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## Introduction

- Cytomegalovirus (CMV) is a Herpesvirus
- Have virus for life
- Minor symptoms typically
- Can cause death in immunocompromised
- A leading cause of sensorineural hearing loss in infants
- Currently treated by Ganciclovir (GCV)
  - Highly cytotoxic
  - Concerning side effects in mice
- Recent studies show GCV dosing can be lowered by using Quercetin Poloxamer 188 (QP188)
- Used Neutral Red(NR) assay to measure cytotoxicity of QP188 and GCV
- While using NR assay, high error values were found.

## Methods

### Quercetin Degradation

Batches of QP188 were prepared through thin-film hydration. The solutions were then diluted. Absorbance scans were taken of the mixture every day for two weeks.

# Confidence increased in the antiviral efficacy of excipients against Cytomegalovirus.

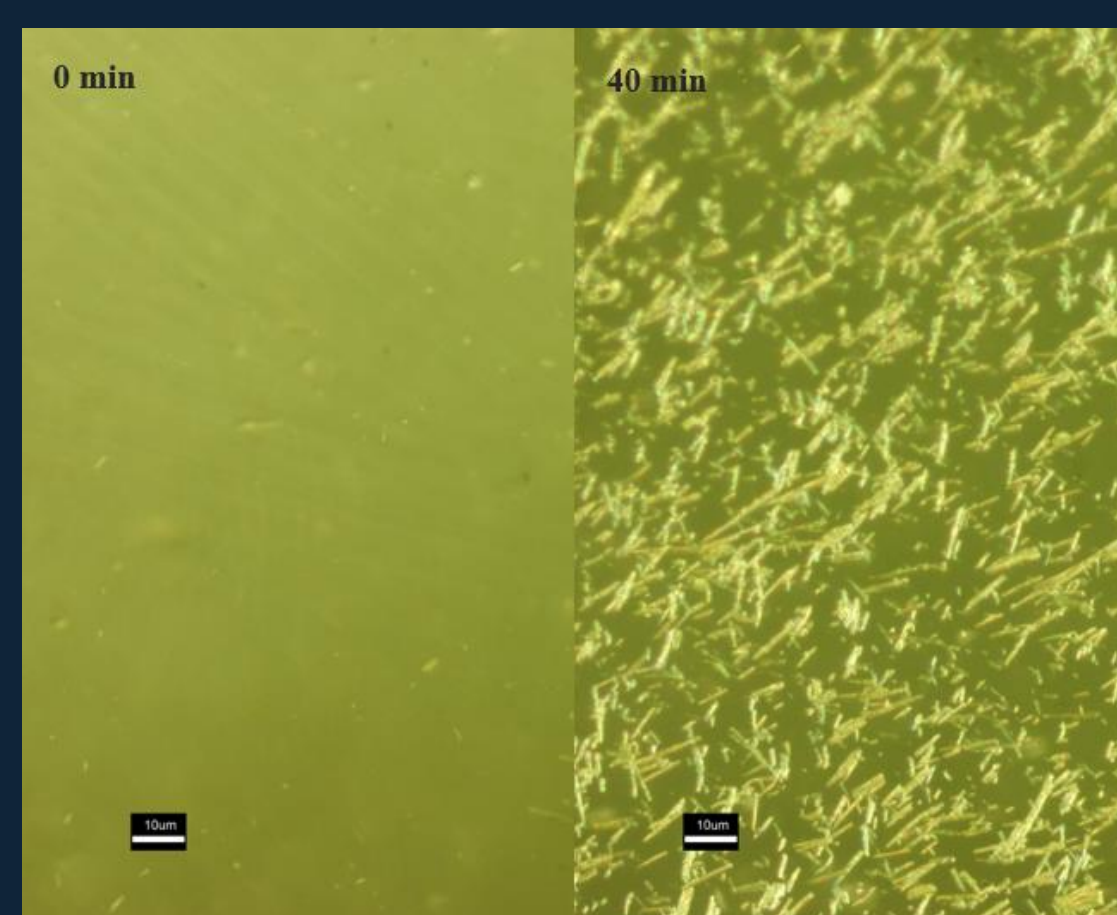


Figure 1: Microscopic images of quercetin solution at 0 minutes and 40 minutes.

