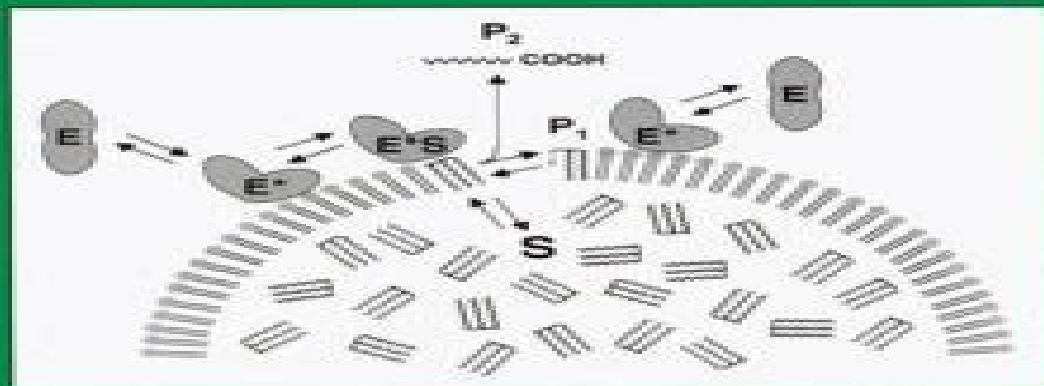


Methods in Molecular Biology

VOLUME 109

# Lipase and Phospholipase Protocols

*Edited by*  
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# Lipase And Phospholipase Protocols

**Steven K. Chapman, Graeme A. Reid**



## **Lipase And Phospholipase Protocols:**

Lipase and Phospholipase Protocols Mark Doolittle, 2008-02-02 The lipases and phospholipases represent a diverse group of enzymes that are expressed in animals plants fungi and bacteria Their ubiquitous distribution among all species is a testament to the essential roles played by these enzymes in lipid storage mobilization and metabolism membrane homeostasis and remodeling endocrine and immune functions and signal transduction In humans lipases and phospholipases are also thought to contribute to complex diseases such as atherosclerosis obesity arthritis and cancer as well as to single gene defects such as Wolman's disease and Type I hyperlipoproteinemia Enzymatically the lipases are unique since they hydrolyze substrates that are either insoluble or only partly soluble in aqueous solvents thus enzyme catalysis takes place at a lipid water interface The interface comprises at least two and often more discrete bulk and surface phases in which the enzyme substrate and products of lipolysis disperse among these phases based on their physical properties Furthermore the distribution of these components changes continuously as lipolysis proceeds Thus the lipases and phospholipases are fundamentally different from any other enzyme because of the physical complexity of the environment in which catalysis occurs

**Lipases and Phospholipases in Drug Development** Günter Müller, Stefan Petry, 2006-03-06 Lipases and Phospholipases are key control elements in mammalian metabolism They share many common features that set them apart from other metabolic enzyme classes most importantly their association with biological membranes Their potential as drug targets for the treatment of metabolic diseases is widely recognized and the first lipase inhibitor drugs have been successfully introduced Providing drug developers with a firm foundation for lipase centered drug design the editors of this volume have assembled experts from different scientific disciplines to create a comprehensive handbook for all pharmaceutical chemists biochemists and physiologists working with lipases The authors examine fundamental aspects of lipase function in vitro and in vivo explaining how this knowledge may be used to develop lipase assays They also treat the physiological roles of lipases in normal and disordered metabolism as well as strategies to target lipases for the treatment of diabetes obesity and related disorders Additional topics include the application of phospholipases for liposome based drug delivery and their use as diagnostic tools

**Lipases and Phospholipases** Georgina Sandoval, 2019-12-10 This volume provides an essential update on fundamental issues current and new applications as well as practical protocols to explore the extensive applications of lipases and the potential application of phospholipases After an overview the book delves into activity screening and expression optimization of the biocatalyst production and performances and applications of lipases phospholipases and esterases Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and accessible Lipases and Phospholipases Methods and Protocols Second Edition serves as an updated reference book for the large scientific community

