

Mar 19, 2025

Calculating Multiplicity of Infection (MOI)

DOI

<https://dx.doi.org/10.17504/protocols.io.rm7vzj1wrlx1/v1>

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Protocol Citation: Briana McGovern, Kris White 2025. Calculating Multiplicity of Infection (MOI). protocols.io
<https://dx.doi.org/10.17504/protocols.io.rm7vzj1wrlx1/v1>

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Protocol status: Working

We use this protocol and it's working

Created: August 07, 2024

Last Modified: March 19, 2025

Protocol Integer ID: 104826

Keywords: MOI, infection, antiviral, analysis, ideal moi for antiviral screening, multiplicity of infection, calculating multiplicity, ratio of viral particle, multiplicity, ideal mois, antiviral screening, viral particle, mois, infection, amount of cell, virus

Funders Acknowledgements:

National Institutes of Health/National Institute Of Allergy and Infectious Diseases (NIH/NIAID)

Grant ID: U19AI171399

Abstract

Multiplicity of infection (MOI) is the ratio of viral particles to cells. The ideal MOI for antiviral screenings will depend on several things - the cell type, the cell passage, the virus type, the amount of cells, etc.

Before start

The appropriate MOI for antiviral screenings will depend on several factors - the cell type, the cell passage, the amount of cells, the virus type, etc.

We always run an MOI test, which is an MOI dilution series, when we create fresh cell or virus stocks. From this MOI test we select the MOI that achieves approximately 30% infectivity.



1



Virus Dilution Calculator (1).xlsx 10.6KB

Use this excel sheet for quick MOI dilution calculation.

2

Or if you would prefer to perform by hand:

1. desired MOI x (# cells / well) = **Plaque Forming Units (PFU)/well**

2. (PFU/well) x (1000/50) = PFU/ml needed

3. (stock titer) / (PFU/ml needed) = Dilution Factor

4. ((5ml x # plates)(1000)) / DF = total volume of virus stock needed

5. (5ml) - (volume of virus stock) = amount of 2% media for the dilution

For example,

our current stock of SARS-CoV-2 WA1 has a titer of 3.5e6 PFU/ml

we want to infect the wells with MOI 0.05

we have 5 plates and we want to infect wells with 50ul volume (~estimate 5ml volume needed per plate)

$0.05 (1.6e4 \text{ cells/well}) = 800 \text{ PFU/well}$

$800 (1000/50) = 16,000 \text{ PFU/ml}$

$(3.5e6)/16,000 = 218.75$

$((1000(5\text{ml} \times 5 \text{ plates})) / 218.75 = 114.29 \text{ ul SARS-CoV-2 WA1 virus stock needed}$

$5\text{ml} - 114.29\text{ul} = 4,885.7 \text{ ul } 2\% \text{ Media}$