NEW FAMILY OF MOLECULES AGAINST BACTERIA, VIRUSES AND CANCER

PATENTED TECHNOLOGY

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ABSTRACT

The research group "Catalytic Processes in Organic Synthesis" of the University of Alicante has developed a procedure to synthesize nucleosidic homologues (azanucleosides) in order to obtain molecules able to inhibit development of bacteria, viruses and cancer.

The main advantages of this technology are: easy process of synthesis and low cost drugs. It can be used in the following industrial sectors: pharmaceutical, food packaging films and containers, insecticides, etc.

These compounds have been synthesized in laboratory scale and preliminary biological in vitro test revealed inhibition of Herpes Simplex Virus (HSV-1), Escherichia coli and breast tumour cell line MCF-7. The research group is looking for companies acquiring this technology for licensing agreement, manufacturing agreement, technical cooperation or a combination of some of these services.

ADVANTAGES AND INNOVATIVE ASPECTS

MAIN ADVANTAGES OF THE TECHNOLOGY

This technology regards the synthesis of new compounds which are nucleoside homologues (azanucleosides) through a multicomponent 1,3-dipolar cycloaddition employing aldehydes bearing a purine or a pyrimidine base (or another heterocycle) similar to those employed in the genetic material by animals and plants.

Final compounds and their derivatives are **completely new**, and in most cases, starting aldehydes have not been described previously in scientific literature.

Presumably, these new drugs can be **more efficient, inexpensive and would avoid resistance mechanisms** of the pathogens against themselves.

Another advantage of these family of molecules is their capability of interact into DNA/RNA strands of the malicious microorganisms or cells inhibiting their reproduction. Through this strategy, it will be able to increase the antimicrobial or anti-tumoural spectrum.

INNOVATIVE ASPECTS

This new technology allows to synthesize small molecules with a simple skeleton. **These molecules are not expensive** and the **procedure takes place in a mild reaction conditions with a total atom economy**. The multicomponent feature means that the domino sequence occurs previously to formation of the imino ester followed by the cycloaddition process.

The inhibitor potential character can be impressive. In addition, enantioselective synthesis of the most active molecules can be designed according previous experience of the research group in asymmetric catalysis involving 1,3-dipolar cycloadditions between azomethine ylides and electrophilic alkenes.

MARKET APPLICATIONS

This technology is framed within Pharmaceutical Chemistry, and relates to a method to synthesize nucleosidic homologues (azanucleosides) and their use in the manufacture of drugs for the treatment of:

- Bacteria diseases (Escherichia coli, etc.).
- Viral diseases (retroviruses such as hepatitis C, HIV, Herpes Simplex Virus, etc.).
- Cancer (breast tumour cell line MCF-7).

This family of molecules can also be applied in agriculture (phytosanitary treatments for fungal infections), and in the food industry (coating films to avoid microbial contamination).

COLLABORATION SOUGHT

The research group is looking for companies interested in acquiring this technology for commercial exploitation by:

- Licensing agreement.
- Financial support for all required tests.
- Agreements in technology transfer or knowledge transfer.