



Precompetitive Collaborations: Enabling Technologies for the Pharmaceutical Industry

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Needed Technologies at Merck



- Annual assessment of technology needs across the company
- A subset of these needs are communicated externally
- www.merck.com/licensing



- Areas where Merck is willing to collaborate
- Several of these areas may be suitable for precompetitive collaboration



Which areas best suited for precompetitive collaboration?

- Common industry need, not part of key differentiating strategies
- Faster, Better, Cheaper, Greener



'technology driven'

'Palladium Chemistry' ...



...with inexpensive metals

Greener:

- flash chromatography
- solvent free reactions
- solvent recovery
- oxidation



Cryogen-free NMR
*(...also, benchtop,
< \$100k...)*

Generally enabling laboratory tools:

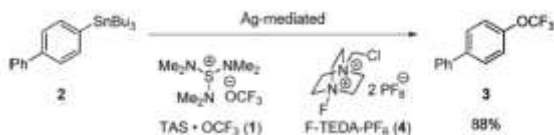
- reagents and reactions
- general labware and equipment
- intelligent analytical equipment
- electronic notebooks, structure drawing software, predictive tools, *etc*

Collaborating with Academia to create needed capabilities: Fluorination Platforms

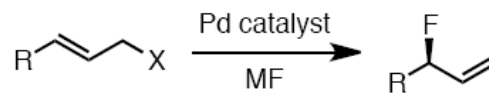
- Platform fluorination reactions identified as critical need for Merck Chemistry
- Funded collaborations with ‘rising stars’ in chemistry are delivering results
- Reactions beginning to be implemented in Merck Chemistry



Professor Tobias Ritter



Professor Abigail Doyle



- **branched-selective**
- **enantioselective catalysis**



“Fluorine newcomer John F. Hartwig of the University of California, Berkeley, thinks the spark that ignited the flurry of fluorine activity came from pharmaceutical companies better articulating their unmet needs”

Chemical & Engineering News, Feb 27, 2012 p 10-17