Міністерство охорони здоров'я України
Тернопільський національний медичний університет імені І. Я. Горбачевського Міністерства охорони здоров'я України

Матеріали X науково-практичної конференції з міжнародною участю

НАУКОВО-ТЕХНІЧНИЙ ПРОГРЕС І ОПТИМІЗАЦІЯ ТЕХНОЛОГІЧНИХ ПРОЦЕСІВ СТВОРЕННЯ ЛІКАРСЬКИХ ПРЕПАРАТІВ

присвячена пам'яті завідувача кафедри управління та економіки фармації з технологією ліків, доктора фармацевтичних наук, професора Тараса Андрійовича Грошового

17-18 жовтня 2024 року

COSMETIC RISK ASSESSMENT OF 2-((4-R-5-(THIOPHEN-2-YL)-4H-1,2,4-TRIAZOL-3-YL)THIO)ACETIC ACID DERIVATIVES

Salionov V., Kornienko O.
Zaporizhzhia State Medical and Pharmaceutical University,
Zaporizhzhia, Ukraine
salionov88@ukr.net

Introduction. Recently, triazole derivatives attracted attention as a tyrosinase inhibitors, so they have a wide potential application in food, agriculture, cosmetics, and pharmaceutical industries as anticancer, antibacterial, anticancer, skin whitening, etc. substances [1]. By conducting comprehensive toxicity tests, safer products can be created, comply with regulations, and build consumer trust.

The aim of the work. To assess if the studied compounds can cause 9 categories of toxicity related to eye, skin, and phototoxicity

Materials and Methods. The AdmetSAR3.0 platform [2] was used as a convenient approach for the systematic, comprehensive, and accurate assessment of cosmetic risk (eye corrosion and irritation; skin corrosion, irritation, and sensitization; acute dermal and photoinduced toxicity; phototoxicity; and photoallergy) of 2-((4-R-5-(thiophen-2-yl)-4*H*-1,2,4-triazol-3-yl)thio)acetic acid derivatives (Fig.).

Results: According to their physicochemical parameters, all substances representing carboxylic acids, amides, and hydrazides (Fig.) accept Lipinski, Pfizer, and GSK rules, therefore, they are recommended to undergo a toxicology test.

Hence, after AdmetSAR3.0 screening, hydrazides (**h1**-**4**) generally show lower toxicity across most categories with the lowest scores in eye corrosion and skin corrosion, and moderate in acute dermal and photoinduced toxicity. Amides (**a1**-**4**) have moderate toxicity, with higher scores in skin sensitization compared to hydrazides. Also, they generally have higher scores in photoinduced toxicity and photoallergicity. Carboxylic acids (**c1**-**4**) have the highest overall toxicity among the three groups, with significantly higher scores in eye corrosion and irritation, skin irritation, in addition to high scores in acute dermal toxicity.

So, the most concerning substances are: **c2** with the highest probability of toxicity in acute dermal toxicity (0.820), eye (0.734) and skin irritation (0.571); **c1**: also high scores in acute dermal toxicity (0.877), in eye (0.653) and skin (0.516) irritation, and **c3**: high results across many categories, particularly in in acute dermal toxicity (0.781).

