



George M. Carman, Ph.D.

Board of Governors Professor &
Distinguished Professor of Food Science
Director, Rutgers Center for Lipid Research,
New Jersey Institute for Food, Nutrition, &
Health

61 Dudley Road
New Brunswick, NJ 08901-8520
Tel: 848-932-0267
Email: gcarman@rutgers.edu
<http://foodsci.rutgers.edu/faculty/carman>

CURRICULUM VITAE

Education

Ph.D., Food Biochemistry, University of Massachusetts, 1977

M.S., Microbiology, Seton Hall University, 1974

B.A., Biology (with honors), William Paterson University, 1972

Appointments

Chief Scientific Officer, New Jersey Institute for Food, Nutrition, & Health, 2014-2017

Director, Rutgers Center for Lipid Research, Rutgers University, 2007-present

Board of Governors Professor, Rutgers University, 2011-present

Distinguished Professor, Department of Food Science, Rutgers University, 1990-present

Visiting Professor, Department of Molecular Biology, Princeton University, 1990-1991

Professor, Department of Food Science, Rutgers University, 1986-1990

Associate Professor, Department of Food Science, Rutgers University, 1982-1986

Assistant Professor, Department of Food Science, Rutgers University, 1978-1982

Postdoctoral Research Fellow, Department of Biochemistry and Molecular Biology,
University of Texas Medical School, Houston, 1977-1978

Research Areas

Biochemistry and molecular biology of phospholipid metabolism and lipid signaling

Professional Affiliations

American Society for *Biochemistry* and Molecular Biology, American Oil Chemists' Society,
American Society for Microbiology, American Chemical Society

Honors

Fellow, American Society for Biochemistry and Molecular Biology (2021)

Federation of European Microbiological Societies (FEMS) Keynote Lectureship, Yeast Lipid
Conference, Ljubljana, Slovenia, 2019

Distinguished Scientist Award, Rutgers University Food Science Alumni Committee, 2016

Chancellor's Award Lectureship in Neuroscience, Louisiana State University School of
Medicine, 2016

Journal of Lipid Research Lectureship Award, 2014

Avanti Award in Lipids, American Society for Biochemistry and Molecular Biology, 2012

MERIT Award, National Institutes of Health, 2010

Research Excellence Award for Sustained Research and Impact, School of Environmental and
Biological Sciences, Rutgers University, 2009

Faculty Mentor of the Year, Compact for Faculty Diversity, 2008

Merck-AAAS Speaker, Hope College, 2006

American Oil Chemists Society-Supelco/Nicholas Pelick Research Award, 2004

Endel Karmas Award for Teaching Excellence, Rutgers University, 2004, 2015, 2021

Board of Trustees Award for Excellence in Research, Rutgers University, 1999

American Academy of Microbiology Fellow, 1998

Foundation for Microbiology Lecturer, 1996-1998

Selman A. Waksman Honorary Lectureship Award, 1996

Research Excellence Award, NJ Agricultural Experiment Station, Rutgers University, 1993

Merit Awards from Rutgers University, 1981, 1983, 1985-1991, 1993, 1994, 1997-2008

Chairman, Gordon Research Conference-Molecular and Cellular Biology of Lipids, 1993
Distinguished Alumni Award from William Paterson University, 1981
Welch Foundation Postdoctoral Fellowship, 1977
Manufacturers Hanover Trust Co. Scholarship, 1968
Memberships in the American Society of Biochemistry and Molecular Biology and the Honorary Societies of Sigma Xi, Phi Tau Sigma
Rutgers Presidential Committee on Academic Planning and Review, 2008-2011
Rutgers Presidential Committee on Standards and Priorities in Academic Development, 1998-2004

Editorships

Journal of Biological Chemistry, Associate Editor, 2006-2019, 2023-present
Journal of Lipid Research, Associate Editor, 2003-2006, 2017-present
Analytical Biochemistry, Executive Editor, 1994-2024
Biochimica et Biophysica Acta Mol. Cell Biol. Lipids, Executive Editor, 2004-2006, Guest Editor, "Regulation of Lipid Metabolism in Yeast" (special issue), 2007

Editorial Boards

Journal of Biological Chemistry, Board Editor, 1998-2003, 1992-1997
Journal of Lipid Research, Board Member, 2006-2016
Journal of Bacteriology, Board Member, 1992-1994
Applied and Environmental Microbiology, Board Member, 1985-1990
Gene Regulation and Systems Biology, Board Member, 2006-2008
Journal of Food Biochemistry, Board Member, 1979-1992
Journal of Food Science, Board Member, 1985-1987
InSight, Board Member, 1998-2002

Grants

National Institutes of Health

Regulation and Role of Phosphatidate Phosphatase in Lipid Metabolism, GM136128, 2020-2025, PI

Phospholipid Metabolism and Membrane Function, GM028140, 1980-2020, PI

Regulation of Phospholipid Synthesis, GM050679, 1994-2021, PI

Regulation of Phosphatidylinositol Metabolism, GM 35655, 1986-1995, PI

Gordon Research Conference on Lipid Metabolism, GM 49037, 1993, PI

Liquid Chromatography Mass Spectrometry System, RR 021120, 2006, Co-PI

National Science Foundation

Regulation of Yeast Phosphatidate Phosphatase, DCB 9204588, 1992-1995, PI

Gordon Research Conference on Lipid Metabolism, IBN 9300895, 1993, PI

American Heart Association

Gordon Research Conference on Lipid Metabolism, 1993, PI

United States Department of the Army

Gordon Research Conference on Lipid Metabolism, 1993, PI

United States Department of Agriculture

Determination of Phosphatidylcholine by Enzymatic Analysis, 1980, PI

Universal Foods Corporation

Biochemistry of Yeast Cell Membranes, 1980-1984, PI

General Foods Fund

Reduction of Linolenic Acid from Soybean Oil, 1979-1981, PI

Mobil Oil Foundation

Enzyme Research Project, 1981-1982, PI

Review Panels

National Institutes of Health

Special Emphasis Panel/Scientific Review Group, NIH Director's Early Independence Award Review, 2023

Biochemistry and Biophysics of Membranes Study Section, Member, 2011-2015; Ad Hoc Member, 2020

Biological Chemistry and Macromolecular Biophysics Study Section, Ad Hoc Member, 2010 (Chair), 2009, 2008 (Chair), 2006

Chemistry and Related Sciences Special Emphasis Panel, 1998, 2004

Membrane Biology and Protein Processing Study Section, 2019

Physiological Chemistry Study Section, Member, 1988-1992, 1998-2002

Physiological Chemistry Study Section, Ad Hoc Member, 1984, 1986, 1987

Reviewers Reserve, 1992-1996

Special Topics in Biological Sciences Study Section, Chair, 2008

Study Section Boundaries Team (for Biological Chemistry and Macromolecular Biophysics Integrated Review Groups), 2003

National Science Foundation: Review Panel for Research Experiences for Undergraduates, 1987

Biotechnology and Biological Sciences Research Council of Scotland, Hannah Research Institute Visiting Group, 1999

Medical University of South Carolina, Department of Biochemistry and Molecular Biology, External Advisory Board, Chair, 2002, 2005

University of Massachusetts, Food Microbiology Review Committee, 1980

Society and Meeting Committees

American Society for Biochemistry and Molecular Biology

Annual Meeting Program Planning Committee, Co-chair, 2006, 2001, Member, 1998, 2002-2004

Awards Committee, 2019-present

Council, 2000-2001, 2002-2006, 2022-present

Lipid Research Division, Director, 2017-2023, Steering Committee, 2010-2017, 2023-present

Meetings Committee, 2001-2004, Chair, 2002-2004

Membership Committee, 2022-present

Satellite Meeting "Membrane Lipids and Cell Function," Co-organizer, 2001

Satellite Meeting "Molecular Characterization of Membrane Lipid Metabolism," Co-organizer, 1998

Search Committee, JBC Editor-in-Chief, Member, 2015-2016

Secretary, 2022-present

Strategic Plan Retreat, 2000

Theme Meeting "Biochemistry and Molecular Biology of Lipids," Co-organizer, 2006

Federation of American Societies for Experimental Biology (FASEB)

Experimental Biology Executive Board, 2005-2008

FASEB Summer Research Conferences Advisory Committee, 2003-2009

FASEB Science Research Conference, "Phospholipid Cell Signaling and Metabolism in Inflammation and Cancer, Co-organizer, 2014

Gordon Research Conference-Molecular and Cellular Biology of Lipids

Chair, 1993, Advisory Committee, 1993-present

International Conference on the Bioscience of Lipids, Steering Committee, 2010-2013, 2018-present

Keystone Symposia, "Cell Activation and Signal Transduction: Lipid Second Messengers IV," Organizer, 2000

Institute of Food Technologists

Annual Meeting Program Committee, 1981-1984

Chairperson to Scientific Sessions of Annual Meetings 1982, 1983

NY Section, Seminar Chair, 1984-1985

Phi Tau Sigma, President of Rutgers University Chapter, 1979-1981

Theobald Smith Society, NJ Branch of the American Society for Microbiology

President, 1997-1998, President Elect and Program Chair, 1996-1997
Local Councilor, 1994-1996
Waksman Award Committee, 1999-2001, Chair 2000
USDA Northeast Regional Project NE-116, Chair, 1982-1984, Secretary, 1980-1982
Yeast Lipid Conference, Steering Committee, 2005-present.