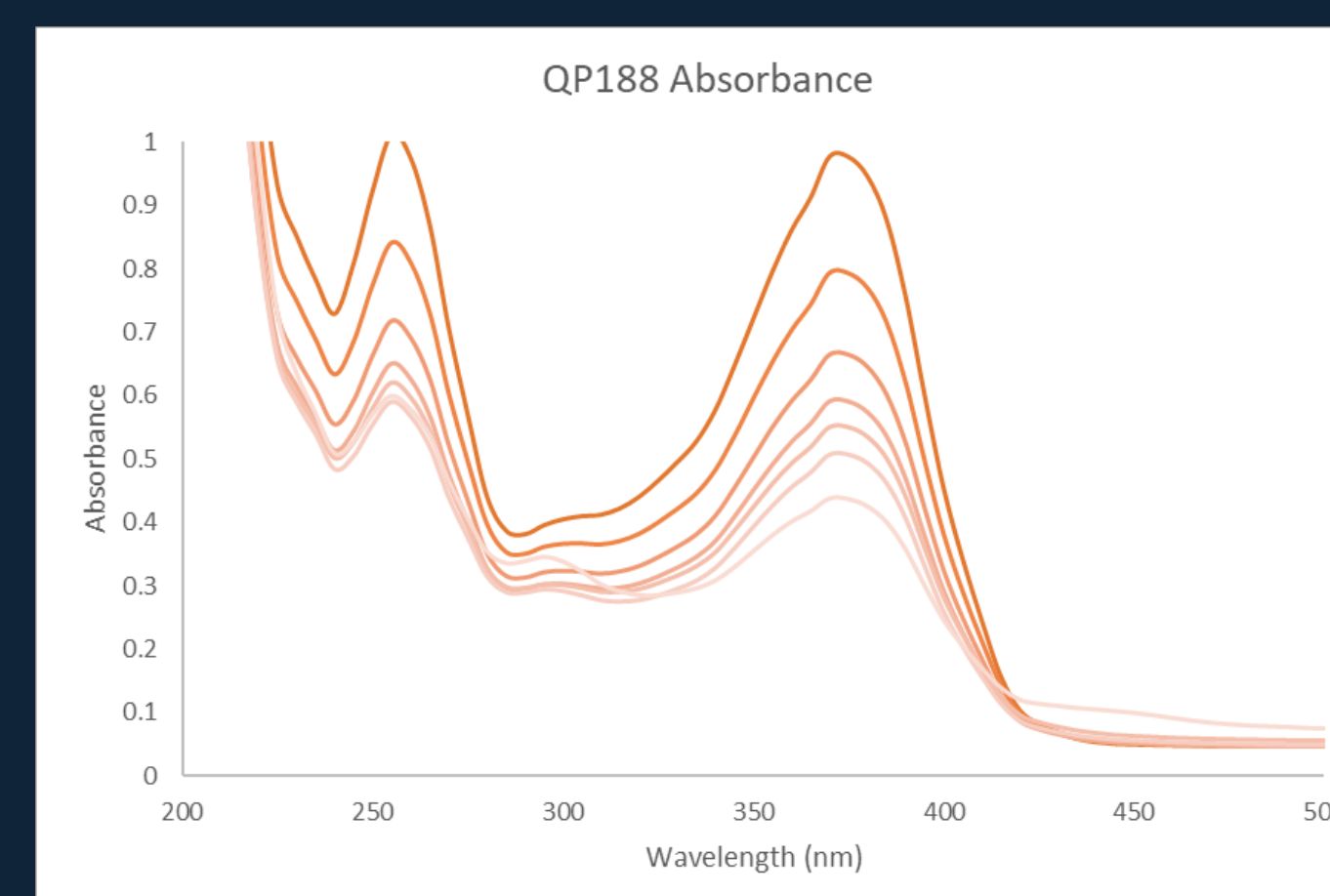


Figure 2: Absorbance scans of QP188 taken daily for two weeks.