both seasoned and novice working with lipases phospholipases and related enzymes      **Adipose Tissue Protocols** Gérard Ailhaud, 2008-02-03 Adipose tissue is recognized to be exquisitely sensitive to hormone action and is also now recognized as a secretory and endocrine organ required for reproduction and good health Adipocytes are smart cells able within the tissue to communicate with surrounding cells but also with various organs particularly via leptin acting on the central nervous system Brown adipose tissue BAT and white adipose tissue WAT are known to be distinct tissues whereas the heterogeneity of WAT depots is well established Unfortunately excess WAT leads to obesity which is the most common health problem in industrialized countries Therefore from both a scientific and a technical point of view the time has come to create a survey of adipose tissues and their neglected adipocytes In Adipose Tissue Protocols I have attempted to gather together chapters from all areas of adipose tissue research from in vivo to in vitro studies and to provide methods covering a wide variety of techniques including the choice of adipose tissue depot and of morphological techniques for the study of BAT and WAT the isolation subcellular fractionation and transfection of adipocytes where the low density of these cells must be taken into account assays of nutrient and ion fluxes and the metabolic aspects of nutrient uptake assays of lipid related enzymes biopsies and quantification of lipid related mRNAs cultures of adipose precursor cells from WAT and BAT of various species including human tissue measurements of adipose secretory products and assessment of WAT metabolism in vivo

Phospholipases in Physiology and Pathology Sajal Chakraborti, 2023-08-17 Phospholipases in Physiology and Pathology presents a comprehensive overview on the physiology and pathology of phospholipases This seven volume set considers the biochemical and molecular mechanisms of normal and abnormal cell function upon dysregulation of phospholipases in different diseases Volumes cover signal transduction mechanisms implications in cancer infectious diseases neural diseases cardiovascular diseases and other diseases implications in inflammation apoptosis gene expression and non coding RNAs the role of natural and synthetic compounds and stem cell therapies nanotechnology based therapies and more Together these volumes give researchers critical insight on the mechanistic and therapeutic aspects of phospholipases Discusses the biochemical and molecular mechanisms of normal and abnormal cell function in different disease processes Covers a wide range of basic and translational research appropriate for scientists engaged in studying the regulation of phospholipases from interdisciplinary perspectives Features state of the art chapter contributions from international leaders in the field

*Unique Sequence Signatures in Plant Lipolytic Enzymes: Emerging Research and Opportunities* Ben Halima, Nihed, 2018-12-04 Lipids are biomolecules that constitute a significant amount of biomass in the earth and plant lipids are rapidly growing in interest due to their roles in improving food technology medicine nutrition and biotechnology With recent advances in protein chemistry biochemistry and enzymology promoting research on lipolytic enzymes it is important for research to address the mechanisms of such enzymes and their diverse functions Unique Sequence Signatures in Plant Lipolytic Enzymes Emerging Research and Opportunities provides innovative insights into the biochemistry of plant lipases

and phospholipases as well as their structures and catalytic mechanisms The book explores the conserved domains and motifs of plant lipolytic enzymes by identifying the main residues involved in the catalysis in the enzymes and the phylogeny of important plant lipolytic enzymes as well as calculating the evolutionary distance in those enzymes Organized into six chapters it is a vital reference source for researchers chemists biologists academicians practitioners medical professionals engineers and graduate students

**Handbook of Dairy Foods Analysis** Fidel Toldrá, Leo M.L. Nollet, 2021-03-29 Dairy foods account for a large portion of the Western diet but due to the potential diversity of their sources this food group often poses a challenge for food scientists and their research efforts Bringing together the foremost minds in dairy research Handbook of Dairy Foods Analysis Second Edition compiles the top dairy analysis techniques and methodologies from around the world into one well organized volume Exceptionally comprehensive in both its detailing of methods and the range of dairy products covered this handbook includes tools for analyzing chemical and biochemical compounds and also bioactive peptides prebiotics and probiotics It describes noninvasive chemical and physical sensors and starter cultures used in quality control This second edition includes four brand new chapters covering the analytical techniques and methodologies for determining bioactive peptides preservatives activity of endogenous enzymes and sensory perception of dairy foods and all other chapters have been adapted to recent research All other chapters have been thoroughly updated Key Features Explains analytical tools available for the analysis of the chemistry and biochemistry of dairy foods Covers a variety of dairy foods including milk cheese butter yogurt and ice cream Analysis of nutritional quality includes prebiotics probiotics essential amino acids bioactive peptides and healthy vegetable origin compounds Includes a series of chapters on analyzing sensory qualities including color texture and flavor Covering the gamut of dairy analysis techniques the book discusses current methods for the analysis of chemical and nutritional compounds and the detection of microorganisms allergens contaminants and or other adulterations including those of environmental origin or introduced during processing Other methodologies used to evaluate color texture and flavor are also discussed Written by an international panel of distinguished contributors under the editorial guidance of renowned authorities Fidel Toldrá and Leo M L Nollet this handbook is one of the few references that is completely devoted to dairy food analysis an extremely valuable reference for those in the dairy research processing and manufacturing industries