Community Service

Cub Scouts, Troop 66, Den Leader, 1997-1999.
Boy Scouts, Troop 88, Merit badge councilor, 2007-2012, Troop committee, 2007-2013.
West Windsor Township, Basketball Coach, 1998, 1999, 2002, 2003, 2005-2007, 2012; Little League Baseball Coach, 1995, 2001, 2003, 2004, 2007; Girls Softball Coach, 2000; Swimming Official, 2002-2005.
West Windsor-Plainsboro School System, Science Inventors Judge, 1995; Math Partners, development of mathematics curriculum, 1993

Collaborators

Khosrow Adeli, Markus Aebi, Robert M. Bell, Enoch P. Baldwin, Kendall J. Blumer, Dawn L. Brasaemle, David N. Brindley, James R. Broach, Roman Chrast, Mark Christian, Günther Daum, Pascale de Lonlay, Edward A. Dennis, Joseph L. Dixon, William Dowhan, Joseph Eichberg, Scott Emr, Anthony S. Fischl, Thurl E. Harris, Susan A. Henry, Enver Cagri Izgu, Michael Kazmaier, Claudia Kent, Kyung-Sup Kim, Timothy Levine, Christopher R. McMaster, Alfred R. Merrill, Merce Miranda, Thomas J. Montville, Joseph T. Nickels, Jr., Robert A. Niederman, Odile Ozier-Kalogeropoulos, Will Prinz, Christian R.H. Raetz, Symeon Siniosoglou, Myron Solberg, Paul Sternweis, Judith Storch, Stephen L. Sturley, Ming-Daw Tsai, Dennis R. Voelker, Charles J. Waechter, Bruce P. Wasserman, Josef Wissing, Raphael A. Zoeller

Teaching/Mentoring

Courses Taught

Undergraduate: Food Chemistry, Topics in Food Chemistry, Food and Enzymes
Graduate: Food Enzymology, Lipids and Signal Transduction, Food Fundamentals II (participate), Advanced Biochemistry (participate), Biochemistry and Molecular Biology (participate), Yeasts (participate), Microbial Biochemistry (participate),

Current Laboratory Members (6)

Michael Filonovich (undergraduate student), Gil-Soo Han (research associate professor), Kam Shan Hu (undergraduate student), Ruta Jog (postdoctoral associate), Shoily Khondker (postdoctoral associate), Geordan J. Stukey (graduate student).

Former Laboratory Members

Postdoctoral Fellows (29)

Sreenivas Avula (1999-2005), Myonsuk Bae-Lee (1988-1989), Maria Bruno (1993-1995), Taylor Carmon (2022-2023), Hyeon-Son Choi (2008-2011), Prabuddha Dey (2015-2020), Lorena Eguez (2007-2008), Stylianos Fakas (2008-2014), Donna Fugit (1983), Azam Hassaninasab (2016-2019), Kathleen Holland (1986), Michael J. Homann (1988), Lu-Sheng Hsieh (2011-2016), Michael C. Kersting, (2002-2005), Keunsung Kim (1997-1999), Anthony J. Kinney (1988-1989), Joanna Kwiatek (2017-2022), Virginia M. McDonough (1992-1995), Mona Mirheydari (2017-2019), Jeanelle Morgan (2006-2009), Yeonhee Park (2015-2020), Shanthi Rangaswamy (1995-1996), Joseph E. Stukey (1993-1995), Wen-Min Su (2013-2017), David A. Toke (1996-1999), Zhi Xu (2009-2011), Kathleen Welsch (1988), Ying Yu (2000-2002), Geri M. Zeimet (1995-1997)

Ph.D. Recipients (32)

Myongsuk Bae-Lee (1986), Charles J. Belunis (1989), Rosa J. Buxeda (1993), Minjung Chae (2013), Yu-Fang Chang (2007), Mal-Gi Choi (2006), Hyeon-Son Choi (2008), Michael C. Cirigliano (1986), Anthony S. Fischl (1986), Paulette M. Gaynor (1989), Seung-Hee Han (2007), Michael J. Homann (1987), Wendy Iwanyshyn (2005), Michael J. Kelley (1989), Kee-Hong Kim (1999), Yi-Ping Lin (1991), Kelly R. Morlock (1991), He Mu (2000), Joseph T. Nickels Jr. (1993), June Oshiro (2003), Darin B. Ostrander (1998), Apostolos Pappas (1999), Tae-Sik Park (2001), Yeonhee Park (2015), Florencia Pascual (2013), Margaret A. Poole (1986), Yixuan Qiu (2016) Aníbal Soto-Cardalda (2010), Wen-Min Su (2013), Wen-I Wu (1995), Weng-Lang Yang (1996), Ying Yu (2000)

M.S. Recipients (19)

Mal-Gi Choi (2003), Jeffery J. Cousminer (1982), Deirdre A. Dillion (1997), Steven M. Felder (1980), Anthony S. Fischl (1983), Jamie Furneisen (1999), Meagan Hennessy (2018), Michael J. Homann (1984), Joyce M. Hromy (1986), Celeste N. Johnston (2002), Chrysanthos Konstantinou (2011), Maureen McKenzie (1982), Katelyn Meyler (2021), Douglas Minck (1989), Anupama Nadkarni (1994), Daniel J. O'Brien (2001), June Oshiro (1999), Jennifer Quinlan (1991), Michele Robinson (1981), Jeanette E. Quinn (2001)

Undergraduate Students (72)

Refereed Publications (241)

1. Carman, G. M., G. J. Stukey, R. Jog, and G.-S. Han 2025. Insights into phosphatidic acid phosphatase and its potential role as a therapeutic target. *Adv. Biol. Regul.* 87: 101074.
2. Lysyganicz, P. K., A. D. Barbosa, S. Khondker, N. A. Stewart, G. M. Carman, P. J. Stansfeld, M. K. Dymond, and S. Siniosoglou. 2025. Partitioning of fatty acids between membrane and storage lipids controls ER membrane expansion. *EMBO J.* 44: 781-800.
3. Stukey, G. J., M. R. Breuer, N. Burchat, R. Jog, K. Schultz, G.-S. Han, M. S. Sachs, H. Sampath, R. Marmorstein, and G. M. Carman 2025. The antidepressant drug sertraline is a novel inhibitor of yeast Pah1 and human lipin 1 phosphatidic acid phosphatases. *J. Lipid Res.* 66: 100711.
4. Jog, R., G.-S. Han, and G. M. Carman. 2024. The CTR hydrophobic residues of Nem1 catalytic subunit are required to form a protein phosphatase complex with Spo7 to activate yeast Pah1 PA phosphatase. *J. Biol. Chem.* 300: 108003.
5. Stukey, G. J., G.-S. Han, and G. M. Carman. 2024. Architecture and function of yeast phosphatidate phosphatase Pah1 domains/regions. *Biochim. Biophys. Acta Mol. Cell Biol. Lipids* 1869: 159547.
6. Khondker, S., G.-S. Han, and G. M. Carman. 2024. Protein kinase Hsl1 phosphorylates Pah1 to inhibit phosphatidate phosphatase activity and regulate lipid synthesis in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 300: 107572.
7. Jog, R., G.-S. Han, and G. M. Carman. 2024. The *Saccharomyces cerevisiae* Spo7 basic tail is required for Nem1-Spo7/Pah1 phosphatase cascade function in lipid synthesis. *J. Biol. Chem.* 300: 105587
8. Han, G.-S., J. M. Kwiatek, K. S. Hu, and G. M. Carman. 2024. Catalytic core function of yeast Pah1 phosphatidate phosphatase reveals structural insight into its membrane localization and activity control. *J. Biol. Chem.* 300: 105560

9. Stukey, G. J., G.-S. Han, and G. M. Carman 2023. Phosphatidate phosphatase Pah1 contains a novel RP domain that regulates its phosphorylation and function in yeast lipid synthesis. *J. Biol. Chem.* 299: 105025.
10. Dhakephalkar, T., G. J. Stukey, Z. Guan, G. M. Carman, and E. A. Klein. 2023. Characterization of an evolutionarily distinct bacterial ceramide kinase from *Caulobacter crescentus*. *J. Biol. Chem.* 299: 104894.
11. Jog, R., G.-S. Han, and G. M. Carman. 2023. Conserved regions of the regulatory subunit Spo7 are required for Nem1-Spo7/Pah1 phosphatase cascade function in yeast lipid synthesis. *J. Biol. Chem.* 299: 104683.
12. Kwiatek, J. M., B. Gutierrez, E. C. Izgu, G.-S. Han, and G. M. Carman. 2022. Phosphatidic acid mediates the Nem1-Spo7/Pah1 phosphatase cascade in yeast lipid synthesis. *J. Lipid Res.* 63: 100282.
13. Pokharel, M., P. Konarzewska, J. Y. Roberge, G.-S. Han, Y. Wang, G. M. Carman, and C. Xue. 2022. The anticancer drug bleomycin shows potent antifungal activity by altering phospholipid biosynthesis. *Microbiol. Spectr.* 10: e0086222
14. Khondker, S., J. M. Kwiatek, G.-S. Han, and G. M. Carman. 2022. Glycogen synthase kinase homolog Rim11 regulates lipid synthesis through the phosphorylation of Pah1 phosphatidate phosphatase in yeast. *J. Biol. Chem.* 298: 102221.
15. Khondker, S., G.-S. Han, and G. M. Carman. 2022. Phosphorylation-mediated regulation of the Nem1-Spo7/Pah1 phosphatase cascade in yeast lipid synthesis. *Adv. Biol. Regul.* 84: 100889.
16. Park, Y., G. J. Stukey, R. Jog, J. M. Kwiatek, G.-S. Han, and G. M. Carman 2022. Mutant phosphatidate phosphatase Pah1-W637A exhibits altered phosphorylation, membrane association, and enzyme function in yeast. *J. Biol. Chem.* 298: 101578.
17. Carman, G. M. 2021. Lipid metabolism has been good to me. *J. Biol. Chem.* 297: 100786.
18. Dey, P., G.-S. Han, and G. M. Carman. 2020. A review of phosphatidate phosphatase assays. *J. Lipid Res.* 61: 1556-1564.
19. Mirheydari, M., P. Dey, G. J. Stukey, Y. Park, G.-S. Han, G. M. Carman. 2020. The Spo7 sequence LLI is required for Nem1-Spo7/Pah1 phosphatase cascade function in yeast lipid metabolism. *J. Biol. Chem.* 295: 11473-11485.
20. Kwiatek, J. M., G. M. Carman. 2020. Yeast phosphatidic acid phosphatase Pah1 hops and scoots along the membrane phospholipid bilayer. *J. Lipid Res.* 61: 1232-1243.
21. Kwiatek, J. M., G.-S. Han, and G. M. Carman 2020. Phosphatidate-mediated regulation of lipid synthesis at the nuclear/endoplasmic reticulum membrane. *Biochim. Biophys. Acta Mol. Cell Biol. Lipids* 1865: 158434.
22. Hassaninasab, A., L. S. Hsieh, W. M. Su, G.-S. Han, and G. M. Carman 2019. Yck1 casein kinase I regulates the activity and phosphorylation of Pah1 phosphatidate phosphatase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 294: 18256-18268.
23. Dey, P., W. M. Su, M. Mirheydari, G.-S. Han, and G. M. Carman 2019. Protein kinase C mediates the phosphorylation of the Nem1-Spo7 protein phosphatase complex in yeast. *J. Biol. Chem.* 294: 15997-16009.

