

**Harvard Medical School
Curriculum Vitae**

Date Prepared: Jan 26, 2018

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Education

1991-1995	B.A.	Chemistry	Brandeis University
1995-1999	Ph.D.	Chemistry (PI: John Allison)	Michigan State University

Postdoctoral Training

1999-2002	Research Scientist	Proteomics (PI: William S. Lane)	Harvard University
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Faculty Academic Appointments

2005-2008	Instructor	Dept. of Pathology	Harvard Medical School
2009-2009	Instructor	Dept. of Medicine	Harvard Medical School
2010-Present	Assistant Professor	Dept. of Medicine	Harvard Medical School
2017-Present	Associate Professor	Dept. of Medicine	Harvard Medical School

Other Professional Positions

2002-2004	Scientist	Beyond Genomics, Inc.
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Major Administrative Leadership Positions

2004-Present	Director	Mass Spectrometry Core	Beth Israel Deaconess Medical Center
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Professional Societies

1995-Present	American Chemical Society	Member
1996-Present	American Society for Mass Spectrometry	Member
2000-Present	Association of Biomolecular Resource Facilities (ABRF)	Member
2011-2015	Metabolomics Research Group for ABRF	Member
2007-Present	American Association for the Advancement of Science	Member
2008-Present	Human Proteome Organization	Delegate
2011-Present	American Association for Cancer Research	Member
2014-Present	Metabolomics Society	Member
2016-Present	SCIEX Innovation Advisory Board	Advisor
2017-Present	Metabolomics Association of North America	Advisory Board

Grant Review Activities

- 2016 National Science Foundation Research Proposal
-CAREER: Discovering Upstream Effectors to Cell Fate Determination
- 2017 Harvard Catalyst Reactor Program The Harvard Clinical and Translational Science Center
-Review pilot grants advance the design, development, and evaluation of novel targeted secretion inhibitors (TSIs) for their potential application in oncology, endocrinology, neurology, or pain management
- 2017 Barts Charity, London UK Strategic Research Grant Proposal
-Creating a facility for Metabolic flux analysis

Editorial Activities

- Ad hoc Reviewer

Science Magazine

Analytical Chemistry

Journal of Proteome Research

Proteomics

Cancer Research

Molecular Systems Biology

Scientific Reports

Medicinal Research Reviews

Molecular Biosystems
Metabolomics
Nature Protocols
Molecular Cancer Therapeutics
Protein Science
PLoS ONE
Proceedings of the National Academy of Sciences
Protein Science
Future Oncology
Medicinal Research Reviews
Cell Metabolism
Expert Opinion on Therapeutic Targets

- Other Editorial Roles

2010-Present	Faculty Member, Biology	<i>Faculty of 1000</i>
2015-Present	Editorial Board Member	<i>Trends in Proteomics and Bioinformatics</i>
2016-Present	Editorial Board Member	<i>Biointerface Research in Applied Chemistry</i>
2017-Present	Editorial Board Member	<i>Annals of Proteomics and Bioinformatics</i>
2017-Present	Editorial Board Member	<i>International Journal of Genomics, Proteomics, Metabolomics & Bioinformatics</i>
2017-Present	Editorial Board Member	<i>Archives of Organic and Inorganic Chemical Sciences</i>
2018-Present	Editorial Board Member	<i>Current Trends in Metabolomics</i>

Honors and Prizes

1994-1995	Undergraduate Fellowship	Brandeis University
1996	Roses Award in Teaching	Michigan State University
1998-1999	Tulinsky Endowed Fellowship	Michigan State University
2005	Outstanding Scientist Travel Award	Association of Biomolecular Resource Facilities
2007	Ranked #10 of the 100 Top Scientific Discoveries of the Year	Discover Magazine
2009	Young Investigator Award	Human Proteome Organization
2010	Outstanding Poster Award	Association of Biomolecular Resource Facilities

2010	Faculty Member, Biology (Signal Transduction)	Faculty of 1000
2012	Shared Instrumentation Award	National Institutes of Health
2014	Capital Equipment Award	Beth Israel Deaconess Med Ctr
2015	Academic Partnership Award	AB/SCIEX

Report of Funded and Unfunded Projects

Past Funding:

2007-2009	Principal Investigator	NSF 0634136	\$112,736
	<i>SGER: A Method to Sequence Novel Peptides from Unsequenced Taxa: Soft tissue of the 68M Year Old Tyrannosaurus rex</i>		
	<ul style="list-style-type: none"> Developed a mass spectrometry and informatics based method using ion trap technology to sequence novel peptide sequences from a well-preserved <i>T. rex</i> fossil bone 		
2012-2013	Principal Investigator	NIH 1S10OD010612	\$599,926
	<i>SIG: LTQ Orbitrap Elite Mass Spectrometer System</i>		
	<ul style="list-style-type: none"> Acquire a new generation and state-of-the art ultra-high resolution/high mass accuracy mass spectrometer for cancer research 		
2014-2016	Co-Investigator	BIDMC CAO Pilot Grant Award	\$100,000
	<i>A novel multimodal molecular imaging of BRAFV600E-targeted therapy with vemurafenib in preclinical and translational models of human papillary thyroid cancer</i>		
	<ul style="list-style-type: none"> Developed mass spectrometry applications for phosphopeptide detection and quantification, protein-protein interactions as well as metabolomics targeted analyses from mouse models and cell lines 		
2015-2016	Site Co-Investigator	NIH R01CA18139002	\$28,142
	<i>Metabolic Control of Cell Growth by the MTOR Signaling Network</i>		
	<ul style="list-style-type: none"> Development of metabolomics and lipidomics technologies including stable isotope labeling strategies in the mTOR signaling pathway in cancers 		

Current Funding:

2005-2018	Site Director/Investigator	BIDMC 01099980	\$310,000
	<i>Development and Implementation of a Multi-Omics Mass Spectrometry Core Facility</i>		
	<ul style="list-style-type: none"> Development of new technologies and services for a mass spectrometry core serving the Longwood medical area and HMS community for lipidomics, proteomics and metabolomics analyses 		
2008-2018	Site Principal Investigator	NIH 5P01CA120964	\$172,953

Molecular Pathogenesis of the Hamartoma Syndromes-Core B: Mass Spectrometry, Proteomics and Metabolomics Core

- Support three cancer signaling projects studying Hamartoma syndromes and develop new mass spectrometry based strategies including metabolomics and proteomics for studying signal transduction

2009-2020	Site Co-Investigator	NIH 5P30CA006516	\$244,883
	<i>Cancer Center Support Grant: Cancer Proteomics Core</i>		
	<ul style="list-style-type: none">• Develop proteomics technologies to assist cancer researchers who are members of the Dana-Farber Harvard Cancer Center		
2014-2019	Site Co-Investigator	NIH R35CA19745902	\$125,500
	<i>Decoding and Targeting the PI3K-mTor Signaling Network in Cancer</i>		
	<ul style="list-style-type: none">• Development of metabolomics and lipidomics technologies including stable isotope labeling strategies in the mTOR signaling pathway in cancers		
2016-2020	Site Co-Investigator	NIH 1R01AG051658	\$117,000
	<i>Advancing the Understanding of Postoperative Delirium Mechanisms via Multi-Omics</i>		
	<ul style="list-style-type: none">• Develop and implement proteomic, metabolomic and lipidomic technologies from plasma of delirium patient populations for understanding pathway dysregulation in		

Unfunded projects:

A Systems Biology Approach to Dissecting the Topology of the Insulin Signaling Network

- Uncover the protein-protein interaction network of the insulin signaling pathway by comparing immunoprecipitation-mass spectrometry bait-prey experiments from drosophila and human cancer cells

Proteomics and Molecular Phylogenetics of Ancient Fossil Bones

- Develop improved methods for sequencing ancient fossil material by mass spectrometry from several extinct and extant organisms and extend the ancient phylogenetic tree using bone and vessel protein data

Development of a Mass Spectrometry Based Lipidomics Platform to Study Human Disease

- Develop and implement quantitative lipidomics technology using a newly acquired high resolution mass spectrometer (QExactive Plus)

Report of Local Teaching and Training

Teaching of Students in Courses

2009-2014	Proteomics Nanocourse	Harvard Catalyst
	Open to faculty, students and staff	Four hours per year

Formal Teaching of Residents, Clinical Fellows and Research Fellows

2010-Present Small Molecule Mass Spectrometry Training Beth Israel Deaconess Medical Center
HMS-affiliated postdocs Thirty-five hours per year

Laboratory and Research Supervisory and Training

2005-Present Supervisor Beth Israel Deaconess Medical Center
Twelve hours per week
-Teaching activities involve training our staff in addition to students and post-doctoral research fellows from laboratories of collaborating investigators. Researchers are trained on the fundamental aspects of mass spectrometry (proteomics, metabolomics and lipidomics), sample preparation, instrumental analysis and data processing for biomedical applications.

Formally Supervised Trainees

2005 Robert Dorkin, Ph.D., Research Assistant (currently at CRISPR Therapeutics, Somerville, MA)
-Robert helped to implement protocols for mass spectrometry service on proteins for protein identification and quantification as well as PTM mapping

2005-2008 Lisa Freimark, M.S., Research Associate (currently at Broad Institute, Cambridge MA)
-Lisa helped to develop mass spectrometry sample preparation strategies for proteomics applications including relative quantification and PTM identification resulting in five peer reviewed publications

2007 – 2011 Shailender Nagpal, M.S., visiting scholar (currently at www.bioinformatics.net, Upton, MA)
-Shailender developed bioinformatics algorithms and software to analyze label-free proteomics datasets and novel sequences resulting two peer reviewed publications

2007 - 2010 Xuemei Yang, M.S., Sr. Research Associate (currently at Merck & Co., Boston, MA)
-Xuemei studied protein-protein interactions in signaling pathways and developed strategies to study protein complexes in the PI3K pathway using mass spectrometry, resulting in seven peer reviewed publications including two first authorships

2010 – Present Susanne B. Breitkopf, Ph.D., Postdoctoral Research Fellow (currently at Pfizer, Inc., Cambridge, MA)
-Susanne developed technological platforms and used mass spectrometry to study signaling networks in cancer via proteomics, phosphoproteomics, lipidomics and metabolomics, resulting in nine peer reviewed publications including six first authorships

2011- Present Min Yuan, M.S., Sr. Research Associate
-Min is performing method development and implementing strategies for various aspects of lipidomics, metabolomics and proteomics in cancers, resulting in thirteen

peer reviewed publications including one first authorship

- 2015 - 2016 Ying Xu, Ph.D., Postdoctoral Research Fellow (currently at Nuclear Biotechnologies, Boston, MA)
-Ying helped develop our current lipidomics platform that is used for many cancer biomarker studies, resulting in one peer reviewed publication
- 2017- Present He Huang, Ph.D., Postdoctoral Research Fellow
-He is developing technologies for labeled metabolic and lipidomics flux for biomarker discovery in cancers

Local Invited Presentations

- 2006 *Qualitative and Quantitative Proteomics Strategies in Cellular Signaling using LC/MS/MS*
Dept. of Surgery
Beth Israel Deaconess Medical Center
- 2009 *Mass Spectrometry Methods and Applications to Cancer Biology*
Dept. of Cancer Biology
Beth Israel Deaconess Medical Center
- 2010 *From Fossil Bones to Functional Assays in Cancer: Mass Spectrometry is an Indispensable Tool*
Research & Academic Affairs
Beth Israel Deaconess Medical Center
- 2011 *Mass Spectrometry in the Cretaceous*
Mass Spectrometry & Chromatography User's Group
Harvard University

Report of Regional, National and International Invited Teaching and Presentations

Regional:

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

- 2007 *Using an LTQ Ion Trap and Orbitrap to Sequence and Assess the Phylogeny of Ancient Dinosaur Fossils*
Thermo Scientific Corporation User's Meeting
Cambridge, MA
- 2009 *Proteomics in the Cretaceous*
Northeastern University
Department of Biology
Boston, MA
- 2010 *Proteomics in the Cretaceous*

Accelaron Pharma
Greater Boston Mass Spectrometry Discussion Group
Cambridge, MA

- 2010 *A Platform for Quantifying Cancer Cell Metabolism*
Applied Biosystems / SCIEX
Cambridge, MA
- 2013 *Using ¹³C and ¹⁵N Isotopomer Metabolic Flux via Glucose and Glutamine to Understand Cancer's Metabolic Dependencies by SRM-LC-MS/MS*
Genzyme
Framingham, MA

National:

