Enamine Ltd. Released Coronavirus Library to Support COVID-19 Research Programs

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A preplated library of 16800 compounds designed for the discovery of new SARS-CoV-2 and pan-Coronavirus antivirals

KIEV, Ukraine -- Enamine Ltd., a leading chemical research organization and producer of the world's largest collections of novel building blocks (225,000+) and screening compound libraries (2,740,000+), today announced the release of the Coronavirus Library. The new screening library capitalizes on Enamine's decades of chemical R&D, advanced library design expertise, and experience with creating focused antiviral libraries. Enamine is a participant of a global Open Science initiative "COVID Moonshot", aimed at discovering novel therapeutics against SARS-CoV-2.

An unprecedented biotech race is now on to design cures for COVID-19 and to curb the crisis until a reliable vaccine is available and widely adopted. While most of the efforts are focused on drug repurposing strategies, the discovery of novel molecules is essential for achieving sufficient specificity and efficacy towards the new SARS-CoV-2 virus.

To meet the urgent need for potent new antivirals against COVID-19, Enamine has designed and preplated a small-molecule compound library focusing on SARS-CoV important targets, available for quick delivery to any screening drug discovery labs:

SARS-CoV-2 main protease Mpro (also called 3CLpro)

RNA-dependent RNA polymerase (RdRp)

Papain-like protease (PLpro)

Angiotensin-converting enzyme 2 (ACE2) receptor

Type-II transmembrane serine protease (TMPRSS2)

Non-structual proteins (NSP) of SARS-CoV-2, with reported 3D-struture.

The docking models were validated by short MD simulations and verified then by ability to form complexes with reported active molecules. For cysteine and serine proteases (Mpro and TMPRSS2) covalent docking has been carried out to identify promising covalent binders, which can elongate inhibition action. The databases of screening compounds were preliminary filtered to contain only compounds with specific warheads that are selective to each amino acid:

Mpro focused Covalent sublibrary: 2 640 compounds (acrylamides, chloroacetamides, vinyl sulfones and beta-lactams)

TMPRSS2 focused Covalent sublibrary: 560 compounds (sulfonyl fluorides, N-nitriles, chloroacetamides, epoxides, boronics)

The Coronavirus Library consists of 7 sublibraries, which can be acquired independently if desired. All other target-focused sublibraries passed stringent MedChem filters, including PAINS and Molecular Parameters restrictions to represent mainly lead-like space. The hits derived from the Corona Library can be easily followed with analogs and growing strategy to maximize MedChem variability within the structure.

Michael Bossert, Head of Strategic Alliances at Enamine, commented: “At the time when SARS-CoV-2 started its spread, international research solidarity emerged rapidly with several contributions from various players announced around the globe. At Enamine we were prompt to act too. Our scientists came more recently with this small library of high-quality compounds, which is aimed to serve as a strong basis to potentially identify interesting hit molecules for drug discovery programs initiation that might be further developed into medicines by our broad network of drug hunters. Enamine hit follow-up early discovery chemistry and pre-clinical biology services are with such library fully accessible each time when needed, being services deployed within COVID Moonshot and among other research collaborations not limited to antivirals.”

For further information on the Coronavirus Library:
https://enamine.net/hit-finding/focused-libraries/coronavirus-library

- Enamine