

## DEAMINATIVE SYNTHESIS OF ALKYL FLUORIDES FROM AMINES VIA PHOTOREDOX CATALYSIS

---

*Jakub Durka*

The events happening around the world in 2020 have shown the importance of the healthcare system. Its lack, poor quality, or limited availability led to many human dramas. One of the key factors in the health care is access to medical drugs. Without them, it is impossible to combat the symptoms of a disease or eliminate factors causing them. The pharmaceutical industry is not only responsible for the production of medicines but also for developing new medicinal substances, studying their effects, and then synthesizing them on a large scale. In all these steps, it is necessary to apply knowledge from organic chemistry. That is why, **the continuous progress in this field, including the development of new methods, is essential to create new drugs and to facilitate access to the existing ones.** At the same time, more and more emphasis is placed on chemical industry to be more environmentally friendly.

Amines are a very important group of organic compounds without which, life as we know it, would be impossible. They are present in every cell, being a part of, for example, proteins or DNA. Due to their importance in life processes, many medicinal substances also contain the amine group in their structures.

Another class of compounds, very popular in pharmaceuticals, are organic fluorides. Recently, they attracted a lot of attention from medicinal chemists. It has already been estimated that about 20% of medicinal substances contain fluorine atoms in their molecules. In turn, among the compounds used in agriculture, their content has already reached 40%.

The advancement in organic synthesis is critical to the availability of drugs. **Nevertheless, there is no universal method for the synthesis of fluorides from amines. Therefore, the goal of my project is to develop such a methodology. It will enable access to various fluorine substituted derivatives from compounds of even greater importance in pharmacy, and therefore would be of huge significance.** Moreover, due to the use of photocatalysis, the energy for the reaction will be delivered in the form of the purest and practically inexhaustible source - light. In turn, the use of non-halogenated solvents will significantly reduce the amount of toxic wastes generated while the use of an appropriate photocatalyst will completely eliminate the need to use heavy metals. **Due to the aforementioned advantages, I believe that the described project, in addition to its scientific significance, may be used in real industrial syntheses of life-saving substances.**