C—H to C—N Cross-coupling of Sulfonamides with Olefins

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Due to the ubiquity of C—N bonds in natural products and pharmaceuticals, the cross-coupling of nitrogen functionality with hydrocarbons under fragment coupling conditions (1 equivalent) stands to significantly impact chemical synthesis. Whereas significant progress has been made in cross-couplings of amines with aryl halides to form C(sp^2)—N bonds, the development of analogous C(sp^3)—N coupling reactions remains an elusive goal. Herein, we disclose a C(sp^3)—N fragment coupling reaction between abundant terminal olefins and *N*-triflyl protected aliphatic and aromatic amines via Pd(II)/sulfoxide-oxazoline (SOX) catalyzed intermolecular allylic C-H amination. A range of (52) allylic amines are furnished in good yields (avg. 76%) and excellent regio- and stereoselectivity (avg. >20:1 linear:branched, >20:1 *E:Z)*. For the first time, a variety of singly activated aromatic and aliphatic nitrogen nucleophiles, including ones with stereochemical elements, can be used in fragment coupling stoichiometries for intermolecular C-H amination reactions. Mechanistic studies reveal that the SOX ligand framework is uniquely effective at promoting functionalizations with such alkyl amine nucleophiles in the absence of any other activators.