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"Synthesis of aminophosphonic compounds containing fluorogenic units"

Cancer is currently one of the most common causes of deaths resulting from chronic diseases. With the development of science, the invention of innovative, precise and minimally invasive methods of diagnosis is progressing. These tools are built up to allow the detection of changes already at the level of metabolomic disorders.

In the field of organic chemistry, there are many groups of compounds that are active as biologically relevant molecules. An interesting class of compounds in these respect concern organophosphorus ones, with aminophosphonic acids and their derivatives being of particular interest. They exhibit a number of important properties, among others: interaction with metal ions, small organic molecules or large protein structures. Numerous aminophosphonic compounds are potent enzyme inhibitors.

Tumor cells produce and use some enzyme proteins (often referred to as disease markers) in a different way than healthy cells. This fact raises the possibility to suppose that the introduction of a modified aminophosphonate molecule by its selective labelling will gave compounds differently reacting with cocktail of produced by healthy and cancer tissues. As a result, it could allow creating a matrix (matrix) that differentiates healthy and diseased tissues.

The scope of this dissertation was to create a group of aminophosphonates and their derivatives, capable to fluorerize, which was treated as the first stage to create a diagnostic chip.

This task was carried out using the classical methodology of organic synthesis, however, structures of the designed compounds required a significant modifications of these procedures. The work also included a preliminary assessment of the fluorescence capabilities of the obtained structures.