Objective

Transition metal-catalysed cross-coupling reactions are considered landmark achievements in organic synthesis; thus, a modern organic chemist’s toolbox is filled with methods building C(sp2)-C(sp2) bonds. However, the myriad of tetrahedral carbon atoms in organic molecules alongside the ever-growing interest in drug discovery and development to access the tree-dimensional chemical space has encouraged chemists to develop cross-couplings that involve C(sp3) atoms. Despite their ubiquitous nature, the most available sources of functionalised C(sp3) atoms, alcohols, are underutilised in cross-coupling reactions due to the difficulty associated with the C(sp3)-O cleavage step. Their mainstream adaptation for cross-coupling reactions would unlock a previously untapped chemical space by virtue of their structural diversity, stability, and convenience. Furthermore, shifting the focus from...
halides to more environmentally benign alcohols offers a green and sustainable future by minimising manufacturing costs and toxic waste. Therefore, the overarching goal of this proposed research programme is to devise new, generally applicable, and modular methodologies in organic chemistry to address the long-standing challenge of alkyl radical generation from alcohols; thus, making the C(sp3)-OH bond a mainstream radical cross-coupling handle. Using transition metal catalysis, downstream application of these radicals would construct C(sp3)-C(sp3), C(sp3)-C(sp2), and C(sp3)-heteroatom bonds furnishing complex structures from ubiquitous precursors. In order to harness the potential of native alcohols, and to achieve the aims of this proposal, the outgoing phase of this fellowship would take place in Prof. Phil S. Baran’s laboratory at Scripps Research, La Jolla, USA. During the third, final year, the incoming phase would take place at Dr. Josep Cornella’s laboratory at Max-Planck-Institut, Mülheim an der Ruhr, Germany.

**Fields of science**

- medical and health sciences ➔ basic medicine ➔ pharmacology and pharmacy ➔ drug discovery
- natural sciences ➔ chemical sciences ➔ organic chemistry ➔ alcohols
- natural sciences ➔ chemical sciences ➔ catalysis

**Keywords**

- Radical chemistry
- Alcohol activation
- Electrosynthesis
- Transition Metal Catalysis

**Programme(s)**

- [HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA)](#) - MAIN PROGRAMME

**Topic(s)**

- [HORIZON-MSCA-2022-PF-01-01 - MSCA Postdoctoral Fellowships 2022](#)

**Call for proposal**

- [HORIZON-MSCA-2022-PF-01](#)

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Funding Scheme

HORIZON-TMA-MSCA-PF-GF - HORIZON TMA MSCA Postdoctoral Fellowships - Global Fellowships

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Activity type
Research Organisations
Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network
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