FRAP Analysis Report

Fluorescence Recovery After Photobleaching

Samples: 100 uM OA + SCDi vs SCDi

Date: December 12, 2025

Executive Summary

This report presents FRAP analysis comparing two treatment conditions: 100 uM Oleic Acid + SCDi and SCDi alone.

Key Findings

1. Recovery Kinetics: SCDi alone shows slower recovery (t1/2 = 1.31s) compared to 100 uM OA + SCDi (t1/2 = 0.60s), representing a ~2.2x difference.

2. Mobile Fractions: Both treatments show similar mobile fractions (~55%).

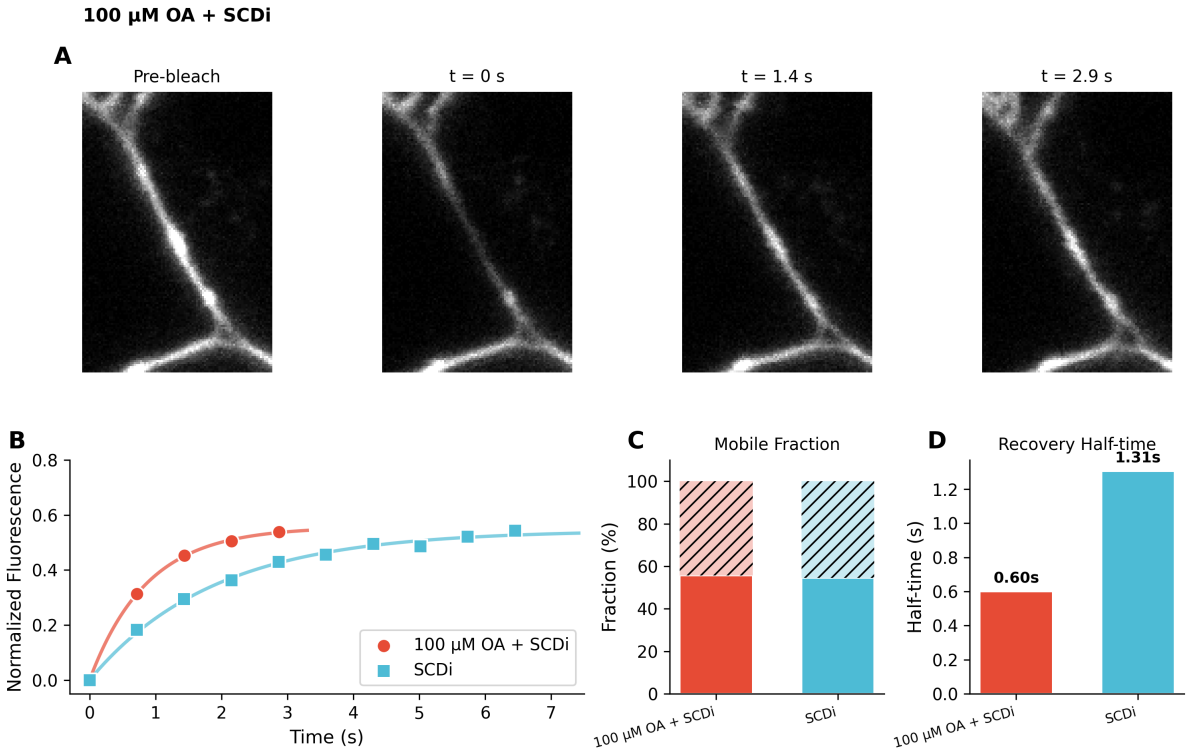
3. Model Fit: Single exponential provides excellent fits (R2 > 0.99).

Summary Statistics

Parameter	100 uM OA + SCDi	SCDi	Difference
Mobile Fraction (%)	55.6	54.5	-1.2
Half-time t1/2 (s)	0.601	1.306	0.705
Time Constant tau (s)	0.867	1.884	1.017
R-squared	0.9998	0.9962	-

Figures

Figure 1: Main Publication Figure



E

Parameter	100 µM OA + SCDi	SCDi	Units
Mobile Fraction	55.6	54.5	%
Immobile Fraction	44.4	45.5	%
Time Constant (τ)	0.867	1.884	s
Half-time (t½)	0.601	1.306	s
R²	0.9998	0.9962	

F

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Methods Summary:

• Normalization: Double normalization
• Curve fitting: Single exponential
  F(t) = Mf × (1 - e^(-t/τ))
• Half-time: t½ = τ × ln(2)
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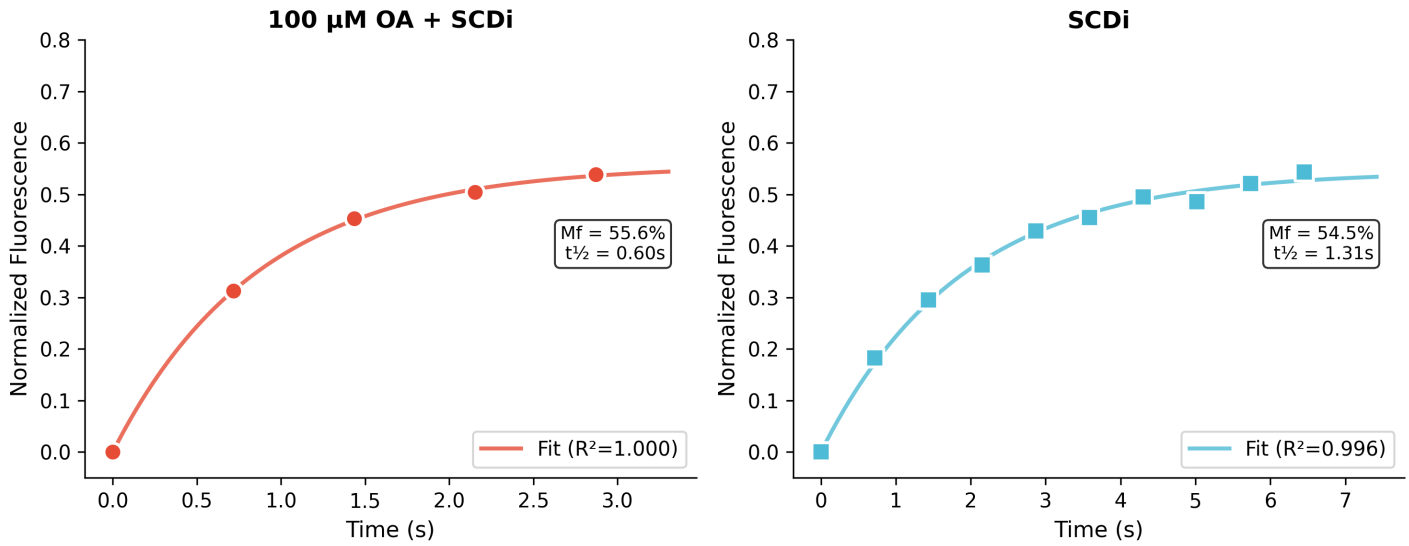
Figure 1. FRAP analysis of 100 uM OA + SCDi and SCDi treatments. (A) Representative images. (B) Recovery curves. (C) Mobile fractions. (D) Half-times. (E) Summary statistics.

Figure S1: Individual Recovery Curves



Conclusions

This FRAP analysis reveals distinct molecular dynamics between treatments:

1. SCDi alone results in slower fluorescence recovery (t1/2 = 1.31s) compared to 100 uM OA + SCDi (t1/2 = 0.60s).

2. Both treatments show similar mobile fractions (~55%).

3. The faster recovery with OA + SCDi suggests oleic acid may increase molecular mobility despite SCD inhibition.