24. Hennessy, M., M. E. Granade, A. Hassaninasab, D. Wang, J. M. Kwiatek, G.-S. Han, T. E. Harris, and G. M. Carman. 2019. Casein kinase II-mediated phosphorylation of lipin 1 β phosphatidate phosphatase at Ser-285 and Ser-287 regulates its interaction with 14-3-3 β protein. *J. Biol. Chem.* 294: 2365-2374.
25. Konarzewska, P., Y. Wang, G.-S. Han, K. J. Goh, Y. G. Gao, G. M. Carman, and C. Xue. 2019. Phosphatidylserine synthesis is essential for viability in the human fungal pathogen *Cryptococcus neoformans*. *J. Biol. Chem.* 294: 2329-2339.
26. Carman, G. M. 2019. Discoveries of the phosphatidate phosphatase genes in yeast published in the *Journal of Biological Chemistry*. *J. Biol. Chem.* 294: 1681-1689.
27. Carman, G. M. and G.-S. Han. 2019. Fat-regulating phosphatidic acid phosphatase: a review of its roles and regulation in lipid homeostasis. *J. Lipid Res.* 60: 2-6.
28. Su, W.-M., G.-S. Han, P. Dey, and G. M. Carman. 2018. Protein kinase A phosphorylates the Nem1-Spo7 protein phosphatase complex that regulates the phosphorylation state of the phosphatidate phosphatase Pah1 in yeast. *J. Biol. Chem.* 293: 15801-15814.
29. Carman, G. M. and G.-S. Han 2018. Phosphatidate phosphatase regulates membrane phospholipid synthesis via phosphatidylserine synthase. *Adv. Biol. Regul.* 67: 49-58.
30. Zhang, Z., G. He, G.-S. Han, J. Zhang, N. Catanzaro, A. Diaz, Z. Wu, G. M. Carman, L. Xie, and X. Wang. 2018. Host Pah1p phosphatidate phosphatase limits viral replication by regulating phospholipid synthesis. *PLoS. Pathog.* 14: e1006988
31. Hayes, M., V. Choudhary, N. Ojha, J. J. Shin, G.-S. Han, G. M. Carman, C. J. Loewen, W. A. Prinz, and T. Levine. 2017. Fat storage-inducing transmembrane (FIT or FITM) proteins are related to lipid phosphatase/phosphotransferase enzymes. *Microb. Cell* 5: 88-103.
32. Park, Y., G.-S. Han, and G. M. Carman. 2017. A conserved tryptophan within the WRDPLVDID domain of yeast Pah1 phosphatidate phosphatase is required for its *in vivo* function in lipid metabolism. *J. Biol. Chem.* 292: 19580-19589.
33. Han, G.-S., and G. M. Carman. 2017. Yeast *PAH1*-encoded phosphatidate phosphatase controls the expression of *CHO1*-encoded phosphatidylserine synthase for membrane phospholipid synthesis. *J. Biol. Chem.* 292: 13230-13242.
34. Hassaninasab, A., G.-S. Han, and G. M. Carman. 2017. Tips on the analysis of phosphatidic acid by the fluorometric coupled enzyme assay. *Anal. Biochem.* 526: 69-70.
35. Dey, P., W.-M. Su, G.-S. Han, and G. M. Carman. 2017. Phosphorylation of lipid metabolic enzymes by protein kinase C requires phosphatidylserine and diacylglycerol. *J. Lipid Res.* 58: 742-751.
36. Qiu, Y., A. Hassaninasab, G.-S. Han, and G. M. Carman. 2016. Phosphorylation of Dgk1 diacylglycerol kinase by casein kinase II regulates phosphatidic acid production in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 291: 26455-26467.
37. Temprano, A., H. Sembongi, G. S. Han, D. Sebastian, J. Capellades, C. Moreno, J. Guardiola, M. Wabitsch, C. Richart, O. Yanes, A. Zorzano, G. M. Carman, S. Siniosoglou, and M. Miranda. 2016. Redundant roles of the phosphatidate phosphatase family in triacylglycerol synthesis in human adipocytes. *Diabetologia* 59: 1985-1994.

38. Hsieh, L.-S., W.-M. Su, G.-S. Han, and G.M. Carman. 2016. Phosphorylation of yeast Pah1 phosphatidate phosphatase by casein kinase II regulates its function in lipid metabolism. *J. Biol. Chem.* 291: 9974-9990.
39. Barneda D., J. Planas-Iglesias, M. L. Gaspar, D. Mohammadyani, S. Prasannan, D. Dormann, G. S. Han, S. A. Jesch, G. M. Carman, V. Kagan, M. G. Parker, N. T. Ktistakis, J. Klein-Seetharaman, A. M. Dixon, S. A. Henry, and M. Christian. 2015. The brown adipocyte protein CIDEA promotes lipid droplet fusion via a phosphatidic acid-binding amphipathic helix. *Elife*. DOI: 10.7554/eLife.07485
40. Park Y., G.-S. Han, E. Mileykovskaya, T. A. Garrett, and G. M. Carman. 2015. Altered lipid synthesis by lack of yeast Pah1 phosphatidate phosphatase reduces chronological life span. *J. Biol. Chem.* 290: 25382-25394.
41. Barbosa A. D., H. Sembongi, W. M. Su, S. Abreu, F. Reggiori, G. M. Carman, and S. Siniossoglou. 2015. Lipid partitioning at the nuclear envelope controls membrane biogenesis. *Mol. Biol. Cell* 26: 3641-3657.
42. Merrill, A.H., Jr., and G. M. Carman. 2015. Introduction to thematic minireview series: novel bioactive sphingolipids. *J. Biol. Chem.* 290: 15362-15364.
43. Hsieh L.-S., W.-M. Su, G.-S. Han, and G. M. Carman. 2015. Phosphorylation regulates the ubiquitin-independent degradation of yeast Pah1 phosphatidate phosphatase by the 20S proteasome. *J. Biol. Chem.* 290: 11467-78.
44. Sahu-Osen, A., G. Montero-Moran, M. Schittmayer, K. Fritz, A. Dinh, Y.-F. Chang, D. McMahon, A. Boeszoermyeni, I. Cornaciu, D. Russell, M. Oberer, G. M. Carman, R. Birner-Gruenberger, and D. L. Brasaemle. 2015. CGI-58/ABHD5 is phosphorylated on Ser-239 by protein kinase A: Control of subcellular localization. *J. Lipid Res.* 56: 109-121.
45. Su, W.-M., G.-S. Han, and G. M. Carman. 2014. Yeast Nem1-Spo7 protein phosphatase activity on Pah1 phosphatidate phosphatase is specific for the Pho85-Pho80 protein kinase phosphorylation sites. *J. Biol. Chem.* 289: 34699-34708.
46. Gomez-Cambronero, J. and G. M. Carman 2014. Thematic minireview series on phospholipase D and cancer. *J. Biol. Chem.* 289: 22554-22556.
47. McMahon, D., A. Dinh, D. Kurz, D. Shah, G.-S. Han, G. M. Carman, and D. L. Brasaemle 2014. Comparative gene identification 58/alpha/beta hydrolase domain 5 lacks lysophosphatidic acid acyltransferase activity. *J. Lipid Res.* 55: 1750-1761.
48. Su, W.-M., Han, G.-S., and Carman, G. M. 2014. Cross-talk phosphorylations by protein kinase C and Pho85p-Pho80p protein kinase regulate Pah1p phosphatidate phosphatase abundance in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 289: 18818-18830.
49. Pascual, F., L.-S. Hsieh, A. Soto-Cardalda, and G. M. Carman 2014. Yeast Pah1p phosphatidate phosphatase is regulated by proteasome-mediated degradation. *J. Biol. Chem.* 289: 9811-9822.
50. Pascual F., A. Soto-Cardalda, G. M. Carman. 2013. PAH1-encoded phosphatidate phosphatase plays a role in the growth phase- and inositol-mediated regulation of lipid synthesis in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 288: 35781-35792.