- 2007 *TiO₂ and its Application to Phosphorylation in Cell Signaling Pathways*
Association of Biomolecular Resource Facilities/Perkin Elmer
Tampa, Florida
- 2008 *Dinosaur Molecules and Their Evolutionary Tale* (Plenary session)
Association of Biomolecular Resource Facilities
Salt Lake City, Utah
- 2008 *Dinosaur Sequences and Their Evolutionary Tale*
American Society for Mass Spectrometry
Denver, Colorado
- 2010 *A Platform for Quantifying Cancer Cell Metabolism*
U.S. Human Proteome Organization
Denver, Colorado
- 2010 *Getting the Best Data from your Proteomics Core: Facility Proteomics Strategies and Workflows*
Association of Biomolecular Resource Facilities
Sacramento, California
- 2010 *Proteomics in the Cretaceous*
American Chemical Society (Eastern New York Section)
Albany, NY
- 2010 *A Targeted Protein-Protein "Interact-ome" of Components in the Insulin Signaling Pathway in Drosophila and Compared to Human Cancer Cells*
American Society for Mass Spectrometry
Salt Lake City, Utah
- 2011 *Using Tandem Mass Spectrometry to Choose Appropriate Kinase Inhibitor Drugs in Cancers: A Personalized Medicine Approach Based on Protein-Protein Interactions (PPI)*
American Society for Mass Spectrometry
Denver, Colorado

- 2012 *Fluxing Through Cancer: Tracking the Fate of ¹³C Labeled Energy Sources Glucose and Glutamine in Cancer Cells and Mouse Tumors*
U.S. Human Proteome Organization
San Francisco, California
- 2012 *Fluxing Through Cancer: Tracking the Fate of ¹³C Labeled Energy Sources Glucose and Glutamine in Cancer Cells and Mouse Tumors*
American Society for Mass Spectrometry
Vancouver, Canada
- 2013 *Using ¹³C and ¹⁵N Isotopomer Metabolic Flux via Glucose and Glutamine to Understand Cancer's Metabolic Dependencies by SRM-LC-MS/MS*
American Society for Mass Spectrometry
Minneapolis, Minnesota
- 2014 *CrossOmics: Integrating Quantitative Phosphoproteomics and Metabolomic Flux to Study Drug Effects on Cancer Cells*
Association of Biomolecular Resource Facilities
Albuquerque, New Mexico
- 2014 *Cross-Omics: Global Phosphoproteomics and Metabolomics Reveals a Connection Between Kinase Inhibition and RNA Processing in BCR-ABL H929 Myeloma Cells*
American Society for Mass Spectrometry
Baltimore, Maryland
- 2015 *Small Molecules in a Core Setting: Targeted Metabolic Flux to Untargeted Lipidomics*
Association of Biomolecular Resource Facilities
St. Louis, Missouri
- 2015-Present *Metabolomics/Lipidomics Workshop Training Course*
Association of Biomolecular Resource Facilities
- 2016 *Preparing Biological Samples for Metabolomics and Lipidomics, Can We Start with Just One Sample?*
Association of Biomolecular Resource Facilities
Ft. Lauderdale, Florida
- 2016 *A Quantitative Positive/Negative Switching Method for Shotgun Lipidomics via High Resolution LC-MS/MS from any Biological Source*
American Society for Mass Spectrometry
San Antonio, Texas
- 2016 *Metabolomics and Lipidomics in Cancer Research*
3rd Metabolomics: Advances & Applications in Human Disease
GTCBio
Cambridge, MA
- 2016 *Dealing with Lipid ID and Informatics in the Triome Era*
American Society for Mass Spectrometry

San Antonio, Texas

2017 *Lipidomics in Systems Biology – Untargeted Pos/Neg Switching LC-MS/MS Platform*
Association of Biomolecular Resource Facilities
San Diego, California

International:

2008 *Splitless nano-LC Technology for Biomolecular Research: Proteomics to Fossilomics*
Human Proteome Organization World Congress
Amsterdam, Netherlands

2008 *Dinosaur Sequences and Their Evolutionary Tale*
London Biological Mass Spectrometry Discussion Group
London, England

2009 *A Targeted Protein-Protein “Interact-ome” of the Insulin Signaling Pathway in Drosophila and Compared to Human Cells*
Human Proteome Organization World Congress
Toronto, Canada

2012 *Fluxing Through Cancer: Tracking the Fate of ¹³C Labeled Energy Sources Glucose and Glutamine in Cancer Cells and Mouse Tumors*
Human Proteome Organization World Congress
Boston, MA

Report of Technological and Other Scientific Innovations

US Patent 20140193920 A1

7/10/2014

Metabolomics of human biological fluids identify signatures of malignant glioma

-A method of identifying a patient in need of therapy to treat a malignant glioma comprising measuring a panel of polar metabolite levels in a biological sample taken from the patient and implementing a therapy to treat the malignant glioma in the patient.

Report of Education of Patients and Service to the Community

Activities:

2013-2017 Local High School Mass Spectrometry Technology Overview course

Report of Scholarship:

Peer-Reviewed Scholarship in print or other media:

1. **Asara, J.M.;** Uzelmeier, C.E.; Dunbar, K.R.; Allison, J. Analysis of transition-metal compounds containing tetrathiafulvalene phosphine ligands by fast atom bombardment mass spectrometry:

limitations and the development of matrix additives for the desorption of multiply charged complexes. *Inorg. Chem.* 1998;37:1833-40.

2. **Asara, J.M.**; Allison, J. Enhanced detection of phosphopeptides in matrix-assisted laser desorption/ionization mass spectrometry using ammonium salts. *J. Am. Soc. Mass Spectrom.* 1999;10:35-44.
3. **Asara, J.M.**; Allison, J. Enhanced detection of oligonucleotides in UV MALDI MS using the tetraamine spermine as a matrix additive. *Anal. Chem.* 1999;71:2866-70.
4. **Asara, J.M.**; Hess, J.S.; Lozada, E.; Dunbar, K.R.; Allison, J. Evidence for binding of dirhodium acetate units to adjacent GG and AA sites on single-stranded DNA. *J. Am. Chem. Soc.* 2000;122:8-13.
5. Oh, M.-H.; Huber, S.; **Asara, J.M.**; Gage, D.A.; Clouse, S. Putative phosphorylation recognition sequences of the arabidopsis Bril receptor kinase. *Plant Phys.* 2000, 124:751-65.
6. Ivan, M.; Kondo K.; Yang, H.F.; Kim, W.; Valiando, J.; Ohh, M.; Salic, A.; **Asara, J.M.**; Lane, W.S.; Kaelin, W.G. HIF α targeted for VHL-mediated destruction by proline hydroxylation: implications for O₂ sensing. *Science.* 2001;292:464-68.
7. Kane, S.; Sano, H.; Liu, S.C.H.; **Asara, J.M.**; Lane, W.S.; Garner, C.C.; Lienhard, G.E. a new method to identify serine kinase substrates: Akt phosphorylates a novel adipocyte protein with a Rab gap domain. *J. Biol. Chem.* 2002;277:22115-118.
8. Schweitzer, M.H.; Hill, C.H.; Chiappe, L.M.; **Asara, J.M.**; Lane, W.S.; Pincus, S.H. Identification of immunoreactive material in mammoth fossils. *J. Mol. Evol.* 2002;55:696-705.
9. Sano, H; Kane, S; Sano, E; Miinea, C.P.; **Asara, J.M.**; Lane, W.S.; Garner, C.W.; Lienhard, G.E. Insulin-stimulated phosphorylation of a Rab GTPase-activating protein regulates GLUT4 translocation. *J. Biol. Chem.* 2003;278:14599-602.
10. Levine, M.Z.; Sanchez, C.C.; Wilkins, P.P.; Lane, W.S.; **Asara, J.M.**; Hancock, K.; Gonzalez, A.E.; Garcia, H.H.; Gilman, R.H.; Tsang, V.C.W. Characterization, cloning and expression of two diagnostic antigens for *Taenia solium*. tapeworm infection. *J. Parasitol.* 2004;90:631-38.
11. Abbott, D.A.; Wilkins, A.; **Asara, J.M.**; Cantley, L.C. The Crohn's disease gene, NOD2, requires RIP2 to induce ubiquitylation of a novel site on NEMO. *Curr. Biol.* 2004;14:2217-27.
12. Zhang, X.; Hines, W.; Adamec, J.; **Asara, J.M.**; Naylor, S.; Regnier, F.E. An automated method for the analysis of stable-isotope labeling data in proteomics. *J. Am. Soc. Mass Spectrom.* 2005;16:1181-91.
13. Zhang, X; **Asara, J.M.**; Adamec, J; Ouzzani, M; Elmagarmid, A.K. Data pre-processing in liquid chromatography-mass spectrometry based proteomics. *Bioinformatics.* 2005;21:4054-4059.
14. **Asara, J.M.**; Zhang, X.; Zheng, B.; Christofk, H.H.; Wu, N.; Cantley, L.C. In-gel stable isotope labeling (ISIL): A strategy for mass spectrometry-based relative quantification. *J. Proteome Res.* 2006; 5:155-163.

15. **Asara, J.M.**; Zhang, X.; Zheng, B.; Maroney, L.A.; Christofk, H.R.; Wu, N.; Cantley, L.C. In-gel stable isotope labeling for relative quantification by mass spectrometry. *Nature Protoc.* 2006;1:46-51.
16. **Asara, J.M.**; Schweitzer, M.H.; Freemark, L.M.; Phillips, M.; Cantley, L.C. Protein sequences from Mastodon and *Tyrannosaurus rex* revealed by mass spectrometry. *Science.* 2007;316:280-285.
17. Schweitzer, M.H.; Suo, Z.; Avci, R.; **Asara, J.M.**; Allen, M.A.; Arce, F.T.; Horner, J.R. Analysis of soft tissue from *Tyrannosaurus rex* suggest the presence of protein. *Science.* 2007;316:277-280.
18. Hutti, JE, Turk, BE, **Asara, JM**, Ma, A, Cantley, LC, and Abbott, DW A screen for IKKB substrates identifies IKKB-mediated phosphorylation of A20 as a mechanism of feedback inhibition in the NFkB pathway. *Mol Cell Biol.* 2007;27:7451-61.
19. Zinkin, N.T.; Grall, F.; Bhaskar, K.; Otu, H.H.; Spentzos, D.; Kalmowitz, B.; Wells, M.; Guerrero, M.; **Asara, J.M.**; Libermann, T.A.; Afdhal, N.H. Serum Proteomics and Biomarkers in Hepatocellular Carcinoma and Chronic Liver Disease. *Clin. Cancer. Res.* 2008;14:470-477.
20. **Asara, J.M.**; Christofk, H.R.; Freemark, L.M.; Cantley, L.C. Label-free relative quantification by MS/MS TIC compared to stable-isotope labeling and spectral counting in a proteomics screen. *Proteomics.* 2008;8:994-999.
21. Christofk, H.R.; Vander Heiden, M.V.; Wu, N.; **Asara, J.M.**; Cantley, L.C. Pyruvate kinase M2 is a novel phosphotyrosine binding protein. *Nature.* 2008;452:181-186.
22. Organ, C.L.; Schweitzer, M.H.; Zheng, W.; Freemark, L.M.; Cantley, L.C.; **Asara, J.M.** Molecular phylogenetics of Mastodon and *Tyrannosaurus rex*. *Science.* 2008;320:499.
23. Clements, R.T.; Smejkal, G.; Sodha, N.R.; Ivanov, A.R.; **Asara, J.M.**; Feng, J.; Lazarev, A.; Senthilnathan, V.; Khabbaz, K.R.; Bianchi, C.; Sellke, F.W. Proteomic profile of differentially regulated proteins in human myocardium before and after cardiac surgery utilizing cardioplegia and cardiopulmonary bypass. *Circulation*, 2008;30:118.
24. Zheng, B.; Jeong, J.H.; **Asara, J.M.**; Yuan, Y.Y.; Granter, S.R.; Chin, L.; Cantley, L.C. Oncogenic B-RAF negatively regulates the tumor suppressor LKB1 to promote melanoma cell proliferation. *Mol. Cell*, 2008;33:237-47.
25. Karnchanaphanurach, P.; Mirchev, R.; Ghiran, I.; **Asara, J.M.**; Papahadjopoulos-Sternberg, B.; Nicholson-Weller, A.; Golan, D.E. Membrane skeleton-linked protein complex induced by C3b deposition on human erythrocytes. *J. Clin. Invest.*, 2009;119:788-801.
26. Schweitzer, M.H.; Zheng, W.; Organ, C.L.; Avci, R.; Suo, Z.; Freemark, L.M.; Lebleu, V.S.; Duncan II, M.B.; Vander Heiden, M.G.; Neveu, J.M.; Lane, W.S.; Cottrell, J.S.; Horner, J.R.; Cantley, L.C.; Kalluri, R.; **Asara, J.M.** Biomolecular Characterization and Protein Sequences of the Campanian Hadrosaur *Brachylophosaurus canadensis*. *Science*, 2009;324:626-31.
27. Hutti, J.E.; Shen, R.R.; Abbott, D.W.; Zhou, A.Y.; Sprott, K.M.; **Asara, J.M.**; Hahn, W.C.; Cantley, L.C. Phosphorylation of the tumor suppressor CYLD by the breast cancer oncogene IKK epsilon promotes cell transformation. *Mol. Cell*, 2009;14:461-72.

