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Letter to Editor

Antimicrobial Peptides in the Anticorona Combat

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Neutrophils (white blood cells) help the immune system fight infections and heal injuries. Neutrophils are the most common type of white blood cell in your body. A complete neutrophil count identifies if your body has enough neutrophils or if your count is above or below a healthy range. Antimicrobial products such as AMPs (Antimicrobial Peptides) or AVP (Anti-Viral Peptides) or their synthetic imitations of antimicrobial peptides (SMAMPs) [1].

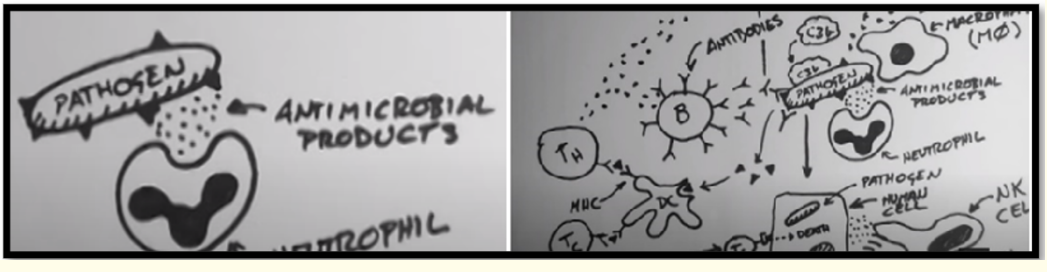

Figure 1: *Antimicrobial substances (like AMP) combat pathogens in the onset of inflammation at the earliest stage of the immune defense (credit ref. [2]).*

Prelude

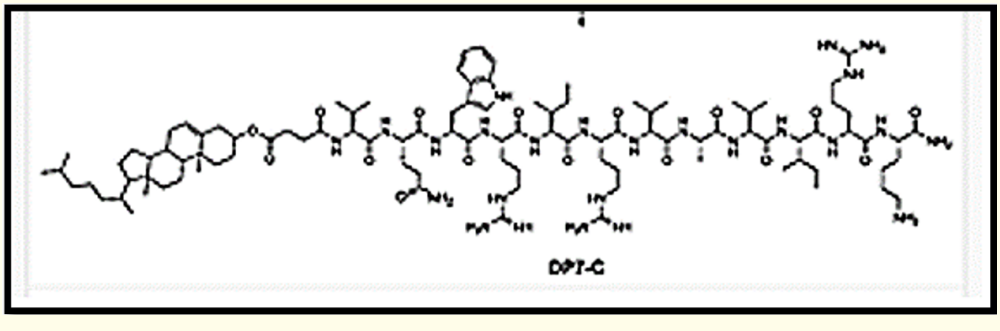

Figure 2: *Antimicrobial peptide DP7 with potential activity against SARS coronavirus infections.*

Recently [3-5], Several articles have been published on the ability of antimicrobial peptides to destroy the virus responsible for coronary heart disease. For two years, the plague rocked humanity, and everything related - industry, the economy, and the pace of life alongside death and mysterious diseases. Biotechnology has provided humanity with two main things to deal with the disease: the technology for making a serum for vaccination against this serious disease in a method developed just about a decade ago, an established mRNA that has previously succeeded in weakening various influenza vulnerabilities [6]. COVID-19 presents a therapeutic target to reveal that mRNA vaccines can become very useful. Now, drug companies are racing to apply the technology platform for the common flu [7]. The Nobel Prize-winning technology for the gene editing. Useful for preparation of various nucleic acids in a method known as CRISPER [8,9]. With all these effective medicinal substances to eradicate the disease, but only to alleviate its harm in a palliative manner [10]. COVID-19 presents an opportunity to establish that mRNA vaccines can help. Now, drug manufacturers are focusing on implementing the common flu technology platform. Palliative care plays an important role in this epidemic. Palliative care has rapidly developed services and opportunities have been found to support patients, families and physicians. Further developments undertake to address future epidemic requirements, including integrated palliative care and education in palliative care skills in all specializations. Intervention studies are needed to enable evidence-based recommendations for palliative care for COVID-19.