51. Gallo-Ebert, C., M. Donigan, H. Y. Liu, F. Pascual, M. Manners, D. Pandya, R. Swanson, D. Gallagher, W. Chen, G. M. Carman, and J. T. Nickels, Jr. 2013. The yeast anaerobic response element AR1b regulates aerobic antifungal drug-dependent sterol gene expression. *J. Biol. Chem.* 288: 35466-35477.
52. Sembongi, H., M. Miranda, G.-S. Han, S. Fakas, N. Grimsey, J. Vendrell, G. M. Carman, and S. Siniossoglou 2013. Distinct roles of the phosphatidate phosphatases lipin 1 and 2 during adipogenesis and lipid droplet biogenesis in 3T3-L1 cells. *J. Biol. Chem.* 288: 34502-34513.
53. Michot, C., A. Mamoune, J. Vamecq, M. T. Viou, L.-S. Hsieh, E. Testet, J. Laine, L. Hubert, A. F. Dessein, M. Fontaine, C. Ottolenghi, L. Fouillen, K. Nadra, E. Blanc, J. Bastin, S. Candon, M. Pende, A. Munnich, A. Smahi, F. Djouadi, G. M. Carman, N. Romero, Y. de Keyzer, and P. de Lonlay 2013. Combination of lipid metabolism alterations and their sensitivity to inflammatory cytokines in human lipin-1-deficient myoblasts. *Biochim. Biophys. Acta* 1832: 2103-2114.
54. Qiu, Y., S. Fakas, G.-S. Han, A.D. Barbosa, S. Siniossoglou, and G. M. Carman. 2013. Transcription factor Reb1p regulates *DGK1*-encoded diacylglycerol kinase and lipid metabolism in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 288: 29124-29133.
55. Kim, H. E., E. Bae, D.-Y. Jeong, M.-J. Kim, W.-J. Jin, S. W. Park, G.-S. Han, G. M. Carman, E. Koh, and K.-S. Kim. 2013. Lipin1 regulates PPAR γ transcriptional activity. *Biochem.J.* 453: 49-60.
56. Karanasios, E., A. D. Barbosa, H. Sembongi, M. Mari, G.-S. Han, F. Reggiori, G. M. Carman, and S. Siniossoglou. 2013. Regulation of lipid droplet and membrane biogenesis by the acidic tail of the phosphatidate phosphatase Pah1p. *Mol.Biol.Cell* 24: 2124-2133.
57. Chae, M. and G.M. Carman. 2013. Characterization of the yeast actin patch protein App1p phosphatidate phosphatase. *J. Biol. Chem.* 288: 6427-6437.
58. Pascual, F. and G. M. Carman. 2013. Phosphatidate phosphatase, a key regulator of lipid homeostasis. *Biochim. Biophys. Acta.* 1831: 514-522.
59. Chae, M., G.-S. Han, and G. M. Carman. 2012. The *Saccharomyces cerevisiae* actin patch protein App1p is a phosphatidate phosphatase enzyme. *J. Biol. Chem.* 287: 40186-40196.
60. Nadra, K., J. J. Medard, J. D. Mul, G.-S. Han, S. Gres, M. Pende, D. Metzger, P. Chambon, E. Cuppen, J. S. Saulnier-Blache, G. M. Carman, B. Desvergne, and R. Chrast. 2012. Cell autonomous lipin 1 function is essential for development and maintenance of white and brown adipose tissue. *Mol. Cell Biol.* 32: 4794-4810.
61. Carman, G. M. 2012. An unusual phosphatidylethanolamine-utilizing cardiolipin synthase is discovered in bacteria. *Proc. Natl. Acad. Sci. U. S. A* 109:16402-16403.
62. Su, W.-M., G.-S. Han, J. Casciano, and G. M. Carman. 2012. Protein kinase A-mediated phosphorylation of Pah1p phosphatidate phosphatase functions in conjunction with the Pho85p-Pho80p and Cdc28p-cyclin B kinases to regulate lipid synthesis in yeast. *J. Biol. Chem.* 287:33364-33376.
63. Choi, H. S., W. M. Su, G. S. Han, D. Plote, Z. Xu, and G. M. Carman. 2012. Pho85p-Pho80p phosphorylation of yeast Pah1p phosphatidate phosphatase regulates its activity, location, abundance, and function in lipid metabolism. *J. Biol. Chem.* 287: 11290-11301.

64. Henry, S.A., S.D. Kohlwein, and G.M. Carman. 2012. Metabolism and regulation of glycerolipids in the yeast *Saccharomyces cerevisiae*. *Genetics* 190: 317-349.
65. Carman, G. M. 2012. Thematic minireview series on the lipid droplet, a dynamic organelle of biomedical and commercial importance. *J. Biol. Chem.* 287: 2272.
66. Xu Z., W. M. Su, G. M. Carman. 2012. Fluorescence spectroscopy measures yeast *PAH1*-encoded phosphatidate phosphatase interaction with liposome membranes. *J. Lipid Res.* 53: 522-528.
67. Soto-Cardalda A., S. Fakas, F. Pascual, H. S. Choi, G. M. Carman. 2011. Phosphatidate phosphatase plays role in zinc-mediated regulation of phospholipid synthesis in yeast. *J. Biol. Chem.* 287: 968-977.
68. Fakas, S., Y. Qiu, J. L. Dixon, G.-S. Han, K. V. Ruggles, J. Garbarino, S. L. Sturley, and G. M. Carman. 2011. Phosphatidate phosphatase activity plays a key role in protection against fatty acid-induced toxicity in yeast. *J. Biol. Chem.* 286:29074-29085.
69. Wang, H., J. Zhang, W. Qiu, G.-S. Han, G. M. Carman, and K. Adeli. 2011. Lipin-1 γ isoform is a novel lipid droplet-associated protein highly expressed in the brain. *FEBS Lett.* 585, 1279-1284.
70. Mul, J. D., K. Nadra, N. B. Jagalur, I. J. Nijman, P. W. Toonen, J. J. Medard, S. Gres, B. A. de, G.-S. Han, J. F. Brouwers, G.M. Carman, J. S. Saulnier-Blache, D. Meijer, R. Chrast, and E. Cuppen 2011. A hypomorphic mutation in *Lpin1* induces progressively improving neuropathy and lipodystrophy in the rat. *J.Biol.Chem.* 286: 26781-26793.
71. Choi, H.-S., W.-M. Su, J. M. Morgan, G.-S. Han, Z. Xu, E. Karanasios, S. Siniossoglou, and G. M. Carman. 2011. Phosphorylation of phosphatidate phosphatase regulates its membrane association and physiological functions in *Saccharomyces cerevisiae*. Identification of Ser⁶⁰², Thr⁷²³, and Ser⁷⁴⁴ as the sites phosphorylated by *CDC28* (*CDK1*)-encoded cyclin-dependent kinase. *J. Biol. Chem.* 286:1486-1498.
72. Fakas, S., C. Konstantinou, and G. M. Carman. 2011. *DGK1*-encoded diacylglycerol kinase activity is required for phospholipid synthesis during growth resumption from stationary phase in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 286:1464-1474.
73. Carman, G.M., and G.-S. Han. 2011. Regulation of phospholipid synthesis in the yeast *Saccharomyces cerevisiae*. *Ann. Rev. Biochem.* 80: 859-883.
74. Carman, G.M. 2011. The discovery of the fat-regulating phosphatidic acid phosphatase gene. *Front. Biol.* 6: 172-176.
75. Karanasios, E., G.-S. Han, Z. Xu, G. M. Carman, and S. Siniossoglou. 2010. A phosphorylation-regulated amphipathic helix controls the membrane translocation and function of the yeast phosphatidate phosphatase. *Proc. Natl. Acad. Sci. U. S. A.* 107:17539-17544.
76. Han, G.-S. and G. M. Carman. 2010. Characterization of the human *LPIN1*-encoded phosphatidate phosphatase isoforms. *J. Biol. Chem.* 285: 14628-14638.
77. Choi, H.-S., G.-S. Han, and G. M. Carman. 2010. Phosphorylation of yeast phosphatidylserine synthase by protein kinase A. Identification of Ser⁴⁶ and Ser⁴⁷ as major sites of phosphorylation. *J. Biol. Chem.* 285: 11526-11536.

78. Montero-Moran, G., J. M. Caviglia, D. McMahon, A. Rothenberg, V. Subramanian, Z. Xu, S. Lara-Gonzalez, J. Storch, G.M. Carman, and D.L. Brasaemle. 2010. CGI-58/ABHD5 is a coenzyme A-dependent lysophosphatidic acid acyltransferase. *J. Lipid Res.* 51: 709-719.
79. Haller, J. F., C. Smith, D. Liu, H. Zheng, K. Tornheim, G.-S. Han, G. M. Carman, and R. A. Zoeller. 2010. Isolation of novel animal cell lines defective in glycerolipid biosynthesis reveals mutations in glucose-6-phosphate isomerase. *J. Biol. Chem.* 285: 866-877.
80. Elswaifi, S. F., F. St. Michael, A. Sreenivas, A. Cox, G.M. Carman, and T.J. Inzana. 2009. Molecular characterization of phosphorylcholine expression on the lipooligosaccharide of *Histophilus somni*. *Microb.Pathog.* 47: 223-230.
81. Carman, G.M., and G.-S. Han. 2009. Regulation of phospholipid synthesis in yeast. *J. Lipid Res.* 50: S69-S73.
82. Carman, G.M., and G.-S. Han. 2009. Phosphatidic acid phosphatase, a key enzyme in the regulation of lipid synthesis. *J. Biol. Chem.* 284: 2593-2597.
83. Grimsey, N., G. S. Han, L. O' Hara, J. J. Rochford, G. M. Carman, and S. Siniosoglou. 2008. Temporal and spatial regulation of the phosphatidate phosphatases lipin 1 and 2. *J. Biol. Chem.* 283: 29166-29174.
84. Han, G.-S., L. O' Hara, G.M. Carman, and S. Siniosoglou. 2008. An unconventional diacylglycerol kinase that regulates phospholipid synthesis and nuclear membrane growth. *J. Biol. Chem.* 283: 20433-20442.
85. Han, G.-S., L. O' Hara, S. Siniosoglou, and G.M. Carman. 2008. Characterization of the yeast *DGK1*-encoded CTP-dependent diacylglycerol kinase. *J. Biol. Chem.* 283: 20443-20453.
86. Chang, Y.-F., and G.M. Carman. 2008. CTP synthetase and its role in phospholipid synthesis in the yeast *Saccharomyces cerevisiae*. *Prog. Lipid Res.* 47: 333-339.
87. Nadra, K., A.-S. de Preux Charles, J.-J. Médard, W.T. Hendriks, G.-S. Han, S. Grès, G.M. Carman, J.-S. Saulnier-Blache, M.H.G. Verheijen, and R. Chrast. 2008. Phosphatidic acid mediates demyelination in *Lpin1* mutant mice. *Genes Dev.* 22, 1647-1661.
88. Soto, A., and G.M. Carman. 2008. Regulation of the *Saccharomyces cerevisiae* *CK11*-encoded choline kinase by zinc depletion. *J. Biol. Chem.* 283: 10079-10088.
89. Havriluk, T., F. Lozy, S. Siniosoglou, and G.M. Carman. 2008. Colorimetric determination of pure Mg^{2+} -dependent phosphatidate phosphatase activity. *Anal. Biochem.* 373: 392-394.
90. Carman, G.M., and S.A. Henry. 2007. Phosphatidic acid plays a central role in the transcriptional regulation of glycerophospholipid synthesis in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 282: 37293-37297.
91. Han, G.-S., S. Siniosoglou, and G.M. Carman. 2007. The cellular functions of the yeast lipin homolog Pah1p are dependent on its phosphatidate phosphatase activity. *J. Biol. Chem.* 282: 37026-37035.
92. Carman, G.M., and W.-I. Wu. 2007. Lipid phosphate phosphatases from *Saccharomyces cerevisiae*. *Methods. Enzymol.* 434: 305-315.