28. Dibble, C.C.; **Asara, J.M.**; Manning, B.D. Characterization of Rictor phosphorylation sites reveals direct regulation of mTOR complex 2 by S6K1. *Mol. Cell. Biol.*, 2009;29:5657-70.
29. Chen, Y.J.; Dominguez-Brauer, C.; Wang, Z.; **Asara, J.M.**; Costa, R.H.; Tyner, A.L.; Lau, L.F.; Raychaudhuri, P. A conserved phosphorylation site within the forkhead domain of FoxM1B is required for its activation by cyclin-CDK1. *J. Biol. Chem.* 2009;284:30695-707.
30. Yang, X.; Friedman, A.; Nagpal, S.; Perrimon, N.; **Asara, J.M.** Use of a label-free quantitative platform based on MS/MS average TIC to calculate dynamics of protein complexes in insulin signaling. *J. Biomol. Tech.* 2009;20:272-7.
31. Palka-Hamblin, H.L.; Gierut, J.J.; Bie, W.; Brauer, P.M.; Zheng, Y.; **Asara, J.M.**; Tyner, A.L. Identification of beta-catenin as a target of the intracellular tyrosine kinase PTK6. *J. Cell Sci.* 2010;123(Pt 2):236-45.
32. Li, M.; Aliotta, J.M.; **Asara, J.M.**; Wu, Q.; Dooner, M.S.; Tucker, L.D.; Wells, A.; Quesenberry, P.J.; Ramratnam, B. Intercellular transfer of proteins as identified by stable isotope labeling of amino acids in cell culture (SILAC). *J. Biol. Chem.* 2009:[Epub ahead of print].
33. Kesavan, K.; Ratliff, J.; Johnson, E.W.; Dahlberg, W.; **Asara, J.M.**; Misra, P.; Frangioni, J.V.; Jacoby, D.B. Annexin A2 Is a Molecular Target for TM601, a Peptide with Tumor-targeting and Anti-angiogenic Effects. *J. Biol. Chem.* 2010;285:4366-74.
34. Li M, Aliotta JM, **Asara JM**, Wu Q, Dooner MS, Tucker LD, Wells A, Quesenberry PJ, Ramratnam B. Intercellular transfer of proteins as identified by stable isotope labeling of amino acids in cell culture. *J. Biol. Chem.* 2010;285:6285-97.
35. Palka-Hamblin HL, Gierut JJ, Bie W, Brauer PM, Zheng Y, **Asara JM**, Tyner AL. Identification of beta-catenin as a target of the intracellular tyrosine kinase PTK6. *J. Cell Sci.* 2010;123(Pt 2):236-45.
36. Gwinn DM, **Asara JM**, Shaw RJ. Raptor is phosphorylated by cdc2 during mitosis. *PLoS One.* 2010;5:e9197.
37. Jiang X, Chen S, **Asara JM**, Balk SP. Phosphoinositide 3-kinase pathway activation in phosphate and tensin homolog (PTEN)-deficient prostate cancer cells is independent of receptor tyrosine kinases and mediated by the p110beta and p110delta catalytic subunits. *J. Biol. Chem.* 2010;285:14980-9.
38. Nhek S, Ngo M, Yang X, Ng MM, Field SJ, **Asara JM**, Ridgway ND, Toker A. Regulation of oxysterol-binding protein golgi localization through protein kinase D-mediated phosphorylation. *Mol. Biol. Cell.* 2010;21:2327-37.
39. Zheng Y, Peng M, Wang Z, **Asara JM**, Tyner AL. Protein tyrosine kinase 6 directly phosphorylates AKT and promotes AKT activation in response to epidermal growth factor. *Mol. Cell Biol.* 2010, 30:4280-92.
40. Vander Heiden, MG; Locasale, JW; Swanson, KD; Sharfi, H; Heffron, GJ; Amador-Noguez, D; Christofk, HR; Wagner, G; Rabinowitz, JD; Asara, JM; Cantley, LC. Evidence for an alternative glycolytic pathway in rapidly proliferating cells. *Science.* 2010, 329:1492-9.

41. Tigno-Aranjuez JT, **Asara JM**, Abbott DW. Inhibition of RIP2's tyrosine kinase activity limits NOD2-driven cytokine responses. *Genes Dev.* 2010, 24:2666-77.
42. Simabuco FM, **Asara JM**, Guerrero MC, Libermann TA, Zerbini LF, Ventura AM. Structural analysis of human respiratory syncytial virus p protein: identification of intrinsically disordered domains. *Braz J Microbiol.* 2011 Jan;42(1):340-5.
43. Egan DF, Shackelford DB, Mihaylova MM, Gelino S, Kohnz RA, Mair W, Vasquez DS, Joshi A, Gwinn DM, Taylor R, **Asara JM**, Fitzpatrick J, Dillin A, Viollet B, Kundu M, Hansen M, Shaw RJ. Phosphorylation of ULK1 (hATG1) by AMP-activated protein kinase connects energy sensing to mitophagy. *Science.* 2011 Jan 28;331(6016):456-61.
44. Aboulaich N, Chui PC, **Asara JM**, Flier JS, Maratos-Flier E. Polymerase I and transcript release factor regulates lipolysis via a phosphorylation-dependent mechanism. *Diabetes.* 2011 Mar;60(3):757-65
45. Sasaki AT, Carracedo A, Locasale JW, Anastasiou D, Takeuchi K, Kahoud ER, Haviv S, **Asara JM**, Pandolfi PP, Cantley LC. Ubiquitination of K-Ras enhances activation and facilitates binding to select downstream effectors. *Sci Signal.* 2011 Mar 8;4(163):ra13
46. Tun-Kyi A, Finn G, Greenwood A, Nowak M, Lee TH, **Asara JM**, Tsokos GC, Fitzgerald K, Israel E, Li X, Exley M, Nicholson LK, Lu KP. Essential role for the prolyl isomerase Pin1 in Toll-like receptor signaling and type I interferon-mediated immunity. *Nat Immunol.* 2011 Jul 10;12(8):733-41.
47. Christofk HR, Wu N, Cantley LC, **Asara JM**. Proteomic screening method for phosphopeptide motif binding proteins using peptide libraries. *J Proteome Res.* 2011 Sep 2;10(9):4158-64.
48. Yang X, Turke AB, Qi J, Song Y, Rexer BN, Miller TW, Jänne PA, Arteaga CL, Cantley LC, Engelman JA, **Asara JM**. Using tandem mass spectrometry in targeted mode to identify activators of class IA PI3K in cancer. *Cancer Res.* 2011 Sep 15;71(18):5965-75.
49. Locasale JW, Grassian AR, Melman T, Lyssiotis CA, Mattaini KR, Bass AJ, Heffron G, Metallo CM, Muranen T, Sharfi H, Sasaki AT, Anastasiou D, Mullarky E, Vokes NI, Sasaki M, Beroukhim R, Stephanopoulos G, Ligon AH, Meyerson M, Richardson AL, Chin L, Wagner G, **Asara JM**, Brugge JS, Cantley LC, Vander Heiden MG. Phosphoglycerate dehydrogenase diverts glycolytic flux and contributes to oncogenesis. *Nat Genet.* 2011 Jul 31;43(9):869-74.
50. Lee JY, Chiu YH, Asara J, Cantley LC. Inhibition of PI3K binding to activators by serine phosphorylation of PI3K regulatory subunit p85alpha Src homology-2 domains. *Proc Natl Acad Sci U S A.* 2011 Aug 23;108(34):14157-62.
51. Yuan S, Yu X, **Asara JM**, Heuser JE, Ludtke SJ, Akey CW. The holo-apoptosome: activation of procaspase-9 and interactions with caspase-3. *Structure.* 2011 Aug 10;19(8):1084-96.
52. Yi CH, Pan H, Seebacher J, Jang IH, Hyberts SG, Heffron GJ, Vander Heiden MG, Yang R, Li F, Locasale JW, Sharfi H, Zhai B, Rodriguez-Mias R, Luithardt H, Cantley LC, Daley GQ, **Asara JM**, Gygi SP, Wagner G, Liu CF, Yuan J. Metabolic regulation of protein N-alpha-acetylation by Bcl-xL promotes cell survival. *Cell.* 2011 Aug 19;146(4):607-20.

53. Kelly AD, Breitkopf SB, Yuan M, Goldsmith J, Spentzos D, **Asara JM**. Metabolomic profiling from formalin-fixed, paraffin-embedded tumor tissue using targeted LC/MS/MS: application in sarcoma. *PLoS One*. 2011;6(10):e25357
54. Gao D, Inuzuka H, Tan MK, Fukushima H, Locasale JW, Liu P, Wan L, Zhai B, Chin YR, Shaik S, Lyssiotis CA, Gygi SP, Toker A, Cantley LC, **Asara JM**, Harper JW, Wei W. mTOR drives its own activation via SCF(β TrCP)-dependent degradation of the mTOR inhibitor DEPTOR. *Mol Cell*. 2011 Oct 21;44(2):290-303.
55. Friedman AA, Tucker G, Singh R, Yan D, Vinayagam A, Hu Y, Binari R, Hong P, Sun X, Porto M, Pacifico S, Murali T, Finley RL Jr, **Asara JM**, Berger B, Perrimon N. Proteomic and functional genomic landscape of receptor tyrosine kinase and ras to extracellular signal-regulated kinase signaling. *Sci Signal*. 2011 Oct 25;4(196):rs10.
56. Anastasiou D, Poulogiannis G, **Asara JM**, Boxer MB, Jiang JK, Shen M, Bellinger G, Sasaki AT, Locasale JW, Auld DS, Thomas CJ, Vander Heiden MG, Cantley LC. Inhibition of pyruvate kinase M2 by reactive oxygen species contributes to cellular antioxidant responses. *Science*. 2011 Dec 2;334(6060):1278-83.
57. Zheng Y, **Asara JM**, Tyner AL. Protein-tyrosine kinase 6 promotes peripheral adhesion complex formation and cell migration by phosphorylating p130 CRK-associated substrate. *J Biol Chem*. 2012 Jan 2;287(1):148-58.
58. Libert S, Pointer K, Bell EL, Das A, Cohen DE, **Asara JM**, Kapur K, Bergmann S, Preisig M, Otowa T, Kendler KS, Chen X, Hetteima JM, van den Oord EJ, Rubio JP, Guarente L. SIRT1 activates MAO-A in the brain to mediate anxiety and exploratory drive. *Cell*. 2011 Dec 23;147(7):1459-72.
59. Lu B, **Asara JM**, Sanda MG, Arredouani MS. The role of the transcription factor SIM2 in prostate cancer. *PLoS One*. 2011;6(12):e28837.
60. Locasale JW, Melman T, Song S, Yang X, Swanson KD, Cantley LC, Wong ET, **Asara JM**. Metabolomics of human cerebrospinal fluid identifies signatures of malignant glioma. *Mol Cell Proteomics*. 2012 Jun;11(6):M111.014688.
61. Kategaya LS, Hilliard A, Zhang L, **Asara JM**, Ptáček LJ, Fu YH. Casein kinase 1 proteomics reveal prohibitin 2 function in molecular clock. *PLoS One*. 2012;7(2):e31987.
62. Breitkopf SB, **Asara JM**. Determining in vivo phosphorylation sites using mass spectrometry. *Curr Protoc Mol Biol*. 2012 Apr;Chapter 18:Unit18.19.1-27.
63. Yuan M, Breitkopf SB, Yang X, **Asara JM**. A positive/negative ion-switching, targeted mass spectrometry-based metabolomics platform for bodily fluids, cells, and fresh and fixed tissue. *Nat Protoc*. 2012 Apr 12;7(5):872-81.
64. Ying H, Kimmelman AC, Lyssiotis CA, Hua S, Chu GC, Fletcher-Sananikone E, Locasale JW, Son J, Zhang H, Coloff JL, Yan H, Wang W, Chen S, Viale A, Zheng H, Paik JH, Lim C, Guimaraes AR, Martin ES, Chang J, Hezel AF, Perry SR, Hu J, Gan B, Xiao Y, **Asara JM**, Weissleder R, Wang YA, Chin L, Cantley LC, DePinho RA. Oncogenic Kras maintains pancreatic tumors through regulation of anabolic glucose metabolism. *Cell*. 2012 Apr 27;149(3):656-70.

