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Titolo del Seminario: Mechanistic investigations on Cp*Co(III)-catalyzed "borrowing hydrogen" reactions: the already rich mechanistic landscape is further expanding!

Abstract: The "borrowing hydrogen" approach elegantly expands the scope of catalysis at the service of organic synthesis. On the other hand, interest in replacing precious metals with more abundant metals (3d or "base" metals) is growing. In our groups, various substrates (anilines,¹ aromatic ketones,² oxindoles,³ *etc.*) could be alkylated by secondary alcohols via a borrowing hydrogen strategy under the catalytic action of Cp*Co^{III} compounds (Figure 1).

The observed higher activity (in specific cases) for the coordinatively saturated **3** led to detailed mechanistic studies by a combined experimental-computational approach, revealing an unprecedented pathway for the dehydrogenative activation of the secondary alcohol. The key feature is the transfer of the β -H atom as a proton to an internal (coordinated) or external base, rather than as a hydride ligand to the metal (Figure 2).⁴ This unsuspected new pathway may also be operational for previously published processes catalyzed by other metals.