93. Choi, H.-S., and G.M. Carman. 2007. Respiratory deficiency mediates the regulation of *CHO1*-encoded phosphatidylserine synthase by mRNA stability in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 282: 31217-31227.
94. Chang, Y.-F., S.S. Martin, E.P. Baldwin, and G.M. Carman. 2007. Phosphorylation of human CTP synthetase 1 by protein kinase C. Identification of Ser⁴⁶² and Thr⁴⁵⁵ as major sites of phosphorylation. *J. Biol. Chem.* 282: 17613-17622.
95. Choi, M.-G., and G.M. Carman. 2007. Phosphorylation of human CTP synthetase 1 by protein kinase A. Identification of Thr⁴⁵⁵ as a major site of phosphorylation. *J. Biol. Chem.* 282: 5367-5377.
96. Carman, G.M., and G.-S. Han. 2007. Regulation of phospholipid synthesis in *Saccharomyces cerevisiae* by zinc depletion. *Biochim. Biophys. Acta.* 1771: 322-330.
97. Carman, G.M., and S.A. Henry. 2007. Special issue: Regulation of lipid metabolism in yeast. *Biochim. Biophys. Acta.* 1771: 239-240.
98. Carman, G.M., and G.-S. Han. 2006. Roles of phosphatidate phosphatase enzymes in lipid metabolism. *Trends Biochem. Sci.* 31: 694-699.
99. O'Hara, L., G.-S. Han, S. Peak-Chew, N. Grimsey, G.M. Carman, and S. Siniossoglou. 2006. Control of phospholipid synthesis by phosphorylation of the yeast lipin Pah1p/Smp2p Mg²⁺-dependent phosphatidate phosphatase. *J. Biol. Chem.* 281: 34537-34548.
100. Kersting, M.C., and G.M. Carman. 2006. Regulation of the *Saccharomyces cerevisiae* *EK11*-encoded ethanolamine kinase by zinc depletion. *J. Biol. Chem.* 281: 13110-13116.
101. Han, G.-S., W.-I. Wu, and G.M. Carman. 2006. The *Saccharomyces cerevisiae* lipin homolog is a Mg²⁺-dependent phosphatidate phosphatase enzyme. *J. Biol. Chem.* 281: 9210-9218.
102. Chang, Y.-F., and G.M. Carman. 2006. Casein kinase II phosphorylation of the yeast phospholipid synthesis transcription factor Opi1p. *J. Biol. Chem.* 281: 4754-4761.
103. Han, G.-S., A. Sreenivas, M.-G. Choi, Y.-F. Chang, S.S. Martin, E.P. Baldwin, and G.M. Carman. 2005. Expression of human CTP synthetase in *Saccharomyces cerevisiae* reveals phosphorylation by protein kinase A. *J. Biol. Chem.* 280: 38328-38336.
104. Carman, G. M. 2005. Regulation of phospholipid synthesis in yeast by zinc. *Biochem. Soc. Trans.* 33: 1150-1153.
105. Han, S.-H., G.-S. Han, W.M. Iwanyshyn, and G.M. Carman. 2005. Regulation of the *PIS1*-encoded phosphatidylinositol synthase in *Saccharomyces cerevisiae* by zinc. *J. Biol. Chem.* 280: 29017-29024.
106. Chang, F.S., G.-S. Han, G.M. Carman, and K.J. Blumer. 2005. A WASp-binding type II phosphatidylinositol 4-kinase is required for actin polymerization-dependent endosome motility. *J. Cell Biol.* 171: 133-142.
107. Choi, M.-G., V. Kurnov, M.C. Kersting, A. Sreenivas, and G.M. Carman. 2005. Phosphorylation of the yeast choline kinase by protein kinase C. Identification of Ser²⁵ and Ser³⁰ as major sites of phosphorylation. *J. Biol. Chem.* 280: 26105-26112.

108. Kersting, M.C., H.-S. Choi, and G.M. Carman. 2004. Regulation of the yeast *EKI1*-encoded ethanolamine kinase by inositol and choline. *J. Biol. Chem.* 279: 35353-35359.
109. Iwanyshyn, W.M., G.-S. Han, and G.M. Carman. 2004. Regulation of phospholipid synthesis in *Saccharomyces cerevisiae* by zinc. *J. Biol. Chem.* 279: 21976-21983.
110. Choi, H.-S., A. Sreenivas, G.-S. Han, and G.M. Carman. 2004. Regulation of phospholipid synthesis in the yeast *cki1Δ eki1Δ* mutant defective in the Kennedy pathway. The *CHO1*-encoded phosphatidylserine synthase is regulated by mRNA stability. *J. Biol. Chem.* 279: 12081-12087.
111. Han, G.-S., C.N. Johnston, and G.M. Carman. 2004. Vacuole membrane topography of the *DPP1*-encoded diacylglycerol pyrophosphate phosphatase catalytic site from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 279: 5338-5345.
112. Carman, G.M., and M.C. Kersting. 2004. Phospholipid synthesis in yeast: regulation by phosphorylation. *Biochem. Cell Biol.* 82: 62-70.
113. Han, G.-S., and G.M. Carman. 2004. Assaying lipid phosphate phosphatase activities. *Methods Mol. Biol.* 284: 209-216.
114. Han, G.-S., and G.M. Carman. 2004. Phospholipid synthesis in yeast, in *Encyclopedia of Biological Chemistry* (W.J. Lennarz and M.D. Lane, eds), Elsevier, Oxford. 3: 321-325.
115. McEntire, J.C., G.M. Carman, and T.J. Montville. 2004. Increased ATPase activity is responsible for acid sensitivity of nisin-resistant *Listeria monocytogenes* ATCC 700302. *Appl. Environ. Microbiol.* 70: 2717-21.
116. Oshiro, J., G.-S. Han, and G.M. Carman. 2003. Diacylglycerol pyrophosphate phosphatase in *Saccharomyces cerevisiae*. *Biochim. Biophys. Acta* 1635: 1-9.
117. Oshiro, J., G.-S. Han, W.M. Iwanyshyn, K. Conover, and G.M. Carman. 2003. Regulation of the yeast *DPP1*-encoded diacylglycerol pyrophosphate phosphatase by transcription factor Gis1p. *J. Biol. Chem.* 278: 31495-31503.
118. Choi, M.-G., T.-S. Park, and G.M. Carman. 2003. Phosphorylation of *Saccharomyces cerevisiae* CTP synthetase at Ser⁴²⁴ by protein kinases A and C regulates phosphatidylcholine synthesis by the CDP-choline pathway. *J. Biol. Chem.* 278: 23610-23616.
119. Sreenivas, A., and G.M. Carman. 2003. Phosphorylation of the yeast phospholipid synthesis regulatory protein Opi1p by protein kinase A. *J. Biol. Chem.* 278: 20673-20680.
120. Park, T.-S., D.J. O'Brien, and G.M. Carman. 2003. Phosphorylation of CTP synthetase on Ser³⁶, Ser³³⁰, Ser³⁵⁴, and Ser⁴⁵⁴ regulates the levels of CTP and phosphatidylcholine synthesis in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 278: 20785-20794.
121. Han, G.-S., A. Audhya, D.J. Markley, S.D. Emr, and G.M. Carman. 2002. The *Saccharomyces cerevisiae* *LSB6* gene encodes phosphatidylinositol 4-kinase activity. *J. Biol. Chem.* 277: 47709-47718.
122. Yu, Y., A. Sreenivas, D.B. Ostrander, and G.M. Carman. 2002. Phosphorylation of *Saccharomyces cerevisiae* choline kinase on Ser³⁰ and Ser⁸⁵ by protein kinase A regulates phosphatidylcholine synthesis by the CDP-choline pathway. *J. Biol. Chem.* 277: 34978-34986.