65. Turke AB, Song Y, Costa C, Cook R, Arteaga CL, **Asara JM**, Engelman JA. MEK inhibition leads to PI3K/AKT activation by relieving a negative feedback on ERBB receptors. *Cancer Res.* 2012 Jul 1;72(13):3228-37.
66. Brown JR, Hanna M, Tesar B, Werner L, Pochet N, **Asara JM**, Wang YE, Dal Cin P, Fernandes SM, Thompson C, Macconail L, Wu CJ, Van de Peer Y, Correll M, Regev A, Neuberg D, Freedman AS. Integrative genomic analysis implicates gain of PIK3CA at 3q26 and MYC at 8q24 in chronic lymphocytic leukemia. *Clin Cancer Res.* 2012 Jul 15;18(14):3791-802.
67. Fukushima H, Matsumoto A, Inuzuka H, Zhai B, Lau AW, Wan L, Gao D, Shaik S, Yuan M, Gygi SP, Jimi E, **Asara JM**, Nakayama K, Nakayama KI, Wei W. SCF(Fbw7) modulates the NFkB signaling pathway by targeting NFkB2 for ubiquitination and destruction. *Cell Rep.* 2012 May 31;1(5):434-43.
68. Dibble CC, Elis W, Menon S, Qin W, Klekota J, **Asara JM**, Finan PM, Kwiatkowski DJ, Murphy LO, Manning BD. TBC1D7 is a third subunit of the TSC1-TSC2 complex upstream of mTORC1. *Mol Cell.* 2012 Aug 24;47(4):535-46. doi: 10.1016/j.molcel.2012.06.009.
69. Li M, Aliotta JM, **Asara JM**, Tucker L, Quesenberry P, Lally M, Ramratnam B. Quantitative proteomic analysis of exosomes from HIV-1-infected lymphocytic cells. *Proteomics.* 2012 Jul;12(13):2203-11.
70. Juvekar A, Burga LN, Hu H, Lunsford EP, Ibrahim YH, Balmaña J, Rajendran A, Papa A, Spencer K, Lyssiotis CA, Nardella C, Pandolfi PP, Baselga J, Scully R, **Asara JM**, Cantley LC, Wulf GM. Combining a PI3K inhibitor with a PARP inhibitor provides an effective therapy for BRCA1-related breast cancer. *Cancer Discov.* 2012 Nov;2(11):1048-63.
71. Anastasiou D, Yu Y, Israelsen WJ, Jiang JK, Boxer MB, Hong BS, Tempel W, Dimov S, Shen M, Jha A, Yang H, Mattaini KR, Metallo CM, Fiske BP, Courtney KD, Malstrom S, Khan TM, Kung C, Skoumbourdis AP, Veith H, Southall N, Walsh MJ, Brimacombe KR, Leister W, Lunt SY, Johnson ZR, Yen KE, Kunii K, Davidson SM, Christofk HR, Austin CP, Inglese J, Harris MH, **Asara JM**, Stephanopoulos G, Salituro FG, Jin S, Dang L, Auld DS, Park HW, Cantley LC, Thomas CJ, Vander Heiden MG. Pyruvate kinase M2 activators promote tetramer formation and suppress tumorigenesis. *Nat Chem Biol.* 2012 Oct;8(10):839-47.
72. Mack HI, Zheng B, **Asara JM**, Thomas SM. AMPK-dependent phosphorylation of ULK1 regulates ATG9 localization. *Autophagy.* 2012 Aug;8(8):1197-214.
73. Breitkopf SB, Yuan M, Pihan GA, **Asara JM**. Detection of a rare BCR-ABL tyrosine kinase fusion protein in H929 multiple myeloma cells using immunoprecipitation (IP)-tandem mass spectrometry (MS/MS). *Proc Natl Acad Sci U S A.* 2012 Oct 2;109(40):16190-5. doi: 10.1073/pnas.1212759109.
74. Zheng Y, Gierut J, Wang Z, Miao J, **Asara JM**, Tyner AL. Protein tyrosine kinase 6 protects cells from anoikis by directly phosphorylating focal adhesion kinase and activating AKT. *Oncogene.* 2013 Sep 5;32(36):4304-12.
75. Shyh-Chang N, Locasale JW, Lyssiotis CA, Zheng Y, Teo RY, Ratanasirintra-woot S, Zhang J, Onder T, Unternaehrer JJ, Zhu H, **Asara JM**, Daley GQ, Cantley LC. Influence of threonine metabolism on S-adenosylmethionine and histone methylation. *Science.* 2013 Jan 11;339(6116):222-6.

76. Webhofer C, Gormanns P, Reckow S, Lebar M, Maccarrone G, Ludwig T, Pütz B, **Asara JM**, Holsboer F, Sillaber I, Zieglgänsberger W, Turck CW. Proteomic and metabolomic profiling reveals time-dependent changes in hippocampal metabolism upon paroxetine treatment and biomarker candidates. *J Psychiatr Res*. 2013 Mar;47(3):289-98.
77. Nicolay BN, Gameiro PA, Tschöp K, Korenjak M, Heilmann AM, **Asara JM**, Stephanopoulos G, Iliopoulos O, Dyson NJ. Loss of RBF1 changes glutamine catabolism. *Genes Dev*. 2013 Jan 15;27(2):182-96.
78. Tanos BE, Yang HJ, Soni R, Wang WJ, Macaluso FP, **Asara JM**, Tsou MF. Centriole distal appendages promote membrane docking, leading to cilia initiation. *Genes Dev*. 2013 Jan 15;27(2):163-8.
79. Ben-Sahra I, Howell JJ, **Asara JM**, Manning BD. Stimulation of de novo pyrimidine synthesis by growth signaling through mTOR and S6K1. *Science*. 2013 Mar 15;339(6125):1323-8.
80. Wu N, Zheng B, Shaywitz A, Dagon Y, Tower C, Bellinger G, Shen CH, Wen J, Asara J, McGraw TE, Kahn BB, Cantley LC. AMPK-dependent degradation of TXNIP upon energy stress leads to enhanced glucose uptake via GLUT1. *Mol Cell*. 2013 Mar 28;49(6):1167-75.
81. Son J, Lyssiotis CA, Ying H, Wang X, Hua S, Ligorio M, Perera RM, Ferrone CR, Mullarky E, Shyh-Chang N, Kang Y, Fleming JB, Bardeesy N, **Asara JM**, Haigis MC, DePinho RA, Cantley LC, Kimmelman AC. Glutamine supports pancreatic cancer growth through a KRAS-regulated metabolic pathway. *Nature*. 2013 Apr 4;496(7443):101-5. Erratum in: *Nature*. 2013 Jul 25;499(7459):504.
82. Parent KN, Takagi Y, Cardone G, Olson NH, Ericsson M, Yang M, Lee Y, **Asara JM**, Fichorova RN, Baker TS, Nibert ML. Structure of a protozoan virus from the human genitourinary parasite *Trichomonas vaginalis*. *MBio*. 2013 Apr 2;4(2).
83. Riedel CG, Downen RH, Lourenco GF, Kirienko NV, Heimbucher T, West JA, Bowman SK, Kingston RE, Dillin A, **Asara JM**, Ruvkun G. DAF-16 employs the chromatin remodeller SWI/SNF to promote stress resistance and longevity. *Nat Cell Biol*. 2013 May;15(5):491-501.
84. Wang WJ, Tay HG, Soni R, Perumal GS, Goll MG, Macaluso FP, **Asara JM**, Amack JD, Tsou MF. CEP162 is an axoneme-recognition protein promoting ciliary transition zone assembly at the cilia base. *Nat Cell Biol*. 2013 Jun;15(6):591-601.
85. Shinoda G, Shyh-Chang N, Soysa TY, Zhu H, Seligson MT, Shah SP, Abo-Sido N, Yabuuchi A, Hagan JP, Gregory RI, **Asara JM**, Cantley LC, Moss EG, Daley GQ. Fetal deficiency of *lin28* programs life-long aberrations in growth and glucose metabolism. *Stem Cells*. 2013 Aug;31(8):1563-73.
86. Liu Y, Marks K, Cowley GS, Carretero J, Liu Q, Nieland TJ, Xu C, Cohoon TJ, Gao P, Zhang Y, Chen Z, Altabef AB, Tchaicha JH, Wang X, Choe S, Driggers EM, Zhang J, Bailey ST, Sharpless NE, Hayes DN, Patel NM, Janne PA, Bardeesy N, Engelman JA, Manning BD, Shaw RJ, **Asara JM**, Scully R, Kimmelman A, Byers LA, Gibbons DL, Wistuba II, Heymach JV, Kwiatkowski DJ, Kim WY, Kung AL, Gray NS, Root DE, Cantley LC, Wong KK. Metabolic and functional genomic studies identify deoxythymidylate kinase as a target in LKB1-mutant lung cancer. *Cancer Discov*. 2013 Aug;3(8):870-9.

87. Chen S, Jiang X, Gewinner CA, **Asara JM**, Simon NI, Cai C, Cantley LC, Balk SP. Tyrosine kinase BMX phosphorylates phosphotyrosine-primed motif mediating the activation of multiple receptor tyrosine kinases. *Sci Signal*. 2013 May 28;6(277):ra40.
88. Yeo H, Lyssiotis CA, Zhang Y, Ying H, **Asara JM**, Cantley LC, Paik JH. FoxO3 coordinates metabolic pathways to maintain redox balance in neural stem cells. *EMBO J*. 2013 Oct 2;32(19):2589-602. Reschke M, Clohessy JG, Seitzer N, Goldstein DP, Breitkopf SB, Schmolze DB, Ala U, **Asara JM**, Beck AH, Pandolfi PP. Characterization and analysis of the composition and dynamics of the mammalian riboproteome. *Cell Rep*. 2013 Sep 26;4(6):1276-87.
89. Shen CH, Yuan P, Perez-Lorenzo R, Zhang Y, Lee SX, Ou Y, **Asara JM**, Cantley LC, Zheng B. Phosphorylation of BRAF by AMPK impairs BRAF-KSR1 association and cell proliferation. *Mol Cell*. 2013 Oct 24;52(2):161-72.
90. Liu P, Gan W, Inuzuka H, Lazorchak AS, Gao D, Arojo O, Liu D, Wan L, Zhai B, Yu Y, Yuan M, Kim BM, Shaik S, Menon S, Gygi SP, Lee TH, **Asara JM**, Manning BD, Blenis J, Su B, Wei W. Sin1 phosphorylation impairs mTORC2 complex integrity and inhibits downstream Akt signalling to suppress tumorigenesis. *Nat Cell Biol*. 2013 Nov;15(11):1340-50.
91. Shyh-Chang N, Zhu H, Yvanka de Soysa T, Shinoda G, Seligson MT, Tsanov KM, Nguyen L, **Asara JM**, Cantley LC, Daley GQ. Lin28 enhances tissue repair by reprogramming cellular metabolism. *Cell*. 2013 Nov 7;155(4):778-92.
92. Emerling BM, Hurov JB, Poulogiannis G, Tsukazawa KS, Choo-Wing R, Wulf GM, Bell EL, Shim HS, Lamia KA, Rameh LE, Bellinger G, Sasaki AT, **Asara JM**, Yuan X, Bullock A, Denicola GM, Song J, Brown V, Signoretti S, Cantley LC. Depletion of a putatively druggable class of phosphatidylinositol kinases inhibits growth of p53-null tumors. *Cell*. 2013 Nov 7;155(4):844-57.
93. Parkhitko AA, Priolo C, Coloff JL, Yun J, Wu JJ, Mizumura K, Xu W, Malinowska IA, Yu J, Kwiatkowski DJ, Locasale JW, **Asara JM**, Choi AM, Finkel T, Henske EP. Autophagy-Dependent Metabolic Reprogramming Sensitizes TSC2-Deficient Cells to the Antimetabolite 6-Aminonicotinamide. *Mol Cancer Res*. 2014 Jan;12(1):48-57.
94. Ding J, Li T, Wang X, Zhao E, Choi JH, Yang L, Zha Y, Dong Z, Huang S, **Asara JM**, Cui H, Ding HF. The Histone H3 Methyltransferase G9A Epigenetically Activates the Serine-Glycine Synthesis Pathway to Sustain Cancer Cell Survival and Proliferation. *Cell Metab*. 2013 Dec 3;18(6):896-907.
95. Sumita K, Yoshino H, Sasaki M, Majd N, Kahoud ER, Takahashi H, Takeuchi K, Kuroda T, Lee S, Charest PG, Takeda K, **Asara JM**, Firtel RA, Anastasiou D, Sasaki AT. Degradation of Activated K-Ras Orthologue via K-Ras Specific Lysine Residues is Required for Cytokinesis. *J Biol Chem*. 2013 Dec 18. [Epub ahead of print]
96. Gilpin SE, Guyette JP, Gonzalez G, Ren X, **Asara JM**, Mathisen DJ, Vacanti JP, Ott HC. Perfusion decellularization of human and porcine lungs: Bringing the matrix to clinical scale. *J Heart Lung Transplant*. 2013 Oct 26. pii: S1053-2498(13)01511-8.
97. Lall R, Ganapathy S, Yang M, Xiao S, Xu T, Su H, Shadfan M, **Asara JM**, Ha CS, Ben-Sahra I, Manning BD, Little JB, Yuan ZM. Low-dose radiation exposure induces a HIF-1-mediated

