CAMO (COMPARING ANIMAL MODELS TO ORGANOIDS) - TESTING MEDICAL COUNTERMEASURES WITH MICROPHYSIOLOGICAL SYSTEMS AND COMPARING TO TRADITIONAL ANIMAL MODELS AND CLINICAL TRAILS

Viral Infection And Antiviral Drug Efficacy Evaluation Using Organoids Platform

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Background and Aims: Organoids can be defined as three-dimensional cell aggregates formed through self-renewal, differentiation, and self-organization from embryonic stem cells, adult stem cells, and induced pluripotent stem cells. They are called mini-organs or organ analogs and have a structure and function like actual organs. Recently, research using organoid models that can simulate human organs and diseases is rapidly developing, and studies are underway to apply these organoids to pathogen research and drug screening analysis platforms. In this study, we would like to introduce the results of evaluating the efficacy of viral infection and viral treatment using organoids.
Methods: Each of three types of single organoids (brain, lung, kidney) were infected with viruses to observe susceptibility, and efficacy evaluations were conducted on various antiviral drug candidates. After treating the virus-infected organoid with the antiviral drug, the efficacy was observed using real-time PCR and confocal imaging methods.
Results: As a result of infecting a single organoid with five viruses, brain organoids were most susceptible to infection, and in the case of HTNV and SARS-CoV-2, susceptibility was observed in lung and kidney organoids. As a result of antiviral drug efficacy evaluation, it was confirmed that the viral titer was reduced in the therapeutic antibody platform.
Conclusion: In this study, the possibility of evaluating viral infection and antiviral drug efficacy using single organoid was confirmed. In the future, we plan to conduct research to develop an organoid-based antiviral drug efficacy evaluation platform using more diverse methods.