*Molecular Methods in Developmental Biology* Matt Guille, 2008-02-03 The process whereby a single cell the fertilized egg develops into an adult has fascinated for centuries Great progress in understanding that process has ever been made in the last two decades when the techniques of molecular biology have become available to developmental biologists By applying these techniques the exact nature of many of the interactions responsible for forming the body pattern are now being revealed in detail Such studies are a large and it seems ever expanding part of most life science groups It is at newcomers to this field that this book is primarily aimed A number of different plants and animals serve as common model organisms for developmental studies In *Molecular Methods in*

Developmental Biology Xenopus and Zebrafish a range of the molecular methods applicable to two of these organisms are described these are the South African clawed frog *Xenopus laevis* and the zebrafish *Brachydanio rerio* The embryos of both of these species develop rapidly and externally making them particularly suited to investigations of early vertebrate development However both *Xenopus* and zebrafish have their own advantages and disadvantages *Xenopus* have large robust embryos that can be manipulated surgically with ease but their pseudotetraploidy and long generation time make them unsuitable candidates for genetics This disadvantage may soon be overcome by using the diploid *Xenopus tropicalis* and early experiments are already underway The transparent embryos of zebrafish render them well suited for in situ hybridization and immunohistochemistry and good for observing mutations in genetic screens

*Receptor Binding Techniques* Mary

Keen, 1999 This cutting edge collection of step by step experimental protocols demonstrates **Flavoprotein Protocols**

Steven K. Chapman, Graeme A. Reid, 2008-02-03 As a scientist with an interest in proteins you will at some time in your career isolate an enzyme that turns out to be yellow or perhaps you already have Alternatively you may identify a polypeptide sequence that is related to known flavin containing proteins This may or may not be your first encounter with flavoproteins However even if you are an old hand in the field you may not have exploited the full range of experimental approaches applicable to the study of flavoproteins We hope that *Flavoprotein Protocols* will encourage you to do so In this volume we have sought to bring together a range of experimental methods of value to researchers with an interest in flavoproteins whether or not these researchers have experience in this area A broad range of techniques from the everyday to the more specialized is described by scientists who are experts in their fields and who have extensive practical experience with flavoproteins The wide range of approaches from wet chemistry to dry computation has as a consequence demanded a range of formats Where appropriate particularly for analytical methods the protocol described is laid out in easy to follow steps In other cases e.g. the more advanced spectroscopies and computational methods it is far more apt to describe the general approach and relevance of the methods We hope this wide ranging approach will sow the seeds of many future collaborations between laboratories and further our knowledge and understanding of how flavoproteins work **Supramolecular Structure**

**and Function** 7 Greta Pifat-Mrzljak, 2012-12-06 This volume represents a collection of lectures delivered by outstanding specialists in the fields of biophysics and of related scientific disciplines during the 7 International Summer School on Biophysics held in Rovinj Croatia from 14 to 25 September 2000 under the title *Supramolecular Structure and Function* This scientific educational event was organized by the Ruder Boskovic Institute of Zagreb Croatia with substantial material and intellectual support of a number of national and international institutions including the Croatian Biophysical Society CBS the International Union of Pure and Applied Biophysics IUPAB the International Centre for Genetic Engineering and Biotechnology ICGB and the UNESCO Venice Office Regional Office for Science and Technology for Europe UVO ROSTE The seventh edition of the series of International Summer Schools on Biophysics which was started in 1981 attracted more

than 120 young researchers and post graduate students coming from 27 countries of Europe Asia Africa and Latin America Twenty five outstanding experts in pure and applied biophysics presented the most advanced knowledge of this very interdisciplinary area of science during their lectures and round tables It was commonly acknowledged that the Summer School achieved great success and fully reached its objectives The success of the Rovinj Summer School was also due to the constantly growing attention being paid by scientific communities to younger generations of scientists thanks also to the major outcomes of the World Conference on Science Science for the Twenty first Century A New Commitment held by UNESCO and ICSU in Budapest Hungary in June 1999