- adaptive and protective metabolic response. *Cell Death Differ.* 2014 May;21(5):836-44. doi: 10.1038/cdd.2014.24.
98. Akbay EA, Moslehi J, Christensen CL, Saha S, Tchaicha JH, Ramkissoon SH, Stewart KM, Carretero J, Kikuchi E, Zhang H, Cohoon TJ, Murray S, Liu W, Uno K, Fisch S, Jones K, Gurumurthy S, Gliser C, Choe S, Keenan M, Son J, Stanley I, Losman JA, Padera R, Bronson RT, **Asara JM**, Abdel-Wahab O, Amrein PC, Fathi AT, Danial NN, Kimmelman AC, Kung AL, Ligon KL, Yen KE, Kaelin WG Jr, Bardeesy N, Wong KK. D-2-hydroxyglutarate produced by mutant IDH2 causes cardiomyopathy and neurodegeneration in mice. *Genes Dev.* 2014 Mar 1;28(5):479-90. doi: 10.1101/gad.231233.113.
99. Liu P, Begley M, Michowski W, Inuzuka H, Ginzberg M, Gao D, Tsou P, Gan W, Papa A, Kim BM, Wan L, Singh A, Zhai B, Yuan M, Wang Z, Gygi SP, Lee TH, Lu KP, Toker A, Pandolfi PP, **Asara JM**, Kirschner MW, Sicinski P, Cantley L, Wei W. Cell-cycle-regulated activation of Akt kinase by phosphorylation at its carboxyl terminus. *Nature.* 2014 Apr 24;508(7497):541-5. doi: 10.1038/nature13079.
100. Karamichos D, Hutcheon AE, Rich CB, Trinkaus-Randall V, **Asara JM**, Zieske JD. In vitro model suggests oxidative stress involved in keratoconus disease. *Sci Rep.* 2014 Apr 9;4:4608. doi: 10.1038/srep04608.
101. Kraus D, Yang Q, Kong D, Banks AS, Zhang L, Rodgers JT, Pinen E, Pulnilkunnil TC, Gong F, Wang YC, Cen Y, Sauve AA, **Asara JM**, Peroni OD, Monia BP, Bhanot S, Alhonen L, Puigserver P, Kahn BB. Nicotinamide N-methyltransferase knockdown protects against diet-induced obesity. *Nature.* 2014 Apr 10;508(7495):258-62. doi: 10.1038/nature13198.
102. González-Billalabeitia E, Seitzer N, Song SJ, Song MS, Patnaik A, Liu XS, Epping MT, Papa A, Hobbs RM, Chen M, Lunardi A, Ng C, Webster KA, Signoretti S, Loda M, **Asara JM**, Nardella C, Clohessy JG, Cantley LC, Pandolfi PP. Vulnerabilities of PTEN-TP53-Deficient Prostate Cancers to Compound PARP-PI3K Inhibition. *Cancer Discov.* 2014 Aug;4(8):896-904. doi:10.1158/2159-8290.CD-13-0230.
103. Janzer A, German NJ, Gonzalez-Herrera KN, **Asara JM**, Haigis MC, Struhl K. Metformin and phenformin deplete tricarboxylic acid cycle and glycolytic intermediates during cell transformation and NTPs in cancer stem cells. *Proc Natl Acad Sci U S A.* 2014 Jul 22;111(29):10574-9. doi: 10.1073/pnas.1409844111.
104. Viale A, Pettazzoni P, Lyssiotis CA, Ying H, Sánchez N, Marchesini M, Carugo A, Green T, Seth S, Giuliani V, Kost-Alimova M, Muller F, Colla S, Nezi L, Genovese G, Deem AK, Kapoor A, Yao W, Brunetto E, Kang Y, Yuan M, **Asara JM**, Wang YA, Heffernan TP, Kimmelman AC, Wang H, Fleming JB, Cantley LC, DePinho RA, Draetta GF. Oncogene ablation-resistant pancreatic cancer cells depend on mitochondrial function. *Nature.* 2014 Aug 10. doi: 10.1038/nature13611. [Epub ahead of print].
105. Filiou MD, **Asara JM**, Nussbaumer M, Teplytska L, Landgraf R, Turck CW. Behavioral extremes of trait anxiety in mice are characterized by distinct metabolic profiles. *J Psychiatr Res.* 2014 Jul 30. pii: S0022-3956(14)00216-7. doi: 10.1016/j.jpsychires.2014.07.019. [Epub ahead of print].

106. Liu XS, Haines JE, Mehanna EK, Genet MD, Ben-Sahra I, **Asara JM**, Manning BD, Yuan ZM. ZBTB7A acts as a tumor suppressor through the transcriptional repression of glycolysis. *Genes Dev.* 2014 Sep 1;28(17):1917-28. doi: 10.1101/gad.245910.114.
107. Bordoli MR, Yum J, Breitkopf SB, Thon JN, Italiano JE Jr, Xiao J, Worby C, Wong SK, Lin G, Edenius M, Keller TL, **Asara JM**, Dixon JE, Yeo CY, Whitman M. A secreted tyrosine kinase acts in the extracellular environment. *Cell.* 2014;158(5):1033-44. doi: 10.1016/j.cell.2014.06.048.
108. Liu XS, Haines JE, Mehanna EK, Genet MD, Ben-Sahra I, **Asara JM**, Manning BD, Yuan ZM. ZBTB7A acts as a tumor suppressor through the transcriptional repression of glycolysis. *Genes Dev.* 2014 Sep 1;28(17):1917-28. doi: 10.1101/gad.245910.114.
109. Bhanot H, Reddy MM, Nonami A, Weisberg EL, Bonal D, Kirschmeier PT, Salgia S, Podar K, Galinsky I, Chowdary TK, Neuberg D, Tonon G, Stone RM, **Asara J**, Griffin JD, Sattler M. Pathological glycogenesis through glycogen synthase 1 and suppression of excessive AMP kinase activity in myeloid leukemia cells. *Leukemia.* 2015 Feb 23. doi: 10.1038/leu.2015.46.
110. LeBleu VS, O'Connell JT, Gonzalez Herrera KN, Wikman H, Pantel K, Haigis MC, de Carvalho FM, Damascena A, Domingos Chinen LT, Rocha RM, **Asara JM**, Kalluri R. PGC-1 α mediates mitochondrial biogenesis and oxidative phosphorylation in cancer cells to promote metastasis. *Nat Cell Biol.* 2014 Oct;16(10):992-1003, 1-15. doi:10.1038/ncb3039.
111. Mackey AM, Sarkes DA, Bettencourt I, **Asara JM**, Rameh LE. PIP4ky is a substrate for mTORC1 that maintains basal mTORC1 signaling during starvation. *Sci Signal.* 2014 Nov 4;7(350):ra104. doi: 10.1126/scisignal.2005191.
112. DeRan M, Yang J, Shen CH, Peters EC, Fitamant J, Chan P, Hsieh M, Zhu S, **Asara JM**, Zheng B, Bardeesy N, Liu J, Wu X. Energy stress regulates hippo-YAP signaling involving AMPK-mediated regulation of angiotensin-like 1 protein. *Cell Rep.* 2014 Oct 23;9(2):495-503. doi: 10.1016/j.celrep.2014.09.036.
113. Priyadarsini S, Hjortdal J, Sarker-Nag A, Sejersen H, **Asara JM**, Karamichos D. Gross cystic disease fluid protein-15/prolactin-inducible protein as a biomarker for keratoconus disease. *PLoS One.* 2014 Nov 18;9(11):e113310. doi:10.1371/journal.pone.0113310.
114. Karamichos D, Zieske JD, Sejersen H, Sarker-Nag A, **Asara JM**, Hjortdal J. Tear metabolite changes in keratoconus. *Exp Eye Res.* 2015 Jan 9;132C:1-8. doi: 10.1016/j.exer.2015.01.007.
115. Weckmann K, Labermaier C, **Asara JM**, Müller MB, Turck CW. Time-dependent metabolomic profiling of Ketamine drug action reveals hippocampal pathway alterations and biomarker candidates. *Transl Psychiatry.* 2014 Nov 11;4:e481. doi:10.1038/tp.2014.119.
116. Medvetz D, Sun Y, Li C, Khabibullin D, Balan M, Parkhitko A, Priolo C, **Asara JM**, Pal S, Yu J, Henske EP. High-throughput drug screen identifies chelerythrine as a selective inducer of death in a TSC2-null setting. *Mol Cancer Res.* 2015 Jan;13(1):50-62. doi: 10.1158/1541-7786.MCR-14-0440.
117. Liu P, Gan W, Guo C, Xie A, Gao D, Guo J, Zhang J, Willis N, Su A, **Asara JM**, Scully R, Wei W. Akt-Mediated Phosphorylation of XLF Impairs Non-Homologous End-Joining DNA Repair. *Mol Cell.* 2015 Feb 19;57(4):648-61. doi:10.1016/j.molcel.2015.01.005.

118. Bhanot H, Reddy MM, Nonami A, Weisberg EL, Bonal D, Kirschmeier PT, Salgia S, Podar K, Galinsky I, Chowdary TK, Neuberger D, Tonon G, Stone RM, **Asara J**, Griffin JD, Sattler M. Pathological glycogenesis through glycogen synthase 1 and suppression of excessive AMP kinase activity in myeloid leukemia cells. *Leukemia*. 2015 Jul;29(7):1555-63. doi: 10.1038/leu.2015.46. Epub 2015 Feb 23.
119. McKay TB, Lyon D, Sarker-Nag A, Priyadarsini S, **Asara JM**, Karamichos D. Quercetin attenuates lactate production and extracellular matrix secretion in keratoconus. *Sci Rep*. 2015 Mar 11;5:9003. doi: 10.1038/srep09003.
120. Maiso P, Huynh D, Moschetta M, Sacco A, Aljawai Y, Mishima Y, **Asara JM**, Roccaro AM, Kimmelman AC, Ghobrial IM. Metabolic signature identifies novel targets for drug resistance in multiple myeloma. *Cancer Res*. 2015 May 15;75(10):2071-82. doi: 10.1158/0008-5472.CAN-14-3400. Epub 2015 Mar 13.
121. Kwon Y, Song W, Droujinine IA, Hu Y, **Asara JM**, Perrimon N. Systemic organ wasting induced by localized expression of the secreted insulin/IGF antagonist ImpL2. *Dev Cell*. 2015 Apr 6;33(1):36-46. doi: 10.1016/j.devcel.2015.02.012.
122. Lipton JO, Yuan ED, Boyle LM, Ebrahimi-Fakhari D, Kwiatkowski E, Nathan A, Güttler T, Davis F, **Asara JM**, Sahin M. The Circadian Protein BMAL1 Regulates Translation in Response to S6K1-Mediated Phosphorylation. *Cell*. 2015 May 21;161(5):1138-51. doi: 10.1016/j.cell.2015.04.002. Epub 2015 May 14.
123. Shin S, Buel GR, Wolgamott L, Plas DR, **Asara JM**, Blenis J, Yoon SO. ERK2 Mediates Metabolic Stress Response to Regulate Cell Fate. *Mol Cell*. 2015 Aug 6;59(3):382-98. doi: 10.1016/j.molcel.2015.06.020. Epub 2015 Jul 16.
124. Chourasia AH, Tracy K, Frankenberger C, Boland ML, Sharifi MN, Drake LE, Sachleben JR, **Asara JM**, Locasale JW, Karczmar GS, Macleod KF. Mitophagy defects arising from BNip3 loss promote mammary tumor progression to metastasis. *EMBO Rep*. 2015 Sep;16(9):1145-63. doi: 10.15252/embr.201540759. Epub 2015 Jul 31.
125. Egan DF, Chun MG, Vamos M, Zou H, Rong J, Miller CJ, Lou HJ, Raveendra-Panickar D, Yang CC, Sheffler DJ, Teriete P, **Asara JM**, Turk BE, Cosford ND, Shaw RJ. Small Molecule Inhibition of the Autophagy Kinase ULK1 and Identification of ULK1 Substrates. *Mol Cell*. 2015 Jul 16;59(2):285-97. doi: 10.1016/j.molcel.2015.05.031. Epub 2015 Jun 25.
126. McKay TB, Sarker-Nag A, Lyon D, **Asara JM**, Karamichos D. Quercetin modulates keratoconus metabolism in vitro. *Cell Biochem Funct*. 2015 Jul;33(5):341-50. doi: 10.1002/cbf.3122. Epub 2015 Jul 14.
127. Hong S, Moreno-Navarrete JM, Wei X, Kikukawa Y, Tzamelis I, Prasad D, Lee Y, **Asara JM**, Fernandez-Real JM, Maratos-Flier E, Pissios P. Nicotinamide N-methyltransferase regulates hepatic nutrient metabolism through Sirt1 protein stabilization. *Nat Med*. 2015 Aug;21(8):887-94. doi: 10.1038/nm.3882. Epub 2015 Jul 13.
128. Gan W, Dai X, Lunardi A, Li Z, Inuzuka H, Liu P, Varmeh S, Zhang J, Cheng L, Sun Y, **Asara JM**, Beck AH, Huang J, Pandolfi PP, Wei W. SPOP Promotes Ubiquitination and Degradation of the ERG Oncoprotein to Suppress Prostate Cancer Progression. *Mol Cell*. 2015 Sep 17;59(6):917-30. doi: 10.1016/j.molcel.2015.07.026. Epub 2015 Sep 3.