123. Sreenivas, A., M.J. Villa-Garcia, S.A. Henry, and G.M. Carman. 2001. Phosphorylation of the yeast phospholipid synthesis regulatory protein Opi1p by protein kinase C. *J. Biol. Chem.* 276: 29915-29923.
124. Fernandez, F., J.S. Rush, D.A. Toke, G.-S. Han, J.E. Quinn, G.M. Carman, J.-Y. Choi, D.R. Voelker, M. Aebi, and C.J. Waechter. 2001. The *CWH8* gene encodes a dolichyl pyrophosphate phosphatase with a lumenally oriented active site in the endoplasmic reticulum of *Saccharomyces cerevisiae*. *J. Biol. Chem.* 2001 276: 41455-41464.
125. Han, G.-S., C.N. Johnston, X. Chen, K. Athenstaedt, G. Daum, and G.M. Carman. 2001. Regulation of the *Saccharomyces cerevisiae* *DPP1*-encoded diacylglycerol pyrophosphate phosphatase by zinc. *J. Biol. Chem.* 276: 10126-10133.
126. Pierrugues, O., C. Brutesco, J. Oshiro, M. Gouy, Y. Deveaux, G.M. Carman, P. Thuriaux, and M. Kazmaier. 2001. Lipid phosphate phosphatases in *Arabidopsis*. Regulation of *AtLPP1* in response to stress. *J. Biol. Chem.* 276: 20300-20308.
127. Yu, Y., H.H. Mu, B.P. Wasserman, and G.M. Carman. 2001. Identification of the maize amyloplast stromal 112-kD protein as a plastidic starch phosphorylase. *Plant Physiol.* 125: 351-359.
128. Mu, H.H., Y. Yu, B.P. Wasserman, and G.M. Carman. 2001. Purification and characterization of the maize amyloplast stromal 112-kD starch phosphorylase. *Arch. Biochem. Biophys.* 388: 155-164.
129. Furneisen, J.M., and G.M. Carman. 2000. Enzymological properties of the *LPP1*-encoded lipid phosphatase from *Saccharomyces cerevisiae*. *Biochim. Biophys. Acta* 1484: 71-82.
130. Shih, C., G.M. Carman, and B.P. Wasserman. 2000. Ripening-associated proteolysis of a 27-kDa major intrinsic protein (MIP27) in tomato fruit. *J. Food Biochem.* 24: 213-224.
131. Wu, W.-I., and G.M. Carman. 2000. Kinetic analysis of sphingoid base inhibition of yeast phosphatidate phosphatase. *Methods Enzymol.* 312: 373-380.
132. Oshiro, J., S. Rangaswamy, X. Chen, G.-S. Han, J.E. Quinn, and G.M. Carman. 2000. Regulation of the *DPP1*-encoded diacylglycerol pyrophosphate (DGPP) phosphatase by inositol and growth phase. Inhibition of DGPP phosphatase activity by CDP-diacylglycerol and activation of phosphatidylserine synthase activity by DGPP. *J. Biol. Chem.* 275: 40887-40896.
133. Balboa, M.A., J. Balsinde, D.A. Dillon, G.M. Carman, and E.A. Dennis. 1999. Proinflammatory macrophage-activating properties of the novel phospholipid diacylglycerol pyrophosphate. *J. Biol. Chem.* 274: 522-526.
134. Kim, K.-H., and G.M. Carman. 1999. Phosphorylation and regulation of choline kinase from *Saccharomyces cerevisiae* by protein kinase A. *J. Biol. Chem.* 274: 9531-9538.
135. Kent, C., and G.M. Carman. 1999. Interactions among pathways for phosphatidylcholine metabolism, CTP synthesis and secretion through the Golgi apparatus. *Trends Biochem. Sci.* 24: 146-150.
136. Faulkner, A., X. Chen, J. Rush, B. Horazdovsky, C.J. Waechter, G.M. Carman, and P.C. Sternweis. 1999. The *LPP1* and *DPP1* gene products account for most of the isoprenoid phosphate phosphatase activities in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 274: 14831-14837.

137. Kim, K., K.-H. Kim, M.K. Storey, D.R. Voelker, and G.M. Carman. 1999. Isolation and characterization of the *Saccharomyces cerevisiae* *EK11* gene encoding ethanolamine kinase. *J. Biol. Chem.* 274: 14857-14866.
138. Jasinska, R., Q.-X. Zhang, C. Pilquill, I. Singh, J. Xu, J. Dewald, D.A. Dillon, L.G. Berthiaume, G.M. Carman, D.W. Waggoner, and D.N. Brindley. 1999. Lipid phosphate phosphohydrolase-1 degrades exogenous glycerolipid and sphingolipid phosphate esters. *Biochem. J.* 340: 677-686.
139. Park, T.-S., D.B. Ostrander, A. Pappas, and G.M. Carman. 1999. Identification of Ser⁴²⁴ as the protein kinase A phosphorylation site in CTP synthetase from *Saccharomyces cerevisiae*. *Biochemistry* 38: 8839-8848.
140. Toke, D.A., M.L. McClintick, and G. M. Carman. 1999. Mutagenesis of the phosphatase sequence motif in diacylglycerol pyrophosphate phosphatase from *Saccharomyces cerevisiae*. *Biochemistry* 38: 14606-14613.
141. Carman, G.M. and S.A. Henry. 1999. Phospholipid biosynthesis in the yeast *Saccharomyces cerevisiae* and interrelationship with other metabolic processes. *Prog. Lipid Res.* 38: 361-399.
142. Pappas, A., T.-S. Park, and G.M. Carman. 1999. Characterization of a novel dUTP-dependent activity of CTP synthetase from *Saccharomyces cerevisiae*. *Biochemistry* 38: 16671-16677.
143. Toke, D.A., W. L. Bennett, D. A. Dillon, W.-I. Wu, X. Chen, D.B. Ostrander, J. Oshiro, A. Cremesti, D.R. Voelker, A.S. Fischl, and G.M. Carman. 1998. Isolation and characterization of the *Saccharomyces cerevisiae* *DPP1* gene encoding diacylglycerol pyrophosphate phosphatase. *J. Biol. Chem.* 273: 3278-3284.
144. Kim, K.-H., D.R. Voelker, M.T. Flocco, and G.M. Carman. 1998. Expression, purification, and characterization of choline kinase, product of the *CKI* gene from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 273: 6844-6852.
145. Toke, D.A., W.L. Bennett, J. Oshiro, W.-I. Wu, D.R. Voelker, and G.M. Carman. 1998. Isolation and characterization of the *Saccharomyces cerevisiae* *LPP1* gene encoding a Mg²⁺-independent phosphatidate phosphatase. *J. Biol. Chem.* 273: 14331-14338.
146. Pappas, A., W.-L. Yang, T.-S. Park, and G.M. Carman. 1998. Nucleotide-dependent tetramerization of CTP synthetase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 273: 15954-15960.
147. Ostrander, D.B., D.J. O'Brien, J.A. Gorman, and G.M. Carman. 1998. Effect of CTP synthetase regulation by CTP on phospholipid synthesis in *Saccharomyces cerevisiae*. *J. Biol. Chem.* 273: 18992-19001.
148. Stukey, J., and G.M. Carman. 1997. Identification of a novel phosphatase sequence motif. *Protein Science.* 6: 469-472.
149. Dillon, D.A., X. Chen, G.M. Zeimet, W.-I. Wu, D.W. Waggoner, J. Dewald, D.N. Brindley, and G.M. Carman. 1997. Mammalian Mg²⁺-independent phosphatidate phosphatase (PAP2) displays diacylglycerol pyrophosphate phosphatase activity. *J. Biol. Chem.* 272: 10361-10366.

150. Carman, G.M. 1997. Phosphatidate phosphatases and diacylglycerol pyrophosphate phosphatases in *Saccharomyces cerevisiae* and *Escherichia coli*. *Biochim. Biophys. Acta.* 1348: 45-55.
151. Riedel, B., M. Morr, W.-I. Wu, G.M. Carman, J.B. Wissing. 1997. Metabolism of diacylglycerol pyrophosphate by suspension cultured *Catharanthus roseus* cells. Identification and characterization of diacylglycerol pyrophosphate phosphatase in plants. *Plant Sci.* 128: 1-10.
152. Wu, W.-I., Y. Liu, B. Riedel, J.B. Wissing, A.S. Fischl, and G.M. Carman. 1996. Purification and characterization of diacylglycerol pyrophosphate phosphatase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 271: 1868-1876.
153. Wu, W.-I., and G.M. Carman. 1996. Regulation of phosphatidate phosphatase activity from the yeast *Saccharomyces cerevisiae* by phospholipids. *Biochemistry.* 35: 3790-3796.
154. Yang, W.-L., M.E.C. Bruno, and G.M. Carman. 1996. Regulation of yeast CTP synthetase activity by protein kinase C. *J. Biol. Chem.* 271: 11113-11119.
155. Carman, G.M., and G.M. Zeimet. 1996. Regulation of phospholipid biosynthesis in the yeast *Saccharomyces cerevisiae*. *J. Biol. Chem.* 271: 13292-13296.
156. Carman, G.M., R.J. Buxeda, and J.T. Nickels, Jr. 1996. Phosphatidylinositol 4-kinases in *Saccharomyces cerevisiae* in *Advances in Lipobiology* (Gross, R.W., ed.). Jai Press. Greenwich CT. 367-385.
157. Yang, W.-L., and G.M. Carman. 1996. Phosphorylation and regulation of CTP synthetase from *Saccharomyces cerevisiae* by protein kinase A. *J. Biol. Chem.* 271: 28777-28783.
158. Dillon, D.A., W.-I. Wu, B. Riedel, J.B. Wissing, W. Dowhan, and G.M. Carman. 1996. The *Escherichia coli* *pgpB* gene encodes for a diacylglycerol pyrophosphate phosphatase activity. *J. Biol. Chem.* 271: 30548-30553.
159. Wu, W.-I., V.M. McDonough, J.T. Nickels, Jr., J. Ko, A.S. Fischl, T.R. Vales, A.H. Merrill, Jr. and G.M. Carman. 1995. Regulation of lipid biosynthesis in *Saccharomyces cerevisiae* by Fumonisin B₁. *J. Biol. Chem.* 270: 13171-13178.
160. Yang, W.-L., and G.M. Carman. 1995. Phosphorylation of CTP synthetase from *Saccharomyces cerevisiae* by protein kinase C. *J. Biol. Chem.* 270: 14983-14988.
161. McDonough, V.M., R.J. Buxeda, M.E.C. Bruno, O. Ozier-Kalogeropoulos, M.-T. Adeline, C.R. McMaster, R.M. Bell, and G.M. Carman. 1995. Regulation of phospholipid biosynthesis in *Saccharomyces cerevisiae* by CTP. *J. Biol. Chem.* 270: 18774-18780.
162. Carman, G.M., R.A. Deems, and E.A. Dennis. 1995. Lipid signaling enzymes and surface dilution kinetics. *J. Biol. Chem.* 270: 18711-18714.
163. Nadkarni, A.K., V.M. McDonough, W.-L. Yang, J.E. Stukey, O. Ozier-Kalogeropoulos, and G.M. Carman. 1995. Differential biochemical regulation of the *URA7*- and *URA8*-encoded CTP synthetases from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 270: 24982-24988.