**Methods in Molecular Biology: Lipase and phospholipase protocols** John M. Walker, 1984 **Mass Spectrometry of Proteins and Peptides** John R. Chapman, 2008-02-05 Little more than three years down the line and I am already writing the Preface to a second volume to follow Protein and Peptide Analysis by Mass What has happened in between these times to make this second venture worthwhile New types of mass spectrometric instrumentation have appeared so that new techniques have become possible and existing techniques have become much more feasible More particularly however the newer ionization techniques introduced for the analysis of high molecular weight materials have now been thoroughly used and studied As a result there has been an enormous improvement in the associated sample handling technology so that these methods are now routinely applied to much smaller sample amounts as well as to more intractable samples Again this particular community of mass spectrometry users has both increased in number and diversified And riding this wave of acceptance leaders in the field have set their sights on more complex problems molecular interaction ion structures quantitation and kinetics are just a few of the newer areas reported in Mass Spectrometry of Proteins and Peptides As with the first volume one purpose of this collection Mass Spectrometry of Proteins and Peptides is to show the reader what can be done by the application of mass spectrometry and perhaps even to encourage the reader to venture down new paths

**Current Developments in Biotechnology and Bioengineering** Amit Kumar Rai, Sudhir P. Singh, Ashok Pandey, Christian Larroche, Carlos Ricardo Soccol, 2021-11-30 Approx 438 pages Approx 438 pages *Lipid Modification by Enzymes and Engineered Microbes* Uwe T. Bornscheuer, 2018-03-27 Lipid Modification by Enzymes and Engineered Microbes covers the state of the art use of enzymes as natural biocatalysts to modify oils also presenting how microorganisms such as yeast can be designed In the past ten years the field has made enormous progress not only with respect to the tools developed for the development of designer enzymes but also in the metabolic engineering of microbes the discovery of novel enzyme activities and in reaction engineering process development For the first time these advances are covered in a single volume that is edited by leading enzymatic scientist Uwe Bornscheuer and authored by an international team of experts Identifies how and when to use enzymes and microbes for lipid modification Provides enzymatic microbial and metabolic techniques for lipid modification Covers lipases acyltransferases phospholipases lipoxygenases monooxygenases isomerases and sphingolipids Includes lipid modification for use in food biofuels oleochemicals and polymer

precursors      **Industrial Enzyme Applications** Andreas Vogel, Oliver May, 2019-07-03 This reference is a must read It explains how an effective and economically viable enzymatic process in industry is developed and presents numerous successful examples which underline the efficiency of biocatalysis      **Handbook of Food Analytical Chemistry, Volume 1** Ronald E. Wrolstad, Terry E. Acree, Eric A. Decker, Michael H. Penner, David S. Reid, Steven J. Schwartz, Charles F. Shoemaker, Denise M. Smith, Peter Sporns, 2005-09-02 Emphasizing effective state of the art methodology and written by recognized experts in the field the Handbook of Food Analytical Chemistry is an indispensable reference for food scientists and technologists to enable successful analysis Provides detailed reports on experimental procedures Includes sections on background theory and troubleshooting Emphasizes effective state of the art methodology written by recognized experts in the field Includes detailed instructions with annotated advisory comments key references with annotation time considerations and anticipated results      **Biocatalysis in Asymmetric Synthesis** Gonzalo De Gonzalo, Andrés R. Alcántara, 2024-05-04 Biocatalysis in Asymmetric Synthesis a new volume in the Foundations and Frontiers of Enzymology series offers an applied discussion of synthesizing biological catalysts using asymmetric synthesis for applications across research and industry Here global experts in the field analyze a wide variety of biocatalysts and their physical states process conditions for their asymmetric synthesis solvents required during synthesis and even downstream procedures for the recovery of final products The book adopts an interdisciplinary approach merging fundamental biology and its synthetic applications across industries with a wide range of practical examples from directed evolution to biotransformation and production of novel enzymes and non conventional catalysts Throughout the book the impact and application of biocatalysis in sustainable processing is considered in depth This book will also help non experts in biocatalysis to apply this knowledge in their own research providing a thorough overview of the ways asymmetric biocatalytic approaches may be adapted for different disciplines and downstream products Explores biocatalysts as exquisite catalysts for fine chiral compound synthesis in different reaction media Features both foundational overviews and applied practical examples across research and industry Includes chapter contributions from international leaders in the field      Recent Developments in Plant Biotechnology Nihed Ben Halima, 2019-08-13 This volume explores advances in plant biotechnology and focuses on the use of lipids and proteins extracted from different kinds of plants tissues in potential industrial applications In fact lipidomics and proteomics refer to the advancement of technologies such as chromatography and mass spectrometry to study lipids and proteins As such the book discusses an important emerging field of research concerning the use of different plants to produce compounds with high value As such it will appeal to readers with an interest in medical biochemical and biotechnological disciplines

**Confocal Microscopy** Stephen W. Paddock, 2008-02-03



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