129. Perl A, Hanczko R, Lai ZW, Oaks Z, Kelly R, Borsuk R, **Asara JM**, Phillips PE. Comprehensive metabolome analyses reveal N-acetylcysteine-responsive accumulation of kynurenine in systemic lupus erythematosus: implications for activation of the mechanistic target of rapamycin. *Metabolomics*. 2015;11(5):1157-1174. Epub 2015 Jan 20.
130. Zhang J, Ratanasirintrawoot S, Chandrasekaran S, Wu Z, Ficarro SB, Yu C, Ross CA, Cacchiarelli D, Xia Q, Seligson M, Shinoda G, Xie W, Cahan P, Wang L, Ng SC, Tintara S, Trapnell C, Onder T, Loh YH, Mikkelsen T, Sliz P, Teitell MA, **Asara JM**, Marto JA, Li H, Collins JJ, Daley GQ. LIN28 Regulates Stem Cell Metabolism and Conversion to Primed Pluripotency. *Cell Stem Cell*. 2016 Jun 15. pii: S1934-5909(16)30093-5. doi: 10.1016/j.stem.2016.05.009.
131. Cheema AK, **Asara JM**, Wang Y, Neubert TA, Tolstikov V, Turck CW. The ABRF Metabolomics Research Group 2013 Study: Investigation of Spiked Compound Differences in a Human Plasma Matrix. *J Biomol Tech*. 2015 Sep;26(3):83-9. doi: 10.7171/jbt.15-2603-001.
132. Kissick HT, On ST, Dunn LK, Sanda MG, **Asara JM**, Pellegrini KL, Noel JK, Arredouani MS. The transcription factor ERG increases expression of neurotransmitter receptors on prostate cancer cells. *BMC Cancer*. 2015 Aug 27;15:604. doi: 10.1186/s12885-015-1612-3.
133. Lien EC, Lyssiotis CA, Juvekar A, Hu H, **Asara JM**, Cantley LC, Toker A. Glutathione biosynthesis is a metabolic vulnerability in PI(3)K/Akt-driven breast cancer. *Nat Cell Biol*. 2016 May;18(5):572-8. doi: 10.1038/ncb3341. Epub 2016 Apr 18.
134. McKay TB, Hjortdal J, Sejersen H, **Asara JM**, Wu J, Karamichos D. Endocrine and Metabolic Pathways Linked to Keratoconus: Implications for the Role of Hormones in the Stromal Microenvironment. *Sci Rep*. 2016 May 9;6:25534. doi: 10.1038/srep25534.
135. Parkhitko AA, Binari R, Zhang N, **Asara JM**, Demontis F, Perrimon N. Tissue-specific down-regulation of S-adenosyl-homocysteine via suppression of dAhcyl1/dAhcyl2 extends health span and life span in Drosophila. *Genes Dev*. 2016 Jun 15;30(12):1409-22. doi: 10.1101/gad.282277.116. Epub 2016 Jun 16.
136. Breitkopf SB, Yuan M, Helenius KP, Lyssiotis CA, **Asara JM**. Triomics Analysis of Imatinib-Treated Myeloma Cells Connects Kinase Inhibition to RNA Processing and Decreased Lipid Biosynthesis. *Anal Chem*. 2015 Nov 3;87(21):10995-1006. doi: 10.1021/acs.analchem.5b03040. Epub 2015 Oct 12.
137. Ben-Sahra I, Hoxhaj G, Ricoult SJ, **Asara JM**, Manning BD. mTORC1 induces purine synthesis through control of the mitochondrial tetrahydrofolate cycle. *Science*. 2016 Feb 12;351(6274):728-33. doi: 10.1126/science.aad0489.
138. Tan JL, Fogley RD, Flynn RA, Ablain J, Yang S, Saint-André V, Fan ZP, Do BT, Laga AC, Fujinaga K, Santoriello C, Greer CB, Kim YJ, Clohessy JG, Bothmer A, Pandell N, Avagyan S, Brogie JE, van Rooijen E, Hagedorn EJ, Shyh-Chang N, White RM, Price DH, Pandolfi PP, Peterlin BM, Zhou Y, Kim TH, **Asara JM**, Chang HY, Young RA, Zon LI. Stress from Nucleotide Depletion Activates the Transcriptional Regulator HEXIM1 to Suppress Melanoma. *Mol Cell*. 2016 Apr 7;62(1):34-46. doi: 10.1016/j.molcel.2016.03.013.
139. Su SY, Hogrefe-Phi CE, **Asara JM**, Turck CW, Golub MS. Peripheral fibroblast metabolic pathway alterations in juvenile rhesus monkeys undergoing long-term fluoxetine administration.

- Eur Neuropsychopharmacol.* 2016 Jul;26(7):1110-8. doi: 10.1016/j.euroneuro.2016.03.017. Epub 2016 Apr 12.
140. Hu H, Juvekar A, Lyssiotis CA, Lien EC, Albeck JG, Oh D, Varma G, Hung YP, Ullas S, Lauring J, Seth P, Lundquist MR, Tolan DR, Grant AK, Needleman DJ, **Asara JM**, Cantley LC, Wulf GM. Phosphoinositide 3-Kinase Regulates Glycolysis through Mobilization of Aldolase from the Actin Cytoskeleton. *Cell.* 2016 Jan 28;164(3):433-46. doi: 10.1016/j.cell.2015.12.042.
141. Sumita K, Lo YH, Takeuchi K, Senda M, Kofuji S, Ikeda Y, Terakawa J, Sasaki M, Yoshino H, Majd N, Zheng Y, Kahoud ER, Yokota T, Emerling BM, **Asara JM**, Ishida T, Locasale JW, Daikoku T, Anastasiou D, Senda T, Sasaki AT. The Lipid Kinase PI5P4K β Is an Intracellular GTP Sensor for Metabolism and Tumorigenesis. *Mol Cell.* 2016 Jan 21;61(2):187-98. doi: 10.1016/j.molcel.2015.12.011. Epub 2016 Jan 7.
142. Breitkopf SB, Yang X, Begley MJ, Kulkarni M, Chiu YH, Turke AB, Lauriol J, Yuan M, Qi J, Engelman JA, Hong P, Kontaridis MI, Cantley LC, Perrimon N, **Asara JM**. A Cross-Species Study of PI3K Protein-Protein Interactions Reveals the Direct Interaction of P85 and SHP2. *Sci Rep.* 2016 Feb 3;6:20471. doi: 10.1038/srep20471.
143. Mullarky E, Lucki NC, Beheshti Zavareh R, Anglin JL, Gomes AP, Nicolay BN, Wong JC, Christen S, Takahashi H, Singh PK, Blenis J, Warren JD, Fendt SM, **Asara JM**, DeNicola GM, Lyssiotis CA, Lairson LL, Cantley LC. Identification of a small molecule inhibitor of 3-phosphoglycerate dehydrogenase to target serine biosynthesis in cancers. *Proc Natl Acad Sci U S A.* 2016 Feb 16;113(7):1778-83. doi: 10.1073/pnas.1521548113. Epub 2016 Feb 1.
144. Sadanandam A, Wullschleger S, Lyssiotis CA, Grötzinger C, Barbi S, Bersani S, Körner J, Wafy I, Mafficini A, Lawlor RT, Simbolo M, **Asara JM**, Bläker H, Cantley LC, Wiedenmann B, Scarpa A, Hanahan D. A Cross-Species Analysis in Pancreatic Neuroendocrine Tumors Reveals Molecular Subtypes with Distinctive Clinical, Metastatic, Developmental, and Metabolic Characteristics. *Cancer Discov.* 2015 Dec;5(12):1296-313. doi: 10.1158/2159-8290.CD-15-0068. Epub 2015 Oct 7.
145. Yun J, Mullarky E, Lu C, Bosch KN, Kavalier A, Rivera K, Roper J, Chio II, Giannopoulou EG, Rago C, Muley A, **Asara JM**, Paik J, Elemento O, Chen Z, Pappin DJ, Dow LE, Papadopoulos N, Gross SS, Cantley LC. Vitamin C selectively kills KRAS and BRAF mutant colorectal cancer cells by targeting GAPDH. *Science.* 2015 Dec 11;350(6266):1391-6. doi: 10.1126/science.aaa5004. Epub 2015 Nov 5.
146. Begley MJ, Yun CH, Gewinner CA, **Asara JM**, Johnson JL, Coyle AJ, Eck MJ, Apostolou I, Cantley LC. EGF-receptor specificity for phosphotyrosine-primed substrates provides signal integration with Src. *Nat Struct Mol Biol.* 2015 Dec;22(12):983-90. doi: 10.1038/nsmb.3117. Epub 2015 Nov 9.
147. Nussbaumer M, **Asara JM**, Teplytska L, Murphy MP, Logan A, Turck CW, Filiou MD. Selective Mitochondrial Targeting Exerts Anxiolytic Effects In Vivo. *Neuropsychopharmacology.* 2016 Jun;41(7):1751-8. doi: 10.1038/npp.2015.341. Epub 2015 Nov 16.
148. Barrows D, Schoenfeld SM, Hodakoski C, Silkov A, Honig B, Couvillon A, Shymanets A, Nürnberg B, **Asara JM**, Parsons R. p21-activated Kinases (PAKs) Mediate the Phosphorylation of

- PREX2 Protein to Initiate Feedback Inhibition of Rac1 GTPase. *J Biol Chem.* 2015 Nov 27;290(48):28915-31. doi: 10.1074/jbc.M115.668244. Epub 2015 Oct 5.
149. Ricoult SJ, Dibble CC, **Asara JM**, Manning BD. SREBP regulates the expression and metabolic functions of wild-type and oncogenic IDH1. *Mol Cell Biol.* 2016 Jun 27. pii: MCB.00163-16.
150. Juvekar A, Hu H, Yadegarynia S, Lyssiotis CA, Ullas S, Lien EC, Bellinger G, Son J, Hok RC, Seth P, Daly MB, Kim B, Scully R, **Asara JM**, Cantley LC, Wulf GM. Phosphoinositide 3-kinase inhibitors induce DNA damage through nucleoside depletion. *Proc Natl Acad Sci U S A.* 2016 Jul 26;113(30):E4338-47. doi:10.1073/pnas.1522223113. Epub 2016 Jul 8.
151. Cox AG, Hwang KL, Brown KK, Evason KJ, Beltz S, Tsomides A, O'Connor K, Galli GG, Yinlaimai D, Chhangawala S, Yuan M, Lien EC, Wucherpennig J, Nissim S, Minami A, Cohen DE, Camargo FD, **Asara JM**, Houvras Y, Stainier DY, Goessling W. Yap reprograms glutamine metabolism to increase nucleotide biosynthesis and enable liver growth. *Nat Cell Biol.* 2016 Aug;18(8):886-96. doi: 10.1038/ncb3389. Epub 2016 Jul 18. PubMed PMID: 27428308; PubMed Central PMCID: PMC4990146.
152. Li M, Tucker LD, **Asara JM**, Cheruiyot CK, Lu H, Wu ZJ, Newstein MC, Dooner MS, Friedman J, Lally MA, Ramratnam B. Stem-loop binding protein is a multifaceted cellular regulator of HIV-1 replication. *J Clin Invest.* 2016 Aug 1;126(8):3117-29. doi: 10.1172/JCI82360. Epub 2016 Jul 25.
153. Sousa CM, Biancur DE, Wang X, Halbrook CJ, Sherman MH, Zhang L, Kremer D, Hwang RF, Witkiewicz AK, Ying H, **Asara JM**, Evans RM, Cantley LC, Lyssiotis CA, Kimmelman AC. Pancreatic stellate cells support tumour metabolism through autophagic alanine secretion. *Nature.* 2016 Aug 10. doi: 10.1038/nature19084. [Epub ahead of print] PubMed PMID: 27509858.
154. Guo J, Chakraborty AA, Liu P, Gan W, Zheng X, Inuzuka H, Wang B, Zhang J, Zhang L, Yuan M, Novak J, Cheng JQ, Toker A, Signoretti S, Zhang Q, **Asara JM**, Kaelin WG Jr, Wei W. pVHL suppresses kinase activity of Akt in a proline-hydroxylation-dependent manner. *Science.* 2016 Aug 26;353(6302):929-32. doi: 10.1126/science.aad5755. PubMed PMID: 27563096.
155. Ricoult SJ, Dibble CC, **Asara JM**, Manning BD. Sterol Regulatory Element Binding Protein Regulates the Expression and Metabolic Functions of Wild-Type and Oncogenic IDH1. *Mol Cell Biol.* 2016 Aug 26;36(18):2384-95. doi: 10.1128/MCB.00163-16. PubMed PMID: 27354064; PubMed Central PMCID: PMC5007792.
156. Vinayagam A, Kulkarni MM, Sopko R, Sun X, Hu Y, Nand A, Villalta C, Moghimi A, Yang X, Mohr SE, Hong P, **Asara JM**, Perrimon N. An Integrative Analysis of the InR/PI3K/Akt Network Identifies the Dynamic Response to Insulin Signaling. *Cell Rep.* 2016 Sep 13;16(11):3062-74. doi: 10.1016/j.celrep.2016.08.029. PubMed PMID: 27626673; PubMed Central PMCID: PMC5033061.
157. Cox AG, Tsomides A, Kim AJ, Saunders D, Hwang KL, Evason KJ, Heidel J, Brown KK, Yuan M, Lien EC, Lee BC, Nissim S, Dickinson B, Chhangawala S, Chang CJ, **Asara JM**, Houvras Y, Gladyshev VN, Goessling W. Selenoprotein H is an essential regulator of redox homeostasis that cooperates with p53 in development and tumorigenesis. *Proc Natl Acad Sci U S A.* 2016 Sep 20;113(38):E5562-71. doi: 10.1073/pnas.1600204113. PubMed PMID: 27588899; PubMed Central PMCID: PMC5035897.