The need for the development of a cure for the disease still exists. And already today we hear about outbreaks in North Korea and patients of many millions there. The antibacterial peptides can serve as a marker for developing new drugs based on the chemical structure of these natural product substances [11-13].

Demand for optimized peptides with improved stability profiles and pharmacokinetics precludes extensive research on Dermaseptin (Department of peptide substances isolated from jungle frogs in South America). Is an effort, for example, in this area [17].

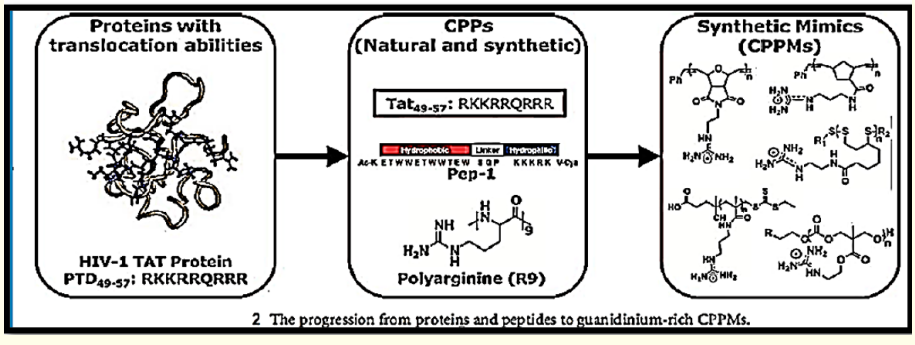

Figure 3: *The conversion scheme of a natural product with antimicrobial properties to an antimicrobial drug substance [15].*

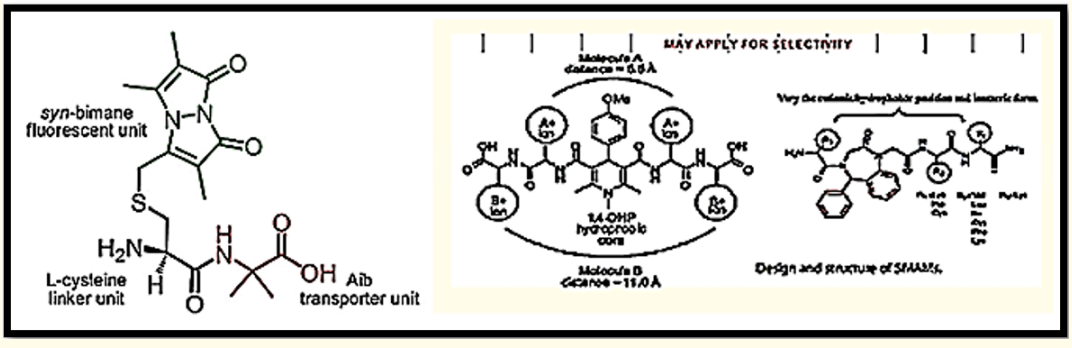

Figure 4: *Peptide surrogates that cross BBB [16].*

The conversion of peptides to organic molecules (SMAMPS), like traditional medicines, is a long and puzzling road of synthetic technology. Many and varied approaches to the design for the imitation peptides have been described: the replacement of natural residues with adapted amino acids and the hardening and alteration of the peptide backbone are the main structural and chemical pathways that have gone in synthetic medical chemistry. All these strategies have been successfully implemented to obtain new compounds [17] active in medical chemistry, molecular biology and drug discovery and design. Here we offer here a panoramic overview of the most common methods for making customized peptides and the most interesting findings of the last decade.

