Short Communication

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Short Comminication on the Potential Activity of Potassium Hydroxide on the Formation of Low-Weight Immunoglobulin

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ABSTRACT

Advances in technology and industry have sometimes negatively affected human life in harmony with nature. Some of the important ones are the increasing health problems, especially allergic, immunological, viral diseases and cancer. These increasing health problems have brought about the search for antibody treatments. In the discussed study, the potential effectiveness of the spontaneous intermolecular exergonic interaction between potassium hydroxide(KOH) and immunoglobulin(Ig) heavy and light chain disulfide bonds on low molecular weight Ig formation was emphasized. In this article, the results of the effect of KOH on disulfide bonds in Ig are discussed in the light of previous knowledge. The interest of KOH in the region of disulfide bonds, which leads to breakage and increased mobility in Ig structures, is quite remarkable. Therefore, KOH inhalation may be a potential molecule in the treatment of many diseases such as allergic, immunological, viral diseases and cancer.

Keywords: Potassium Hydroxide; Immunoglobulin; Nanobody; Single-Domain Antibody; Cancer; Immunology; Allergy; Covid-19; Antiviral

Introduction

With the spread of modern life, the use of chemical substances is increasing day by day. With the addition of undesirable nature effects such as global warming to these effects, many diseases such as allergic, immunological, viral diseases and cancer emerge. Ig's play a very important role in the recognition of molecular structures that are effective in the emergence of diseases. That's why research on the structure and functions of Ig's is advancing rapidly with technology [1]. Especially after the 1990s, with the clarification of camelid Ig structures, the interest in treatment possibilities with these Ig structures has increased considerably [2]. In studies on these subjects, small Ig structures with reduced weight but increased mobilization were synthesized. The potential of use of single-domain antibodies in the last 3-4 decades has increased the interest in studies. In this way, there have been developments in the treatment of many diseases such as allergic, immunological, viral diseases or cancer. In the in silico study included in the discussion, it was found that the binding affinity of KOH to the region of the disulfide bonds between the heavy and light chain on the Ig structure with -1 kcal/mol increased up to the level of -3 kcal/mol with the increase in the number of KOH molecules [3]. The study showed the potential of this effect to form new small-weight Ig by breaking the disulfide bond between the heavy and light chains (Figure 1). In this study, it is stated that with KOH inhalation, each person can form small-weighted Ig from their own Ig in their own lungs. However, it is known that KOH is a highly corrosive substance [4]. Does the use of this inhaler containing corrosive molecules cause damage to the lungs? Hypochlorous acid (HOCl), which the body produces and uses itself, can be a good example

of this. HOCl is a highly irritating molecule for humans. However, HOCl is used in body defense by being formed from H2O2, Cl and H by myeloperoxidase in leukocytes [5,6]. If HOCl is not used, many diseases that can result in death can be encountered. But the HOCl used in the cell is at a very low concentration.

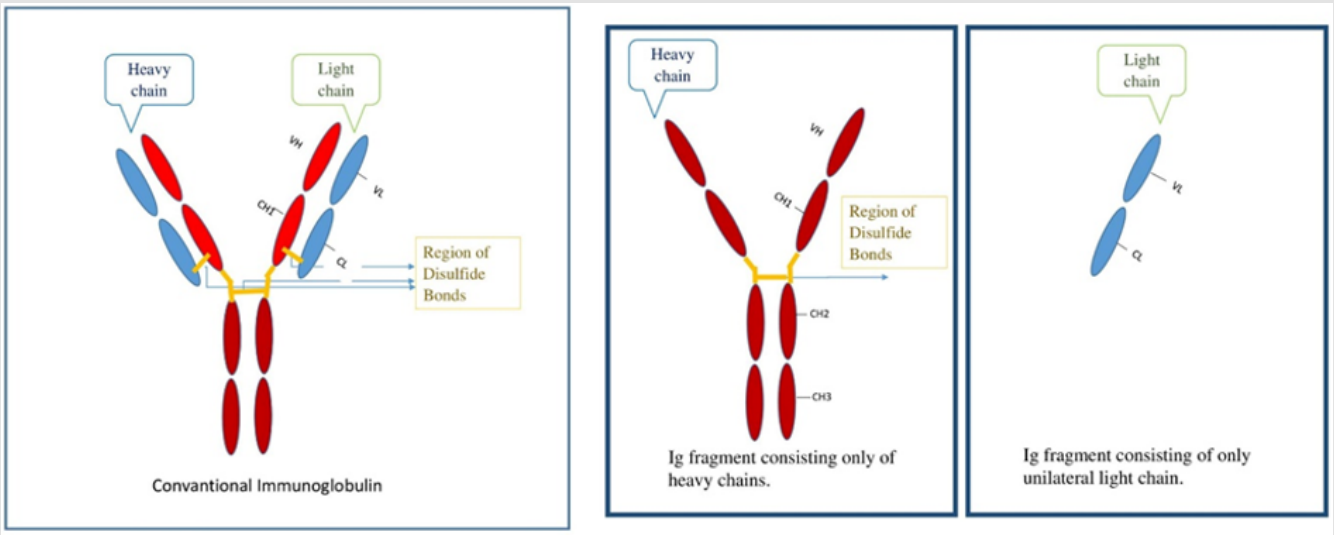

Figure 1: Conventional immunoglobulin, and potential light-weight immunoglobulins that may be formed by the action of KOH.

Therefore, it can be thought that it can be used in treatment by regulating the KOH concentration with optimization studies. In the previous study on the antiviral properties of KOH, KOH was used as an inhaler [7]). In order to prevent the known corrosive effect of KOH inhalation, it is buffered to pH: 8.9-9.0, which is the highest pH value of drinking water for humans. It was administered as an inhaler to the lungs of mice in a solution of 08.9-0.9% sodium chloride in distilled water compatible with the fluid used for irrigation of the bronchi. As a result, it has been shown in this study that KOH has a decreased contact angle of mucus in the bronchoalveolar fluid, no histopathological findings in the oral region and lung tissue, and positively affects oxidative stress in the lung tissue. In addition, in a non-invasive clinical in vitro experiment, it was shown that the surface tension of the mucus decreased, the contact angle decreased, and the alkalinization increased with the application of KOH in human mucus.

In the same study, it was determined that KOH solution prolongs fibroblast survival time in cell culture (MTT) by 49% in 24 hours. These studies are thought to be in harmony with the positive effects of KOH demonstrated by in vitro and in vivo studies. Another positive factor may be that the alkalinization effect of KOH on the mucus in the lung has a positive effect on the movements of the Ig in the mucus. Expressive proteomics for the detection of low-weight Ig expressed in the study and functional proteomic studies for its effectiveness are needed. It is a positive factor that breaks between heavy and light chains reveal new antigen recognition sites on Ig in addition to Ig mobilization [8,9]. With lower weight and more mobile different Ig's that can be formed in Ig's in the mucus in the lungs, there is a potential for a more effective treatment and prevention of diseases and Ig response in all tissues at a much earlier time. Considering the success of small molecular weight Ig in the treatment of diseases in previous studies [10,11], this potential effect of KOH is considered to be very important. With all these findings, optimization studies and clinical studies are needed for the potential positive efficacy of KOH inhalation.

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