In this talk I will discuss some of the reasons why molecules incorporating fluorine atoms are becoming applied more and more in biologically active systems. Despite the fact that bioactive fluorinated systems in nature are extremely rare (only 5 fluorinated natural products have been reported), the incorporation of fluorine into pharmaceuticals is now a commonly used strategy to improve bioactivity. Over 30% of all commercial pharmaceuticals contain a fluorine atom. Fluorine is also seeing increasing use in biological imaging, and application to $^{18}$F PET radioimaging will be discussed.

However, fluorinated compounds can be extremely challenging to synthesize. Fluorinating reagents can be extremely toxic, difficult-to-handle or even dangerous, as well as often suffering from poor reactivity. A key aim of my research is the discovery and development of new synthetic methodology which allows the incorporation of fluorine into organic molecules under mild, safe and sustainable conditions. Several new reactions towards achieving this goal that have been recently discovered in my group will be presented.¹

Fluorine is found in many of the world's best-selling drugs

**Prozac** - Antidepressant

**Lipitor** - Statin

New fluorination reactions

![Fluorination reaction](image)

New fluorinated building blocks

![Fluorinated building blocks](image)