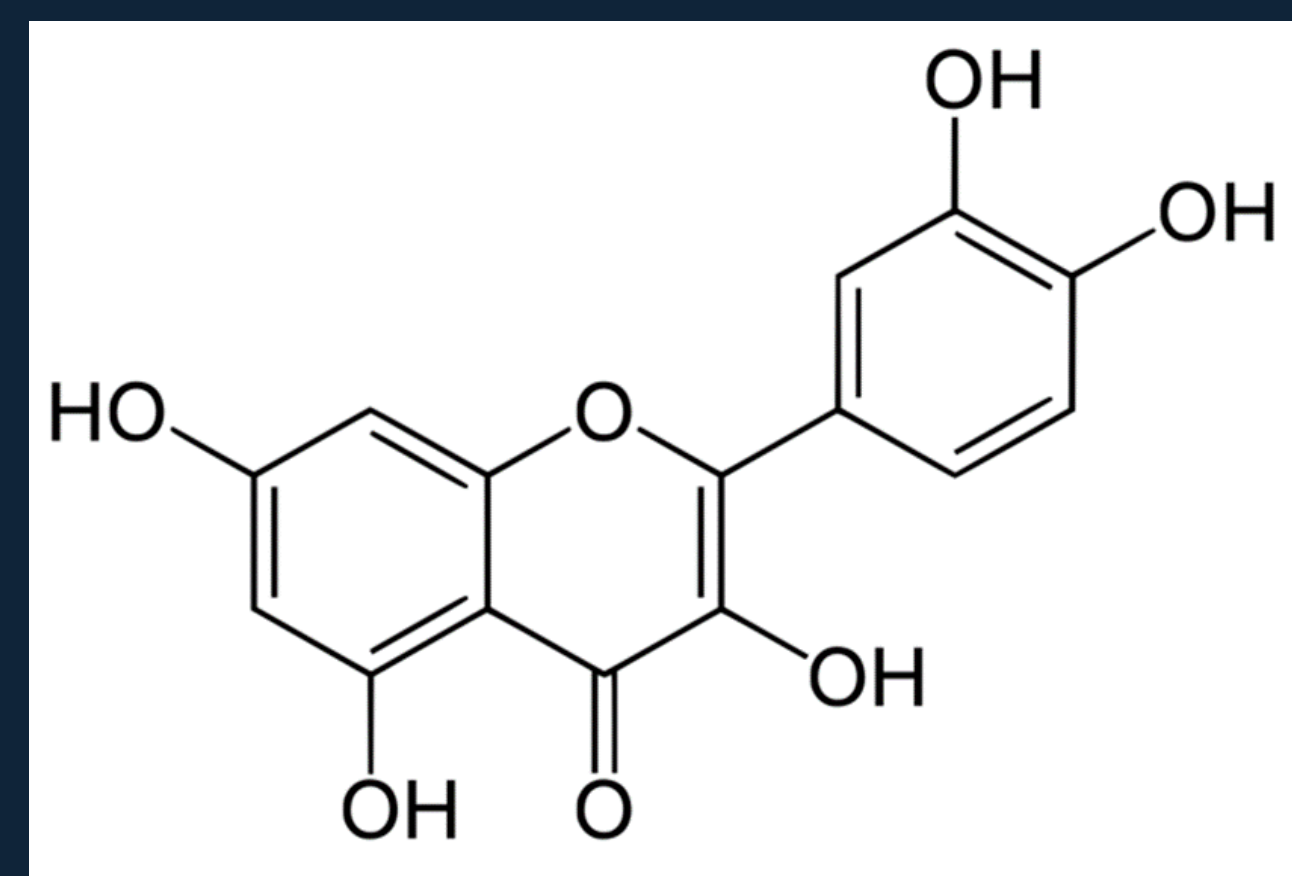


Figure 3: Molecular Formula of Quercetin

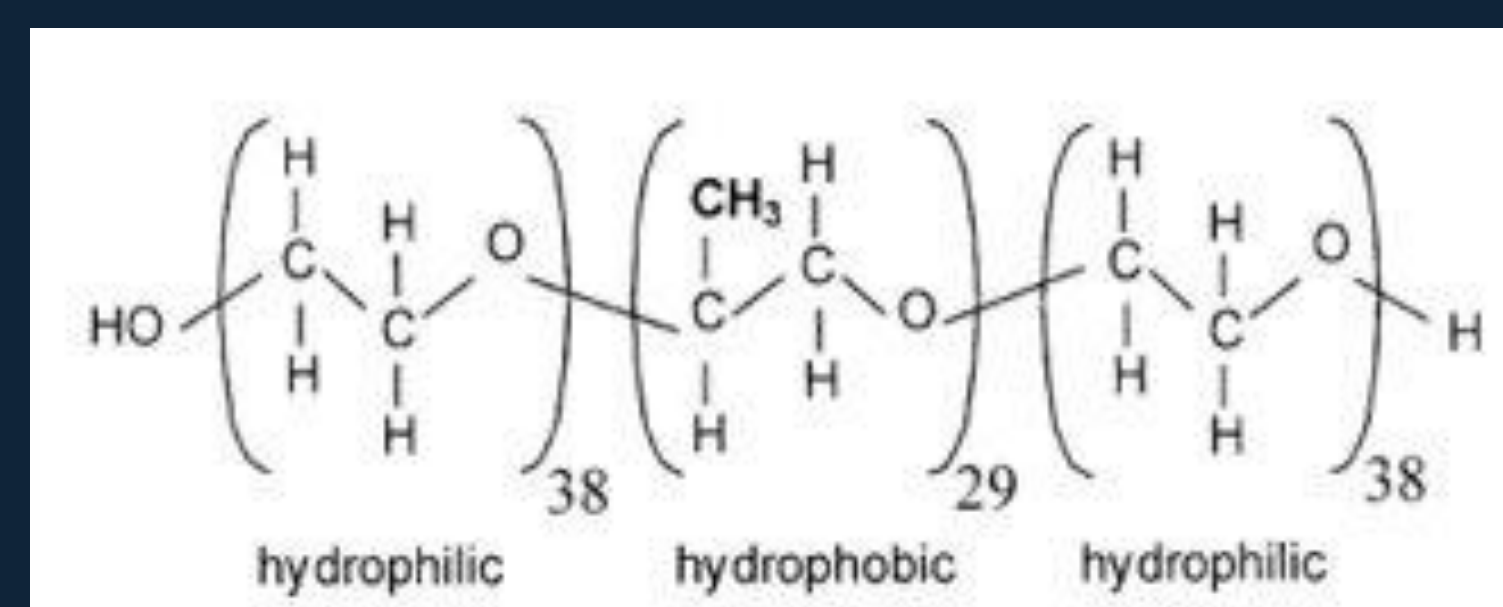


Figure 4: Molecular Formula of P188



Figure 5: Molecular Formula of GCV

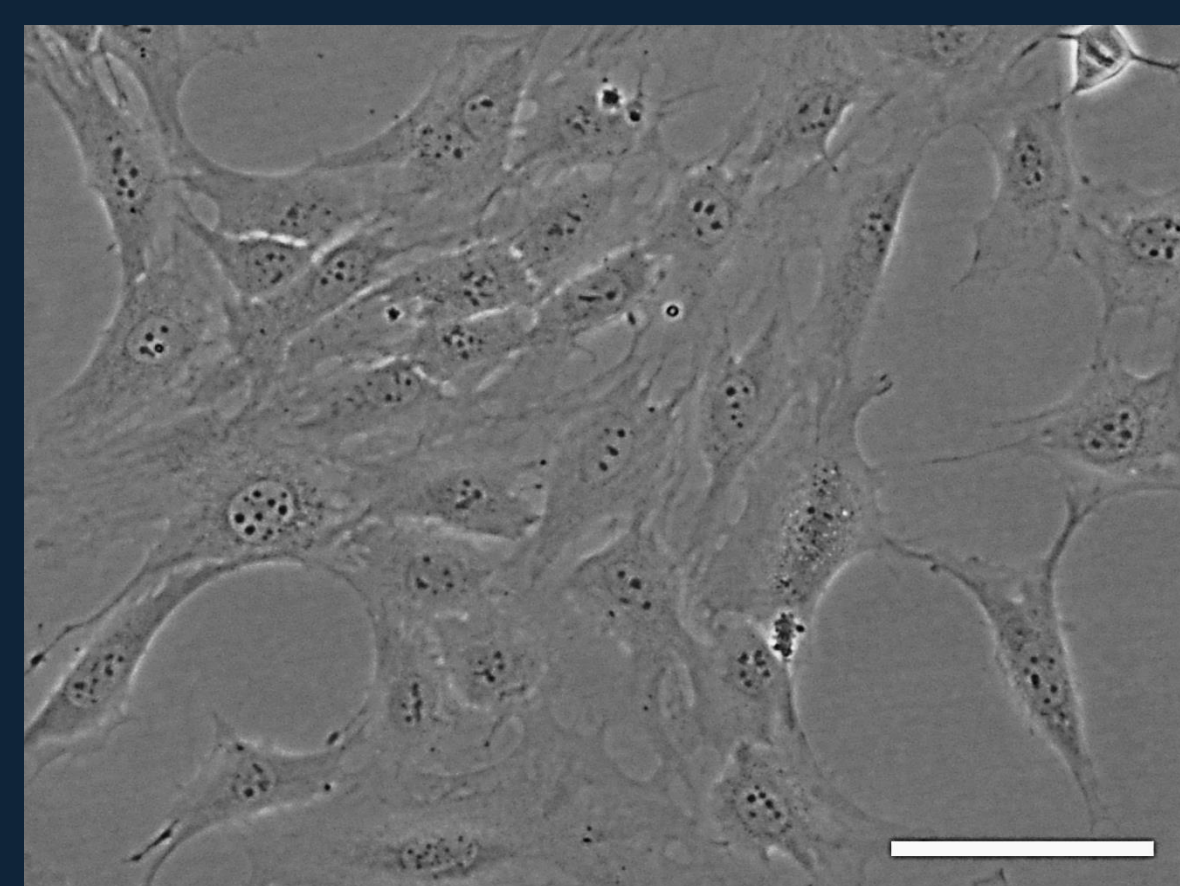


Figure 6: 3T3 Mouse Fibroblast cells after a period of Normal Cell growth. Scale bar is 10  $\mu$ m

