

Usefulness of Zybio EXM3000 system in respiratory virus infection

In our lab, we are detecting respiratory viruses for more than 6 years. During the SARS-CoV-2 epidemics, we have used different kits to extract viral RNA including Qiagen QiaAmp Viral RNA Mini Kit, QiaSymphony DSP kits, GXT NA extraction kit (Hain), MagCore Viral Nucleic Acid Extraction kits. The shortest time to extract RNA with our approaches was 45 minutes for only limited number of samples (12 per run). In this consequence, extraction of RNA during 10 minutes in 32 samples in one run is revolutionary for high throughput testing.

During the validation process, we have tested samples from Quality Control for Molecular Diagnostics (QCMD) for respiratory viruses and compared the results with our standard extraction techniques. Our results from challenge (C) 1 are shown in table bellow.

| Sample / Extraction method | Detected virus | Quantity |
|---------------------------------------|------------------------------------|---------------|
| Respi I C1-1 / GXT NA extraction kit | Influenza A virus (H3N2) | 102 |
| Respi I C1-1 / ZyBio | | 83 |
| Respi I C1-2 / GXT NA extraction kit | Influenza A virus (H3N2) | 1142 |
| Respi I C1-2 / ZyBio | | 329 |
| Respi I C1-3 / GXT NA extraction kit | Influenza B virus | 200 |
| Respi I C1-3 / ZyBio | | 53 |
| Respi I C1-4 / GXT NA extraction kit | Influenza A virus (H1N1) and RSV-A | 2757 and 1928 |
| Respi I C1-4 / ZyBio | | 359 and 980 |
| Respi I C1-5 / GXT NA extraction kit | RSV-B | 1821 |
| Respi I C1-5 / ZyBio | | 1101 |
| Respi II C1-1 / GXT NA extraction kit | human Metapneumovirus - A | 2544 |
| Respi II C1-1 / ZyBio | | 934 |
| Respi II C1-2 / GXT NA extraction kit | Adenovirus | 223 |
| Respi II C1-2 / ZyBio | | 9 |
| Respi II C1-3 / GXT NA extraction kit | Negative | NA |
| Respi II C1-3 / ZyBio | | NA |
| Respi II C1-4 / GXT NA extraction kit | seasonal coronavirus | 252 |
| Respi II C1-4 / ZyBio | | 16 |
| Respi II C1-5 / GXT NA extraction kit | human Rhinovirus | 96949 |
| Respi II C1-5 / ZyBio | | 47712 |

When we take into account the difference in primary volume of the sample (GXT NA extraction kit – 540 ul vs ZyBio 200 ul), we can see that the results are in relative agreement with the exception of adenovirus (as DNA virus). The commercial assay for SARS-CoV-2 detection, which is the major use of ZyBio system in our lab, has the RNA as internal control and in the performed test we can see wonderful homogeneity of internal controls signals throughout the tested plates. As conclusion - for extraction and detection of RNA viruses is ZyBio EMX3000 extraction system in our hands very useful, quick and suitable device.

Petr Hubacek, M.D., Ph.D.
Laboratory of Virology

ICP 05 002 174
 Dept. of Medical Microbiology
 Motol University Hospital
 Přednosta: Prof. MUDr. Pavel Dřevínek, Ph.D.
 Primář: MUDr. Otakar Alvič, Ph.D.
 odbornost: 802
 IČO: 00064203 DiČ: CZ00064203
 Date: 19.11.2020