Antimicrobial peptides and other peptide-like therapeutics as candidates to combat SARS-CoV-2 [18]

There are practically very few specific drugs and universal vaccines for Corona 2019 (COVID-19), so urgent effective measures are needed to detect and develop therapeutic substances. The application of peptide therapies and related compounds is a promising strategy to achieve this goal. This review is based on a literature search using a number of databases, previous studies, scientific reports, our current knowledge of antimicrobial peptides (AMPs) and our analyzes of the potential of antiviral peptides to treat COVID-19. Regardless of their limitations, AVPs and other peptide-like drugs are promising candidates to fight SARS-CoV-2. Although there are reports of a number of therapeutic peptides developed to control SARS-CoV-2 and COVID19 therapy, we strongly recommend paying more attention to these molecules and conducting more accurate and comprehensive studies in this area. In our opinion, many of the peptides or peptidomimetics listed in this article such as melittin, lactarane, entireties and rupintrivir have the potential to enter into animal and clinical trials to treat COVID-19.

Novel nitrile peptidomimetics for treating COVID-19 [19]

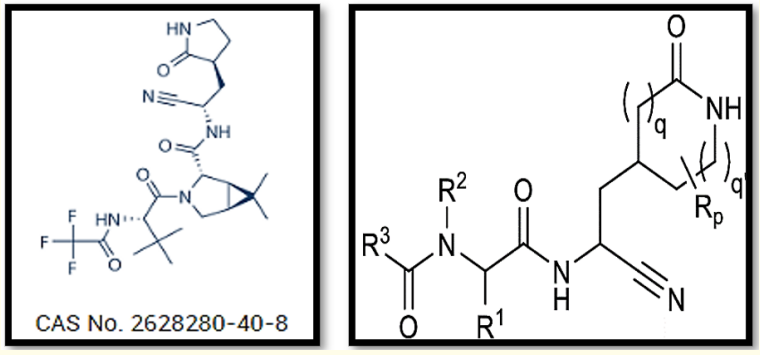

Figure 5: *Nirmatrelvir (PF-07321332) [20].*

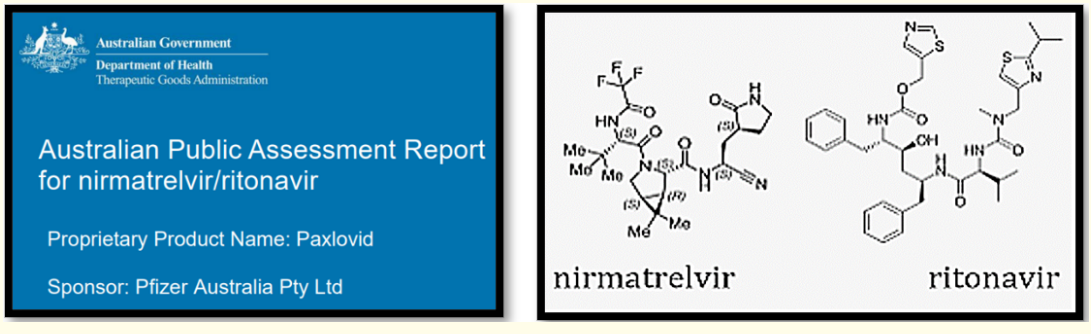

Figure 6: *Paxlovid [21].*

COVID-19 may become a dangerous infectious disease caused by the viral pathogen SARS-CoV-2, causing an estimated 5.4 million deaths worldwide in the two years since its onset in December 2019. On December 22, 2021, the US FDA granted emergency use approval for an inhibitor Oral viral protease, Nirmatrelvir, for the treatment of patients with mild to moderate COVID-19. Various applications have been shown for antimicrobial peptides as anti-infective agents. The broad antimicrobial spectrum of antimicrobial peptides accounts for them as "chemical condoms" to limit the spread of sexually transmitted diseases, like *Neisseria, Chlamydia* [22] the human immunodeficiency virus (HIV) and HSV (Herpes Simplex Virus). The affinity of antimicrobial peptides for microbial membranes has encouraged their evaluation as imaging tests for bacterial and fungal infections. Antimicrobial peptides can increase the potency of existing antibiotics in vivo, presumably by facilitating access of antibiotics to the bacterial cell, a phenomenon previously recognized for the cationic peptide component of polymyxin [23].

Now with the emergence of the newest preparation from Pfizer's antiviral Paxlovid effective against severe disease and Omicron variant.

Analysis of the Phase II/III trial for Paxlovid found it reduced the risk of hospitalisation or death by almost 90% [24].

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