

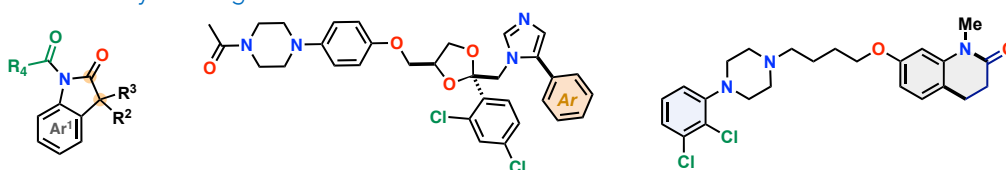
# Catalytic C–H Bond Functionalizations to Improve Molecular Diversity, Materials and Catalysts

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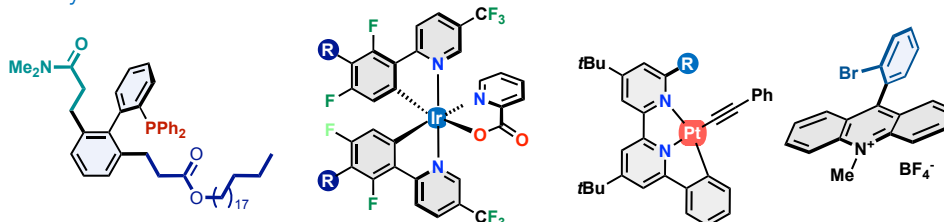
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Over the past several decades, advances in catalytic C–H bond functionalization techniques have revolutionized the synthesis of complex molecules.<sup>[1]</sup> However, achieving precise regioselectivity during C–H bond modification remains a significant challenge. Our research aims to address this by developing methods to control and switch regioselectivity while minimizing environmental impact. In our approach, we streamline the process by employing efficient catalytic systems and minimizing the use of additives. Notably, we utilize inherent directing groups within the molecules themselves, thus eliminating the need for additional steps to install or remove directing group. Our focus is largely on the meticulous design of new ligands, catalysts, and optimized reaction conditions to achieve catalyst-driven regiocontrol. This lecture will delve into our most recent contributions, showcasing how these new regioselective C–H bond functionalization techniques can revolutionize the synthesis of heteroaromatic drugs,<sup>[2]</sup> luminescent cyclometalated metal complexes,<sup>[3]</sup> phosphines,<sup>[4]</sup> and acridinium-based photoredox catalysts.<sup>[5]</sup>

## ❖ Heterocyclic Drugs



## ❖ Catalysts and Materials



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