158. Park DI, Dournes C, Sillaber I, Uhr M, **Asara JM**, Gassen NC, Rein T, Ising M, Webhofer C, Filiou MD, Müller MB, Turck CW. Purine and pyrimidine metabolism: Convergent evidence on chronic antidepressant treatment response in mice and humans. *Sci Rep*. 2016 Oct 12;6:35317. doi: 10.1038/srep35317. PubMed PMID: 27731396; PubMed Central PMCID: PMC5059694.
159. Leonard PG, Satani N, Maxwell D, Lin YH, Hammoudi N, Peng Z, Pisaneschi F, Link TM, Lee GR 4th, Sun D, Prasad BA, Di Francesco ME, Czako B, **Asara JM**, Wang YA, Bornmann W, DePinho RA, Muller FL. SF2312 is a natural phosphonate inhibitor of enolase. *Nat Chem Biol*. 2016 Dec;12(12):1053-1058. doi: 10.1038/nchembio.2195. PubMed PMID: 27723749; PubMed Central PMCID: PMC5110371.
160. Fantini D, Huang S, **Asara JM**, Bagchi S, Raychaudhuri P. Chromatin association of XRCC5/6 in the absence of DNA damage depends on the XPE gene product DDB2. *Mol Biol Cell*. 2017 Jan 1;28(1):192-200. doi: 10.1091/mbc.E16-08-0573. PubMed PMID: 28035050; PubMed Central PMCID: PMC5221623.
161. Franchi L, Monteleone I, Hao LY, Spahr MA, Zhao W, Liu X, Demock K, Kulkarni A, Lesch CA, Sanchez B, Carter L, Marafini I, Hu X, Mashadova O, Yuan M, **Asara JM**, Singh H, Lyssiotis CA, Monteleone G, Opipari AW, Glick GD. Inhibiting Oxidative Phosphorylation In Vivo Restrains Th17 Effector Responses and Ameliorates Murine Colitis. *J Immunol*. 2017 Apr 1;198(7):2735-2746. doi: 10.4049/jimmunol.1600810. PubMed PMID: 28242647; PubMed Central PMCID: PMC5360504.
162. Shimizu K, Fukushima H, Ogura K, Lien EC, Nihira NT, Zhang J, North BJ, Guo A, Nagashima K, Nakagawa T, Hoshikawa S, Watahiki A, Okabe K, Yamada A, Toker A, **Asara JM**, Fukumoto S, Nakayama KI, Nakayama K, Inuzuka H, Wei W. The SCF β -TRCP E3 ubiquitin ligase complex targets Lipin1 for ubiquitination and degradation to promote hepatic lipogenesis. *Sci Signal*. 2017 Jan 3;10(460). pii: eaah4117. doi: 10.1126/scisignal.aah4117. PubMed PMID: 28049764; PubMed Central PMCID: PMC5215841.
163. Sherman MH, Yu RT, Tseng TW, Sousa CM, Liu S, Truitt ML, He N, Ding N, Liddle C, Atkins AR, Leblanc M, Collisson EA, **Asara JM**, Kimmelman AC, Downes M, Evans RM. Stromal cues regulate the pancreatic cancer epigenome and metabolome. *Proc Natl Acad Sci U S A*. 2017 Jan 31;114(5):1129-1134. doi: 10.1073/pnas.1620164114. PubMed PMID: 28096419; PubMed Central PMCID: PMC5293019.
164. Krall EB, Wang B, Munoz DM, Ilic N, Raghavan S, Niederst MJ, Yu K, Ruddy DA, Aguirre AJ, Kim JW, Redig AJ, Gainor JF, Williams JA, **Asara JM**, Doench JG, Janne PA, Shaw AT, McDonald III RE, Engelman JA, Stegmeier F, Schlabach MR, Hahn WC. KEAP1 loss modulates sensitivity to kinase targeted therapy in lung cancer. *Elife*. 2017 Feb 1;6. pii: e18970. doi: 10.7554/eLife.18970. PubMed PMID: 28145866; PubMed Central PMCID: PMC5305212.
165. Mathur D, Stratikopoulos E, Ozturk S, Steinbach N, Pegno S, Schoenfeld S, Yong R, Murty VV, **Asara JM**, Cantley LC, Parsons R. PTEN Regulates Glutamine Flux to Pyrimidine Synthesis and Sensitivity to Dihydroorotate Dehydrogenase Inhibition. *Cancer Discov*. 2017 Mar 2. doi: 10.1158/2159-8290.CD-16-0612. [Epub ahead of print] PubMed PMID: 28255082.
166. Brown KK, Spinelli JB, **Asara JM**, Toker A. Adaptive Reprogramming of De Novo Pyrimidine Synthesis Is a Metabolic Vulnerability in Triple-Negative Breast Cancer. *Cancer Discov*. 2017 Mar 2. doi: 10.1158/2159-8290.CD-16-0611. [Epub ahead of print] PubMed PMID: 28255083.

167. Patnaik A, Swanson KD, Csizmadia E, Solanki A, Landon-Brace N, Gehring MP, Helenius K, Olson BM, Pyzer AR, Wang LC, Elemento O, Novak J, Thornley TB, **Asara JM**, Montaser L, Timmons JJ, Morgan TM, Wang Y, Levantini E, Clohessy JG, Kelly K, Pandolfi PP, Rosenblatt JM, Avigan DE, Ye H, Karp JM, Signoretti S, Balk SP, Cantley LC. Cabozantinib Eradicates Advanced Murine Prostate Cancer by Activating Anti-Tumor Innate Immunity. *Cancer Discov.* 2017 Mar 8. pii: CD-16-0778. doi:10.1158/2159-8290.CD-16-0778. [Epub ahead of print] PubMed PMID: 28274958.
168. Breitkopf, S.B., Ricoult, S.J.H., Yuan, M., **Asara JM**. A Relative Quantitative Positive/Negative Ion Switching Method for Untargeted Lipidomics via High Resolution LC-MS/MS from Any Biological Source. *Metabolomics* (2017) 13: 30. doi:10.1007/s11306-016-1157-8.
169. Li X, Zhang Z, Li L, Gong W, Lazenby AJ, Swanson BJ, Herring LE, **Asara JM**, Singer JD, Wen H. Myeloid-derived cullin 3 promotes STAT3 phosphorylation by inhibiting OGT expression and protects against intestinal inflammation. *J Exp Med.* 2017 Mar 9. pii: jem.20161105. doi: 10.1084/jem.20161105. [Epub ahead of print] PubMed PMID: 28280036.
170. Gupta A, Anjomani-Virmouni S, Koundouros N, Dimitriadi M, Choo-Wing R, Valle A, Zheng Y, Chiu YH, Agnihotri S, Zadeh G, **Asara JM**, Anastasiou D, Arends MJ, Cantley LC, Poulgiannis G. PARK2 Depletion Connects Energy and Oxidative Stress to PI3K/Akt Activation via PTEN S-Nitrosylation. *Mol Cell.* 2017 Mar 16;65(6):999-1013.e7. doi: 10.1016/j.molcel.2017.02.019. PubMed PMID: 28306514.
171. Glavey SV, Naba A, Manier S, Clauser K, Tahri S, Park J, Reagan MR, Moschetta M, Mishima Y, Gambella M, Rocci A, Sacco A, O'Dwyer ME, **Asara JM**, Palumbo A, Roccaro AM, Hynes RO, Ghobrial IM. Proteomic characterization of human multiple myeloma bone marrow extracellular matrix. *Leukemia.* 2017 Apr 28. doi:10.1038/leu.2017.102. [Epub ahead of print] PubMed PMID: 28344315.
172. Park DI, Dournes C, Sillaber I, Ising M, **Asara JM**, Webhofer C, Filiou MD, Müller MB, Turck CW. Delineation of molecular pathway activities of the chronic antidepressant treatment response suggests important roles for glutamatergic and ubiquitin-proteasome systems. *Transl Psychiatry.* 2017 Apr 4;7(4):e1078. doi:10.1038/tp.2017.39. PubMed PMID: 28375208; PubMed Central PMCID: PMC5416684.
173. Ilic N, Birsoy K, Aguirre AJ, Kory N, Pacold ME, Singh S, Moody SE, DeAngelo JD, Spardy NA, Freinkman E, Weir BA, Tsherniak A, Cowley GS, Root DE, **Asara JM**, Vazquez F, Widlund HR, Sabatini DM, Hahn WC. PIK3CA mutant tumors depend on oxoglutarate dehydrogenase. *Proc Natl Acad Sci U S A.* 2017 Apr 25;114(17):E3434-E3443. doi: 10.1073/pnas.1617922114. Epub 2017 Apr 10. PubMed PMID: 28396387; PubMed Central PMCID: PMC5410781.
174. Vanhove AS, Hang S, Vijayakumar V, Wong AC, **Asara JM**, Watnick PI. *Vibrio cholerae* ensures function of host proteins required for virulence through consumption of luminal methionine sulfoxide. *PLoS Pathog.* 2017 Jun 6;13(6):e1006428. doi: 10.1371/journal.ppat.1006428. eCollection 2017 Jun. PubMed PMID: 28586382.
175. Lam HC, Baglini CV, Lope AL, Parkhitko AA, Liu HJ, Alesi N, Malinowska IA, Ebrahimi-Fakhari D, Saffari A, Yu JJ, Pereira A, Khabibullin D, Ogorek B, Nijmeh J, Kavanagh T, Handen A, Chan SY, **Asara JM**, Oldham WM, Diaz-Meco MT, Moscat J, Sahin M, Priolo C, Henske EP. p62/SQSTM1 Cooperates with Hyperactive mTORC1 to Regulate Glutathione Production,

Maintain Mitochondrial Integrity, and Promote Tumorigenesis. *Cancer Res.* 2017 Jun 15;77(12):3255-3267. doi:10.1158/0008-5472.CAN-16-2458. Epub 2017 May 16. PubMed PMID: 28512249.

