that highlight the diverse and exciting range of applications of transition metal catalysis to heterocyclic chemistry. The Symposium-in-Print features contributions from both academic and industrial laboratories, and includes applications to the synthesis of heterocyclic systems as well as the functionalization of intact heterocycle cores. Heterocyclic building blocks, medicinal agents and natural products are all featured as the focal point of these investigations, and methods employing Pd, Au, Cu, Rh, and Ru catalysis are all described. I hope this issue conveys the vibrancy and impact of this important field, and serves to generate ideas to push the discipline forward.

Finally, I would like to thank the authors and reviewers for their contributions to this issue, Professor Richard Taylor, and Jane Quinn at Elsevier, for their help in putting together this Symposium-in-Print, and Robert Snell for his assistance with the cover graphic.

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