



Universiteit  
Leiden  
The Netherlands

## **The relation between dynamics and activity of phospholipase A/acyltransferase homologs**

Chatterjee, S.D.

### **Citation**

Chatterjee, S. D. (2022, March 2). *The relation between dynamics and activity of phospholipase A/acyltransferase homologs*. Retrieved from <https://hdl.handle.net/1887/3277998>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3277998>

**Note:** To cite this publication please use the final published version (if applicable).

# The relation between dynamics and activity of phospholipase A/acyltransferase homologs.

Proefschrift

ter verkrijging van  
de graad van doctor aan de Universiteit Leiden,  
op gezag van rector magnificus prof.dr.ir. H. Bijl,  
volgens het besluit van het college voor promoties  
te verdedigen op 2 maart 2022  
klokke 13:45 uur

door

**Soumya Deep Chatterjee**  
Geboren te Siliguri, India

in 1990

Promotores:

Prof. dr. Marcellus Ubbink

Prof. dr. Mario van der Stelt

Promotiecommissie:

Prof. dr. H.S. Overkleeft

Prof. dr. A. Kros

Prof. dr. J.M.F.G. Aerts

Dr. J. Vreede (University of Amsterdam)

Dr. M. Tessari (Radboud University Nijmegen)

# Table of Contents

<b>Chapter 1</b> Introduction	6-27
<b>Chapter 2</b> Sub-second $^{15}\text{N}$ backbone dynamics reveal differences between PLAAT3 and PLAAT4	29-64
<b>Chapter 3</b> Molecular dynamics simulations reveal loop rearrangements in PLAAT4	66-83
<b>Chapter 4</b> Introduction of the PLAAT4 L2(B6) in PLAAT3 disrupts salt bridges and increases activity	85-102
<b>Chapter 5</b> Removal of slow-pulsing artifacts in in-phase $^{15}\text{N}$ relaxation dispersion experiments using broadband $^1\text{H}$ decoupling	104-124
<b>Chapter 6</b> General Discussion	126-131
<b>Summary</b>	132-137
<b>Curriculum Vitae</b>	138
<b>List of Publications</b>	138

## Abbreviations

CPD	Composite pulse decomposition
CPMG	Carr-Purcell-Meiboom-Gill
CW	Continuous wave
LRAT	Lecithin: retinol acyltransferases
MD	Molecular dynamics
NAE	<i>N</i> -acylethanolamine
NAPE	<i>N</i> -acyl phosphatidyl ethanolamine
NMR	Nuclear magnetic resonance
PC	Phosphatidylcholine
PE	Phosphatidylethanolamine
PLAAT	Phospholipase A/acyltransferase
ppm	Parts per million
RMSD	Root mean square deviation
ST	Single train
TROSY	Transverse relaxation optimized spectroscopy