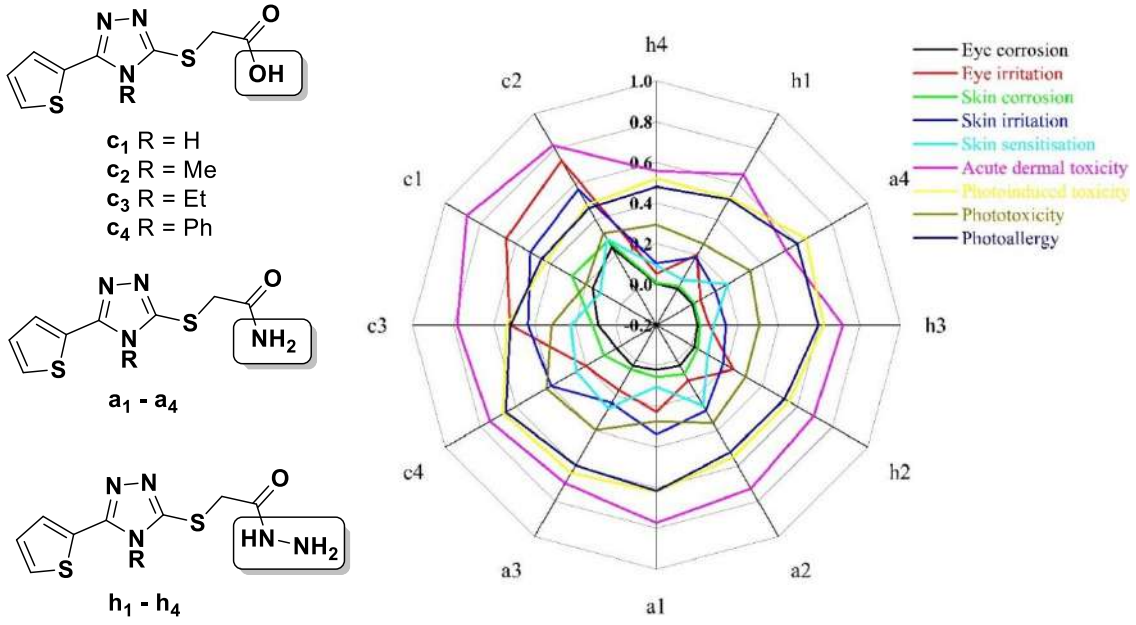

Fig. Structures of studied substances, and AdmetSAR3.0 cosmetic risk assessment screening results from the lowest toxicity of **h4** to the highest of **c2**.

On the other side, **h4** has the lowest scores in eye corrosion (0.003) and irritation (0.052); **h3**: low probabilities in eye (0.003) and skin corrosion (0.013); and **a4:** generally, all low results, except for moderate photoinduced toxicity (0.650).

Conclusions. 2-((4-R-5-(thiophen-2-yl)-4*H*-1,2,4-triazol-3-yl)thio)acetic acids mostly show the highest toxicity across various risks, and may require the most careful consideration in cosmetic formulations. Group of hydrazide derivatives **h** appear to be the least toxic overall, with amides **a** falling in between. This testing is a critical step in the development and marketing of cosmetic products, where pharmaceutical grade compounds can be incorporated into cosmetic formulations to provide a variety of specific benefits.

References:

1. Mermer A., Demirci S. Recent advances in triazoles as tyrosinase inhibitors. *Eur. J. Med. Chem*. 2023. Vol. 259, P. 115655.

2. AdmetSAR 3.0: Predict. Laboratory of Molecular Modeling and Design. URL: https://lmmd.ecust.edu.cn/admetsar3/predict.php (date of access: 19.09.2024).

CHANGE IN MORPHOFUNCTIONAL CHARACTERISTICS OF THE LIVER IN DRUG-INDUCED HEPATITIS BY MEDICINAL PLANTS

Samadov B.
Bukhara State Medical Institute named after Abu Ali ibn Sino, Bukhara, Uzbekistan

Abstract: This study evaluates a model of toxic hepatitis induced by tetrachloromethane and the hepatoprotective effects of milk thistle. The results demonstrate that milk thistle significantly improves biochemical markers and reduces toxicity, aiding in liver function restoration and homeostasis.

Keywords: toxic hepatitis, milk thistle, hepatoprotectors, tetrachloromethane, liver regeneration

Relevance. Liver damage can cause serious metabolic disorders, detoxification and protection of the body from microbes, as the liver plays a key role in the functioning of many systems. It is involved in the processing of nutrients, the synthesis of essential components, the purification of toxins and the elimination of harmful substances. In economically developed countries, chronic liver disease is one of the six main causes of death among people aged 35 to 60 years, with a frequency of 14-30 cases per 100,000 populations. Every year, about 40 million people die worldwide from cirrhosis of the liver and cancer associated with the hepatitis B virus. In the CIS countries, cirrhosis occurs in about 1% of the population, and this problem occurs three times more often among men than among women. Although the disease can manifest itself at any age, it is more common after the age of 40.

The purpose of the study. Creation of a modified model of liver damage using carbon tetrachloride to study the pathology of the organ and subsequent correction of impaired liver functions using a medicinal plant milk thistle grown in the fields of the Bukhara State Medical Institute.

Materials and methods of research. The experiments were conducted on 60 male rats weighing 200-220 g. In the first group (30 rats), animals were injected with carbon tetrachloride in petroleum jelly oil (0.064 ml per 100 g of weight). In the second group (30 rats), milk thistle was additionally injected in the form of powder with water (10 g). Biochemical blood parameters (ALT, AST, alkaline phosphatase, total bilirubin) were studied, and histomorphological analysis of liver tissues was performed.

Results and discussion. In the first group of laboratory rats exposed to carbon tetrachloride, after 5 days, significant cytolysis of hepatocytes, damage to Kupfer cells, densification of cell nuclei, the onset of the inflammatory process and dystrophy of liver cells were