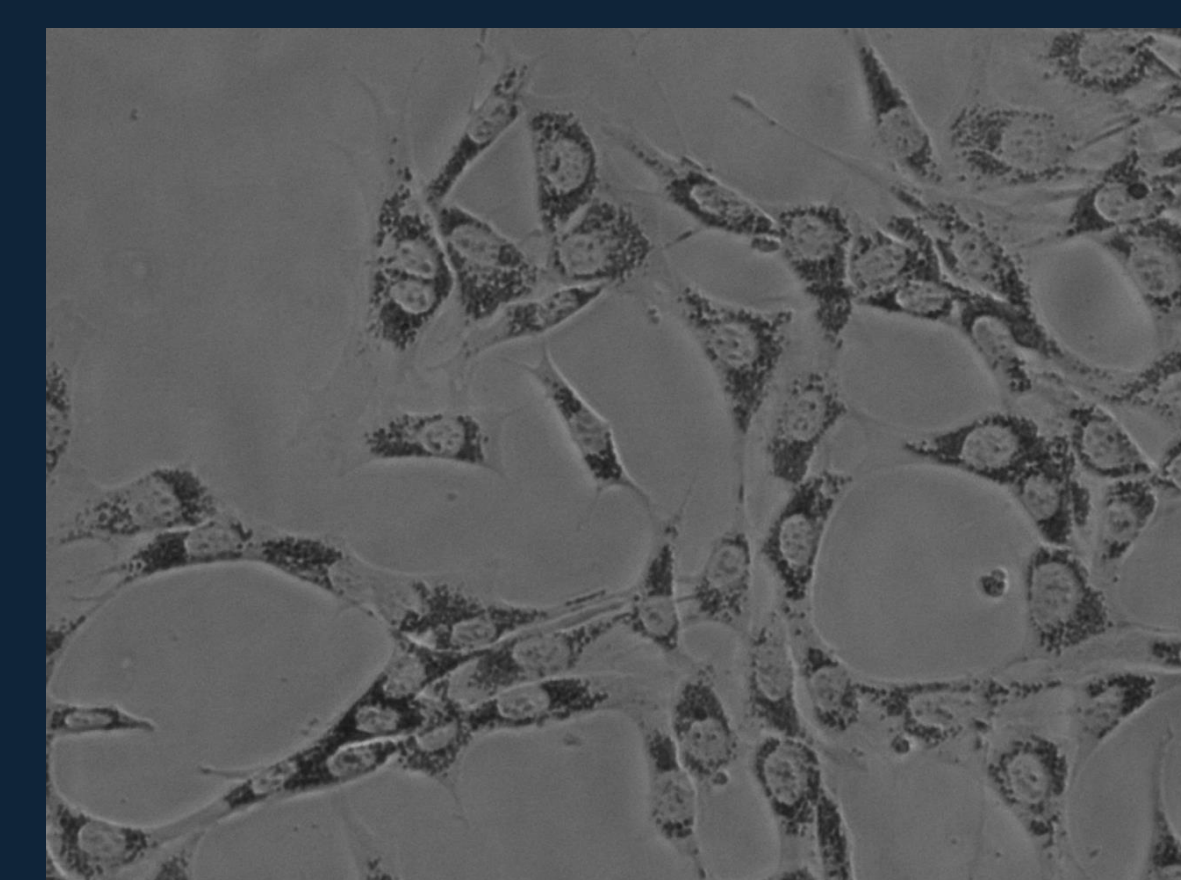
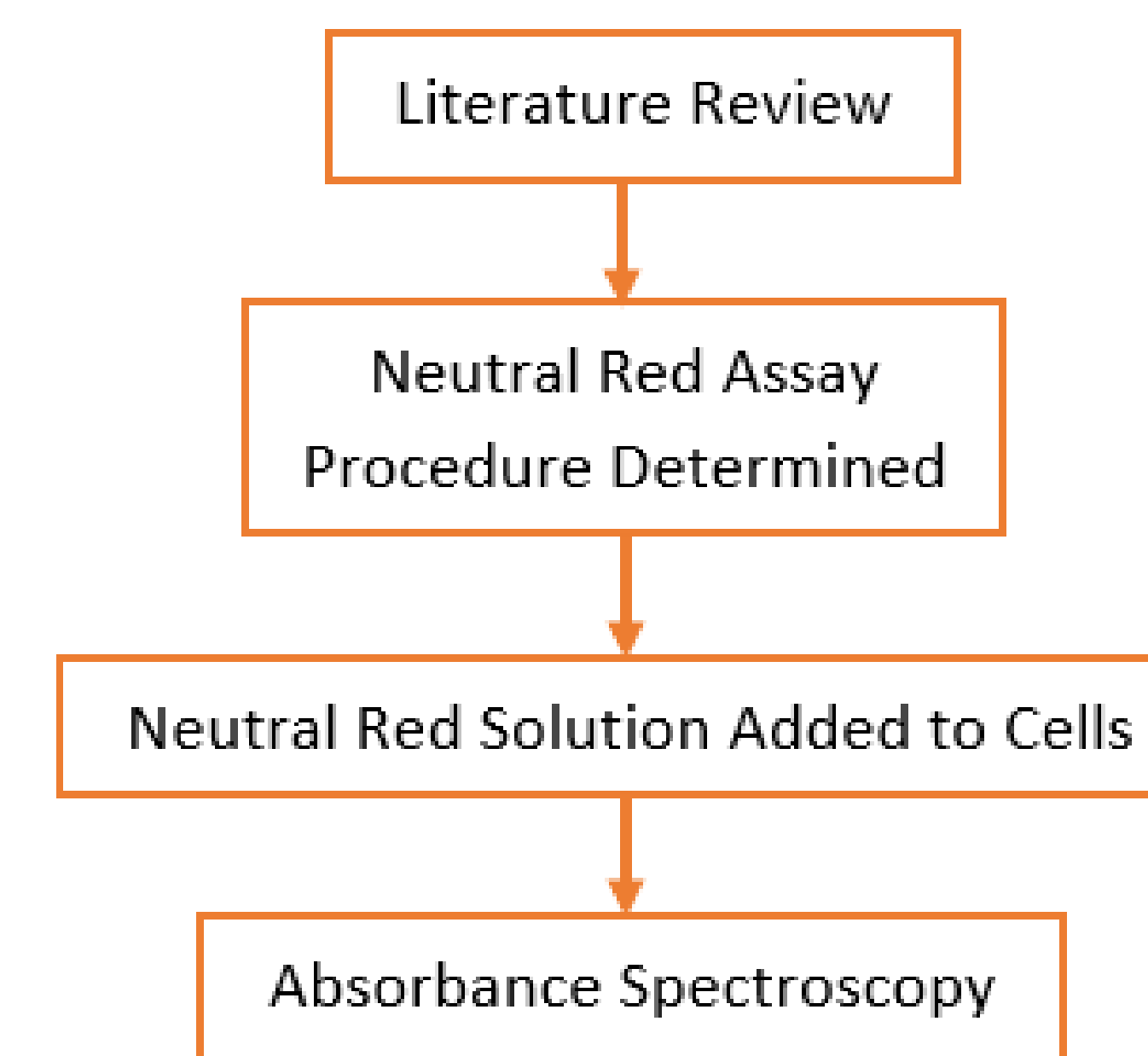


Figure 7: 3T3 Mouse Fibroblast cells after taking up Neutral Red dye.

## Methods (Continued)



## Results

### Quercetin Degradation

The intensities of the absorbances decreased with each measurement taken, which indicates that quercetin drops out of solution at low concentrations. No new peaks were observed until day 15 at the earliest indicating quercetin does not significantly oxidize in the presence of P188 until after 2 weeks. These findings informed how often QP188 should be formulated to support an animal study performed with the University of Utah

### Neutral Red Assay

- Cells successfully took up NR dye
- Cells maintained morphology
- Mean absorption: 0.0747
- Standard Deviation between wells 0.0061

## Next Steps

- Respond to what we will learn in our animal model with the University of Utah
- What excipients can we include besides or in addition to QP188?
- How can we take advantage of the way CMV affects the cell cycle?



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