164. Ostrander, D.B., J.A. Gorman, and G.M. Carman. 1995. Regulation of profilin localization in *Saccharomyces cerevisiae* by phosphoinositide metabolism. *J. Biol. Chem.* 270: 27045-27050.
165. Ozier-Kalogeropoulos, O., M.-T. Adeline, W.-L. Yang, G.M. Carman, and F. Lacroute. 1994. Use of synthetic lethal mutants to clone and characterize a novel CTP synthetase gene in *Saccharomyces cerevisiae*. *Mol. Gen. Genet.* 242: 431-439.
166. Nickels, J.T. Jr., R.J. Buxeda, and G.M. Carman. 1994. Regulation of phosphatidylinositol 4-kinase from the yeast *Saccharomyces cerevisiae* by CDP-diacylglycerol. *J. Biol. Chem.* 269: 11019-11024.
167. Yang, W.-L, V.M. McDonough, O. Ozier-Kalogeropoulos, M.-T. Adeline, M.T. Flocco, and G.M. Carman. 1994. Purification and characterization of CTP synthetase, the product of the *URA7* gene in *Saccharomyces cerevisiae*. *Biochemistry* 33: 10785-10793.
168. Wu, W.-I., and G.M. Carman. 1994. Regulation of phosphatidate phosphatase activity from the yeast *Saccharomyces cerevisiae* by nucleotides. *J. Biol. Chem.* 269: 29495-29501.
169. Buxeda, R.J., J.T. Nickels, Jr., and G.M. Carman. 1993. Regulation of the 45- and 55-kDa forms of phosphatidylinositol 4-kinase from the yeast *Saccharomyces cerevisiae* by nucleotides. *J. Biol. Chem.* 268: 6248-6255.
170. Wu, W.-I., Y.-P. Lin, E. Wang, A.H. Merrill, Jr., and G.M. Carman. 1993. Regulation of phosphatidate phosphatase activity from the yeast *Saccharomyces cerevisiae* by sphingoid bases. *J. Biol. Chem.* 268: 13830-13837.
171. Nickels, J.T., Jr., and G.M. Carman. 1993. Photoaffinity labeling of the 45-kDa and 55-kDa forms of phosphatidylinositol 4-kinase from the yeast *Saccharomyces cerevisiae*. *J. Biol. Chem.* 268: 24083-24088.
172. Quinlan, J.J., J.T. Nickels Jr., W.-I. Wu, Y.-P. Lin, J.R. Broach, and G.M. Carman. 1992. The 45-kDa and 104-kDa forms of phosphatidate phosphatase from *Saccharomyces cerevisiae* are regulated differentially by phosphorylation via cAMP-dependent protein kinase. *J. Biol. Chem.* 267: 18013-18020.
173. Nickels, J.T. Jr., R.J. Buxeda, and G.M. Carman. 1992. Purification, characterization, and kinetic analysis of a 55-kDa form of phosphatidylinositol 4-kinase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 267: 16297-16304.
174. Carman, G.M., and M. Bae-Lee. 1992. Phosphatidylserine synthase from yeast. *Methods Enzymol.* 209: 298-305.
175. Carman, G.M., C.J. Belunis, and J.T. Nickels. 1992. Phosphatidylinositol 4-kinase from yeast. *Methods Enzymol.* 209: 183-189.
176. Carman, G.M., and A.S. Fischl. 1992. Phosphatidylinositol synthase from yeast. *Methods Enzymol.* 209: 305-312.
177. Carman, G.M., and M.J. Kelley. 1992. CDPdiacylglycerol synthase from yeast. *Methods Enzymol.* 209: 242-247.
178. Carman, G.M., and J.J. Quinlan. 1992. Phosphatidate phosphatase from yeast mitochondria. *Methods Enzymol.* 209: 219-224.

179. Morlock, K.R., J.J. McLaughlin, Y.-P. Lin, and G.M. Carman. 1991. Phosphatidate phosphatase from *Saccharomyces cerevisiae*. Isolation of 45-kDa and 104-kDa forms of the enzyme that are differentially regulated by inositol. *J. Biol. Chem.* 266: 3586-3593.
180. Buxeda, R.J., J.T. Nickels, Jr., C.J. Belunis, and G.M. Carman. 1991. Phosphatidylinositol 4-kinase from *Saccharomyces cerevisiae*. Kinetic analysis using Triton X-100/phosphatidylinositol mixed micelles. *J. Biol. Chem.* 266: 13859-13865.
181. Kent, C., G.M. Carman, M.W. Spence, and W. Dowhan. 1991. Regulation of eukaryotic phospholipid metabolism. *FASEB J.* 5: 2258-2266.
182. Gaynor, P.M., T. Gill, S. Toutenhoofd, E.F. Summers, P. McGraw, M.J. Homann, S.A. Henry, and G.M. Carman. 1991. Regulation of phosphatidylethanolamine methyltransferase and phospholipid methyltransferase by phospholipid precursors in *Saccharomyces cerevisiae*. *Biochim. Biophys. Acta* 1090: 326-332.
183. Carman, G.M., and Y.-P. Lin. 1991. Phosphatidate phosphatase from yeast. *Methods Enzymol.* 197: 548-553.
184. Lin, Y.-P., and G.M. Carman. 1990. Kinetic analysis of yeast phosphatidate phosphatase toward Triton X-100/phosphatidate mixed micelles. *J. Biol. Chem.* 265: 166-170.
185. Kinney, A.J., M. Bae-Lee, S. Singh Panghaal, M.J. Kelley, P. M. Gaynor, and G.M. Carman. 1990. Regulation of phospholipid biosynthesis in *Saccharomyces cerevisiae* by cyclic AMP- dependent protein kinase. *J. Bacteriol.* 172: 1133-1136.
186. Gaynor, P.M., and G.M. Carman. 1990. Phosphatidylethanolamine methyltransferase and phospholipid methyltransferase activities from *Saccharomyces cerevisiae*. Enzymological and kinetic properties. *Biochim. Biophys. Acta* 1045:156-163.
187. Bae-Lee, M., and G.M. Carman. 1990. Regulation of yeast phosphatidylserine synthase and phosphatidylinositol synthase activities by phospholipids in Triton X- 100/phospholipid mixed micelles. *J. Biol. Chem.* 265: 7221-7226.
188. Kinney, A.J., and G.M. Carman. 1990. Enzymes of phosphoinositide synthesis in secretory vesicles destined for the plasma membrane in *Saccharomyces cerevisiae*. *J. Bacteriol.* 172: 4115-4117.
189. Lin, Y.-P., and G.M. Carman. 1989. Purification and characterization of phosphatidate phosphatase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 264: 8641-8645.
190. Carman, G.M., and S.A. Henry. 1989. Phospholipid biosynthesis in yeast. *Ann. Rev. Biochem.* 58: 635-669.
191. Radcliffe, C.W., F.X. Steiner, G.M. Carman, and R.A. Niederman. 1989. Characterization and localization of phosphatidylglycerophosphate and phosphatidylserine synthases in *Rhodobacter sphaeroides*. *Arch. Microbiol.* 152: 132-137.
192. Bonnel, S.I., Y.-P. Lin, M.J. Kelley, G.M. Carman, and J. Eichberg. 1989. Interaction of thiophosphatidic acid with enzymes which metabolize phosphatidic acid. Inhibition of phosphatidic acid phosphatase and utilization by CDP- diacylglycerol synthase. *Biochim. Biophys. Acta* 1005: 289- 295.
193. Carman, G.M. 1989. Phosphatidylcholine metabolism in *Saccharomyces cerevisiae*. In *Phosphatidylcholine metabolism* (Vance, D.E., ed.), CRC Press, Inc. Boca Raton, FL. 165-184.

