

## TMPRSS2 – a potential new drug target and a determinant of COVID19 outcome

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Every day and from everywhere, we receive information about new cases of coronavirus disease (COVID19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2). The causes of the various course of the diseases (from asymptomatic to severe and even death), as well as effective drugs against COVID19, remain unknown to this day. Identification of host cell genes and proteins, which are necessary for SARS-CoV2, may help understand the pathophysiology of the disease as well as find new drugs.

The aims of the following project are:

- analysis of the relationship between the sequence of genes involved in the SARS-CoV2 entry into host cell, i.e. *TMPRSS2* and *ACE2*, and the course of COVID19;
- finding new effective inhibitors of *TMPRSS2* protein, which is necessary for SARS-CoV2 entry into host cell.

Within the project, we will use tests which detect antibodies against SARS-CoV2 among volunteers, to examine which percentage of Polish society has undergone COVID19 asymptotically. In addition, by analyzing the genetic material of the above-mentioned volunteers, we will compare the nucleotide sequence of *TMPRSS2* and *ACE2* genes in people with severe and asymptomatic course of COVID19. Thus, we will be able to determine if there are a genetic predisposition to severe acute respiratory syndrome, caused by SARS-CoV2. Moreover, using high-tech high-throughput screening and molecular virology methods, we are going to examine thousands of chemical compounds to identify effective inhibitors of *TMPRSS2* protein, and thus find an effective drug against COVID19.

To sum up, we believe that this study will provide a better understanding of the underlying cause of COVID19 and contribute to the development of an effective strategy against SARS-CoV2.