194. Holland, K.M., M.J. Homann, C.J. Belunis, and G.M. Carman. 1988. Regulation of phosphatidylinositol kinase activity in *Saccharomyces cerevisiae*. *J. Bacteriol.* 170: 828-833.
195. Klig, L.S., M.J. Homann, S.D. Kohlwein, M.J. Kelley, S.A. Henry, and G.M. Carman. 1988. *Saccharomyces cerevisiae* mutant with a partial defect in the synthesis of CDP-diacylglycerol and altered regulation of phospholipid biosynthesis. *J. Bacteriol.* 170: 1878-1886.
196. Morlock, K.R., Y.-P. Lin, and G.M. Carman. 1988. Regulation of phosphatidate phosphatase activity by inositol in *Saccharomyces cerevisiae*. *J. Bacteriol.* 170: 3561-3566.
197. Kelley, M.J., A.M. Bailis, S.A. Henry, and G.M. Carman. 1988. Regulation of phospholipid biosynthesis in *Saccharomyces cerevisiae* by inositol. Inositol is an inhibitor of phosphatidylserine synthase activity. *J. Biol. Chem.* 263: 18078-18085.
198. Kinney, A.J., and G.M. Carman. 1988. Phosphorylation of yeast phosphatidylserine synthase *in vivo* and *in vitro* by cyclic AMP-dependent protein kinase. *Proc. Natl. Acad. Sci.* 85: 7962-7966.
199. Belunis, C.J., M. Bae-Lee, M.J. Kelley, and G.M. Carman. 1988. Purification and characterization of phosphatidylinositol kinase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 263: 18897-18903.
200. Bailis, A.M., M.A. Poole, G.M. Carman, and S.A. Henry. 1987. The membrane-associated enzyme phosphatidylserine synthase of yeast is regulated at the level of mRNA abundance. *Mol. Cell. Biol.* 7: 167-176.
201. Homann, M.J. M.A. Poole, P.M. Gaynor, C.-T. Ho, and G.M. Carman. 1987. Effect of growth phase on phospholipid biosynthesis in *Saccharomyces cerevisiae*. *J. Bacteriol.* 169: 533-539.
202. Homann, M.J., A.M. Bailis, S.A. Henry, and Carman, G.M. 1987. Coordinate regulation of phospholipid biosynthesis by serine in *Saccharomyces cerevisiae*. *J. Bacteriol.* 169: 3276-3280.
203. Raetz, C.R.H., Carman, G.M., Dowhan, W., Jiang, R-T., Waszkuc, W., Loffredo, W., and Tsai, M-D. 1987. Phospholipids chiral at phosphorus. Steric course of the reactions catalyzed by phosphatidylserine synthase from *Escherichia coli* and yeast. *Biochemistry* 26: 4022-4027.
204. Kelley, M.J., and G.M. Carman. 1987. Purification and characterization of CDP-diacylglycerol synthase from *Saccharomyces cerevisiae*. *J. Biol. Chem.* 262: 14563-14570.
205. Fischl, A.S., M.J. Homann, M.A. Poole, and G.M. Carman. 1986. Phosphatidylinositol synthase from *Saccharomyces cerevisiae*. Reconstitution, characterization, and regulation of activity. *J. Biol. Chem.* 261: 3178-3183.
206. Poole, M.A., M.J. Homann, M. Bae-Lee, and G.M. Carman. 1986. Regulation of phosphatidylserine synthase from *Saccharomyces cerevisiae* by phospholipid precursors. *J. Bacteriol.* 168: 668-672.

207. Fernandez, S., M.J. Homann, S.A. Henry, and G.M. Carman. 1986. Metabolism of the phospholipid precursor inositol and its relationship to growth and viability in the natural auxotroph *Schizosaccharomyces pombe*. *J. Bacteriol.* 166: 779-786.
208. Hromy, J.M., and G.M. Carman. 1986. Reconstitution of *Saccharomyces cerevisiae* phosphatidylserine synthase into phospholipid vesicles. Modulation of activity by phospholipids. *J. Biol. Chem.* 261: 15572-15576.
209. Henry, S.A., D. Hoshizaki, A. Bailis, M.J. Homann, and G.M. Carman. 1986. Genetic regulation of phospholipid synthesis in yeast. In *Enzymes of lipid metabolism II. Proceedings of the CNRS-INSERM International Symposium and Nato Workshop.* (Freysz, L., H. Dreyfus, R. Massarelli, and S. Gatt, eds.), Plenum Publishing Corp., New York, NY. 623-632.
210. Page, G.V., M. Solberg, and G.M. Carman. 1985. Nitrite reductase in *Salmonella typhimurium*. *J. Food Safety* 7: 1-13.
211. Klig, L.S., M.J. Homann, G.M. Carman, and S.A. Henry. 1985. Coordinate regulation of phospholipid biosynthesis in *Saccharomyces cerevisiae*: pleiotropically constitutive *opi1* mutant. *J. Bacteriol.* 162: 1135-1141.
212. Poole, M.A., A.S. Fischl, and G.M. Carman. 1985. Enzymatic detection of phospholipid biosynthetic enzymes after electroblotting. *J. Bacteriol.* 161: 772-774.
213. Cirigliano, M.C., and G.M. Carman. 1985. Purification and characterization of Liposan, a bioemulsifier from *Candida lipolytica*. *Appl. Environ. Microbiol.* 50: 846-850.
214. Homann, M.J., S.A. Henry, and G.M. Carman. 1985. Regulation of CDP-diacylglycerol synthase activity in *Saccharomyces cerevisiae*. *J. Bacteriol.* 163: 1265-1266.
215. Carman, G.M., and A.S. Greenberg. 1984. Membrane-associated phosphatidylglycerophosphate synthase from germinating soybeans. *J. Food Biochem.* 8: 321-333.
216. Bae-Lee, M., and G.M. Carman. 1984. Phosphatidylserine synthesis in *Saccharomyces cerevisiae*. Purification and characterization of membrane-associated phosphatidylserine synthase. *J. Biol. Chem.* 259: 10857-10862.
217. Cirigliano, M.C., and G.M. Carman. 1984. Isolation of a bioemulsifier from *Candida lipolytica*. *Appl. Environ. Microbiol.* 48: 747-750.
218. Fischl, A.S., and G.M. Carman. 1983. Phosphatidylinositol biosynthesis in *Saccharomyces cerevisiae*: purification and properties of microsome-associated phosphatidylinositol synthase. *J. Bacteriol.* 154: 304-311.
219. McKenzie, M.A., and G.M. Carman. 1983. Membrane-associated phosphatidylinositol kinase from *Saccharomyces cerevisiae*. *J. Bacteriol.* 156: 421-423.
220. Letts, V.A., L.S. Klig, M. Bae-Lee, G.M. Carman, and S.A. Henry. 1983. Isolation of the yeast structural gene for the membrane-associated enzyme; phosphatidylserine synthase. *Proc. Natl. Acad. Sci.* 80: 3715-3720.
221. Carman, G.M., and C.J. Belunis. 1983. Phosphatidylglycerophosphate synthase activity in *Saccharomyces cerevisiae*. *Can. J. Microbiol.* 29: 1452-1457.

222. Cirigliano, M.S., and G.M. Carman. 1983. A plating technique for the selective isolation of yeast utilizing water immiscible carbon. *J. Food Sci.* 48: 1554-1555.
223. Homann, M.J., and G.M. Carman. 1983. Detection of phospholipid biosynthetic enzyme activities in *Saccharomyces cerevisiae* by colony autoradiography. *Anal. Biochem.* 135: 447-452.
224. Robinson, M.L., and G.M. Carman. 1982. Solubilization of microsomal-associated phosphatidylinositol synthase from germinating soybeans. *Plant Physiol.* 69: 146-149.
225. Carman, G.M., R.L. Zaniewski, and J.J. Cousminer. 1982. CDP- diacylglycerol synthase activity in *Clostridium perfringens*. *Appl. Environ. Microbiol.* 43: 81-85.
226. McKenzie, M.A., and G.M. Carman. 1982. Solubilization of membrane-associated phosphatidylinositol kinase from *Saccharomyces cerevisiae*. *J. Food Biochem.* 6: 77-86.
227. Cousminer, J.J., A.S. Fischl, and G.M. Carman. 1982. Partial purification and properties of phosphatidylserine synthase from *Clostridium perfringens*. *J. Bacteriol.* 151: 1372-1379.
228. Carman, G.M., G.F. Harrington, and R. Amegah. 1981. Microsomal- associated glycerolphosphate acyltransferase activity in germinating soybeans. *J. Food Biochem.* 5: 185-195.
229. Carman, G.M., and J. Matas. 1981. Solubilization of microsomal-associated phosphatidylserine synthase and phosphatidylinositol synthase from *Saccharomyces cerevisiae*. *Can. J. Microbiol.* 27: 1140-1149.
230. Carman, G.M., A.S. Fischl, M. Dougherty, and G. Maerker. 1981. A spectrophotometric method for the assay of phospholipase D activity. *Anal. Biochem.* 110: 73-76.
231. Cousminer, J.J., and G.M. Carman. 1981. Solubilization of membrane-associated phosphatidylserine synthase from *Clostridium perfringens*. *Can. J. Microbiol.* 27: 544-546.
232. Carman, G.M., and D.S. Wiecezorek. 1980. Phosphatidylglycerophosphate synthase and phosphatidylserine synthase activities in *Clostridium perfringens*. *J. Bacteriol.* 142: 262-267.
233. Carman, G.M., and A.S. Fischl. 1980. Modification of the Agranoff-Suomi method for the synthesis of CDP- diacylglycerol. *J. Food Biochem.* 4: 53-59.
234. Carman, G.M., and M. Dougherty. 1980. Kinetic properties of phosphatidylinositol synthase from germinating soybeans. *J. Food Biochem.* 4: 147-152.
235. Carman, G.M., and M. Dougherty. 1980. Subcellular localization of phosphatidylinositol synthase from germinating soybeans. *J. Food Biochem.* 4: 153-158.
236. Carman, G.M., R. Amegah, and J. Matas. 1980. Mitochondrial- associated CDP- diacylglycerol synthase activity in germinating soybeans. *J. Food Biochem.* 4: 261-272.
237. Carman, G.M., and W. Dowhan. 1979. Phosphatidylserine synthase of *Escherichia coli*. The role of Triton X-100 in catalysis. *J. Biol. Chem.* 254: 8391-8397.
238. Carman, G.M., and S.M. Felder. 1979. A phosphatidylinositol synthase activity from germinating soybean seeds. *J. Food Biochem.* 3: 89-102.

239. Carman, G.M., and W. Dowhan. 1978. A spectrophotometric method for the assay of cytidine 5'diphospho-1,2-diacyl-sn- glycerol dependent enzymes of phospholipid metabolism. *J. Lipid Res.* 19: 519-522.
240. Carman, G.M., and R.E. Levin. 1977. Partial purification and some properties of tyrosine phenol-lyase from *Aeromonas phenologenes* ATCC 29063. *Appl. Environ. Microbiol.* 33: 192-198.
241. Carman, G.M., and R.E. Levin. 1977. Characteristics of tyrosine phenol-lyase from *Aeromonas phenologenes* ATCC 29063. *J. Food Biochem.* 1: 285-299.