176. Patnaik A, Swanson KD, Csizmadia E, Solanki A, Landon-Brace N, Gehring MP, Helenius K, Olson BM, Pyzer AR, Wang LC, Elemento O, Novak J, Thornley TB, **Asara JM**, Montaser L, Timmons JJ, Morgan TM, Wang Y, Levantini E, Clohessy JG, Kelly K, Pandolfi PP, Rosenblatt JM, Avigan DE, Ye H, Karp JM, Signoretti S, Balk SP, Cantley LC. Cabozantinib Eradicates Advanced Murine Prostate Cancer by Activating Antitumor Innate Immunity. *Cancer Discov.* 2017 Jul;7(7):750-765. doi:10.1158/2159-8290.CD-16-0778. Epub 2017 Mar 8. PubMed PMID: 28274958; PubMed Central PMCID: PMC5501767.
177. Shukla SK, Purohit V, Mehla K, Gunda V, Chaika NV, Vernucci E, King RJ, Abrego J, Goode GD, Dasgupta A, Illies AL, Gebregiworgis T, Dai B, Augustine JJ, Murthy D, Attri KS, Mashadova O, Grandgenett PM, Powers R, Ly QP, Lazenby AJ, Grem JL, Yu F, Matés JM, **Asara JM**, Kim JW, Hankins JH, Weekes C, Hollingsworth MA, Serkova NJ, Sasson AR, Fleming JB, Oliveto JM, Lyssiotis CA, Cantley LC, Berim L, Singh PK. MUC1 and HIF-1alpha Signaling Crosstalk Induces Anabolic Glucose Metabolism to Impart Gemcitabine Resistance to Pancreatic Cancer. *Cancer Cell.* 2017 Jul 10;32(1):71-87.e7. doi: 10.1016/j.ccell.2017.06.004. Erratum in: *Cancer Cell.* 2017 Sep 11;32(3):392. PubMed PMID: 28697344; PubMed Central PMCID: PMC5533091.
178. Lee HJ, Jedrychowski MP, Vinayagam A, Wu N, Shyh-Chang N, Hu Y, Min-Wen C, Moore JK, **Asara JM**, Lyssiotis CA, Perrimon N, Gygi SP, Cantley LC, Kirschner MW. Proteomic and Metabolomic Characterization of a Mammalian Cellular Transition from Quiescence to Proliferation. *Cell Rep.* 2017 Jul 18;20(3):721-736. doi:10.1016/j.celrep.2017.06.074. PubMed PMID: 28723573; PubMed Central PMCID:PMC5626450.
179. Lam HC, Liu HJ, Baglioni CV, Filippakis H, Alesi N, Nijmeh J, Du H, Lope AL, Cottrill KA, Handen A, **Asara JM**, Kwiatkowski DJ, Ben-Sahra I, Oldham WM, Chan SY, Henske EP. Rapamycin-induced miR-21 promotes mitochondrial homeostasis and adaptation in mTORC1 activated cells. *Oncotarget.* 2017 Aug 4;8(39):64714-64727. doi: 10.18632/oncotarget.19947. eCollection 2017 Sep 12. PubMed PMID: 29029388; PubMed Central PMCID: PMC5630288.
180. Shukla SK, Purohit V, Mehla K, Gunda V, Chaika NV, Vernucci E, King RJ, Abrego J, Goode GD, Dasgupta A, Illies AL, Gebregiworgis T, Dai B, Augustine JJ, Murthy D, Attri KS, Mashadova O, Grandgenett PM, Powers R, Ly QP, Lazenby AJ, Grem JL, Yu F, Matés JM, **Asara JM**, Kim JW, Hankins JH, Weekes C, Hollingsworth MA, Serkova NJ, Sasson AR, Fleming JB, Oliveto JM, Lyssiotis CA, Cantley LC, Berim L, Singh PK. MUC1 and HIF-1alpha Signaling Crosstalk Induces Anabolic Glucose Metabolism to Impart Gemcitabine Resistance to Pancreatic Cancer. *Cancer Cell.* 2017 Sep 11;32(3):392. doi: 10.1016/j.ccell.2017.08.008. PubMed PMID: 28898700.
181. Moreno-Navarrete JM, Moreno M, Ortega F, Xifra G, Hong S, **Asara JM**, Serrano JCE, Jové M, Pissios P, Blüher M, Ricart W, Portero-Otin M, Fernández-Real JM. TSHB mRNA is linked to cholesterol metabolism in adipose tissue. *FASEB J.* 2017 Oct;31(10):4482-4491. doi: 10.1096/fj.201700161R. Epub 2017 Jun 23. PubMed PMID: 28646016; PubMed Central PMCID: PMC5602896.

182. Yuan M, Breitkopf SB, **Asara JM**. Serial-omics characterization of equine urine. *PLoS One*. 2017 Oct 13;12(10):e0186258. doi: 10.1371/journal.pone.0186258. eCollection 2017. PubMed PMID: 29028822; PubMed Central PMCID: PMC5640239.
183. Krall EB, Wang B, Munoz DM, Ilic N, Raghavan S, Niederst MJ, Yu K, Ruddy DA, Aguirre AJ, Kim JW, Redig AJ, Gainor JF, Williams JA, **Asara JM**, Doench JG, Janne PA, Shaw AT, McDonald III RE, Engelman JA, Stegmeier F, Schlabach MR, Hahn WC. Correction: KEAP1 loss modulates sensitivity to kinase targeted therapy in lung cancer. *Elife*. 2017 Oct 31;6. pii: e33173. doi: 10.7554/eLife.33173. PubMed PMID: 29087937; PubMed Central PMCID: PMC5663476.
184. Hoxhaj G, Hughes-Hallett J, Timson RC, Ilagan E, Yuan M, **Asara JM**, Ben-Sahra I, Manning BD. The mTORC1 Signaling Network Senses Changes in Cellular Purine Nucleotide Levels. *Cell Rep*. 2017 Oct 31;21(5):1331-1346. doi:10.1016/j.celrep.2017.10.029. PubMed PMID: 29091770; PubMed Central PMCID: PMC5689476.
185. Glavey SV, Naba A, Manier S, Clauser K, Tahri S, Park J, Reagan MR, Moschetta M, Mishima Y, Gambella M, Rocci A, Sacco A, O'Dwyer ME, **Asara JM**, Palumbo A, Roccaro AM, Hynes RO, Ghobrial IM. Proteomic characterization of human multiple myeloma bone marrow extracellular matrix. *Leukemia*. 2017 Nov;31(11):2426-2434. doi: 10.1038/leu.2017.102. Epub 2017 Mar 27. PubMed PMID: 28344315.
186. Lobbardi R, Pinder J, Martinez-Pastor B, Theodorou M, Blackburn JS, Abraham BJ, Namiki Y, Mansour M, Abdelfattah NS, Molodtsov A, Alexe G, Toiber D, de Waard M, Jain E, Boukhali M, Lion M, Bhare D, Shah K, Gutierrez A, Stegmaier K, Silverman LB, Sadreyev RI, **Asara JM**, Oettinger MA, Haas W, Look AT, Young RA, Mostoslavsky R, Dellaire G, Langenau DM. TOX Regulates Growth, DNA Repair, and Genomic Instability in T-cell Acute Lymphoblastic Leukemia. *Cancer Discov*. 2017 Nov;7(11):1336-1353. doi: 10.1158/2159-8290.CD-17-0267. Epub 2017 Oct 3. PubMed PMID: 28974511; PubMed Central PMCID: PMC5683427.
187. Breitkopf SB, Taveira MO, Yuan M, Wulf GM, **Asara JM**. Serial-omics of P53^{-/-}, Brca1^{-/-} Mouse Breast Tumor and Normal Mammary Gland. *Sci Rep*. 2017 Nov 6;7(1):14503. doi: 10.1038/s41598-017-15132-y. PubMed PMID: 29109428; PubMed Central PMCID: PMC5674068.
188. Valvezan AJ, Turner M, Belaid A, Lam HC, Miller SK, McNamara MC, Baglini C, Housden BE, Perrimon N, Kwiatkowski DJ, **Asara JM**, Henske EP, Manning BD. mTORC1 Couples Nucleotide Synthesis to Nucleotide Demand Resulting in a Targetable Metabolic Vulnerability. *Cancer Cell*. 2017 Nov 13;32(5):624-638.e5. doi:10.1016/j.ccell.2017.09.013. Epub 2017 Oct 19. PubMed PMID: 29056426; PubMed Central PMCID: PMC5687294.
189. Weckmann K, Deery MJ, Howard JA, Feret R, **Asara JM**, Dethloff F, Filiou MD, Iannace J, Labermaier C, Maccarrone G, Webhofer C, Teplytska L, Lilley K, Müller MB, Turck CW. Ketamine's antidepressant effect is mediated by energy metabolism and antioxidant defense system. *Sci Rep*. 2017 Nov 17;7(1):15788. doi:10.1038/s41598-017-16183-x. PubMed PMID: 29150633; PubMed Central PMCID: PMC5694011.
190. Kamareddine L, Wong ACN, Vanhove AS, Hang S, Purdy AE, Kierek-Pearson K, **Asara JM**, Ali A, Morris JG Jr, Watnick PI. Activation of *Vibrio cholerae* quorum sensing promotes survival of an arthropod host. *Nat Microbiol*. 2017 Nov 27. doi:10.1038/s41564-017-0065-7. [Epub ahead of print] PubMed PMID: 29180725.

191. Bowden JA, Heckert A, Ulmer CZ, Jones CM, Koelmel JP, Abdullah L, Ahonen L, Alhouti Y, Armando AM, **Asara JM**, Bamba T, Barr JR, Bergquist J, Borchers CH, Brandsma J, Breitkopf SB, Cajka T, Cazenave-Gassiot A, Checa A, Cinel MA, Colas RA, Cremers S, Dennis EA, Evans JE, Fauland A, Fiehn O, Gardner MS, Garrett TJ, Gotlinger KH, Han J, Huang Y, Neo AH, Hyötyläinen T, Izumi Y, Jiang H, Jiang H, Jiang J, Kachman M, Kiyonami R, Klavins K, Klose C, Köfeler HC, Kolmert J, Koal T, Koster G, Kuklennyik Z, Kurland IJ, Leadley M, Lin K, Maddipati KR, McDougall D, Meikle PJ, Mellett NA, Monnin C, Moseley MA, Nandakumar R, Oresic M, Patterson R, Peake D, Pierce JS, Post M, Postle AD, Pugh R, Qiu Y, Quehenberger O, Ramrup P, Rees J, Rembiesa B, Reynaud D, Roth MR, Sales S, Schuhmann K, Schwartzman ML, Serhan CN, Shevchenko A, Somerville SE, St John-Williams L, Surma MA, Takeda H, Thakare R, Thompson JW, Torta F, Triebel A, Trötz Müller M, Ubhayasekera SJK, Vuckovic D, Weir JM, Welti R, Wenk MR, Wheelock CE, Yao L, Yuan M, Zhao XH, Zhou S. Harmonizing lipidomics: NIST interlaboratory comparison exercise for lipidomics using SRM 1950-Metabolites in Frozen Human Plasma. *J Lipid Res.* 2017 Dec;58(12):2275-2288. doi: 10.1194/jlr.M079012. Epub 2017 Oct 6. PubMed PMID: 28986437; PubMed Central PMCID: PMC5711491.
192. Chandrasekaran S, Zhang J, Sun Z, Zhang L, Ross CA, Huang YC, **Asara JM**, Li H, Daley GQ, Collins JJ. Comprehensive Mapping of Pluripotent Stem Cell Metabolism Using Dynamic Genome-Scale Network Modeling. *Cell Rep.* 2017 Dec 5;21(10):2965-2977. doi: 10.1016/j.celrep.2017.07.048. PubMed PMID: 29212039.
193. Lien EC, Ghisolfi L, Geck RC, **Asara JM**, Tokar A. Oncogenic PI3K promotes methionine dependency in breast cancer cells through the cystine-glutamate antiporter xCT. *Sci Signal.* 2017 Dec 19;10(510). pii: eaa06604. doi: 10.1126/scisignal.aa06604. PubMed PMID: 29259101.
194. Chen J, Guccini I, Mitri DD, Brina D, Revandkar A, Sarti M, Pasquini E, Alajati A, Pinton S, Losa M, Civenni G, Catapano CV, Sgrignani J, Cavalli A, D'Antuono R, **Asara JM**, Morandi A, Chiarugi P, Crotti S, Agostini M, Montopoli M, Masgras I, Rasola A, Garcia-Escudero R, Delaleu N, Rinaldi A, Bertoni F, Bono J, Carracedo A, Alimonti A. Compartmentalized activities of the pyruvate dehydrogenase complex sustain lipogenesis in prostate cancer. *Nat Genet.* 2018 Jan 15. doi: 10.1038/s41588-017-0026-3. [Epub ahead of print] PubMed PMID: 29335542.
195. Chen M, Zhang J, Sampieri K, Clohessy JG, Mendez L, Gonzalez-Billalabeitia E, Liu XS, Lee YR, Fung J, Katon JM, Menon AV, Webster KA, Ng C, Palumbieri MD, DiIombi MS, Breitkopf SB, Teruya-Feldstein J, Signoretti S, Bronson RT, **Asara JM**, Castillo-Martin M, Cordon-Cardo C, Pandolfi PP. An aberrant SREBP-dependent lipogenic program promotes metastatic prostate cancer. *Nat Genet.* 2018 Jan 15. doi: 10.1038/s41588-017-0027-2. [Epub ahead of print] PubMed PMID: 29335545.
196. Wan L, Xu K, Wei Y, Zhang J, Han T, Fry C, Zhang Z, Wang YV, Huang L, Yuan M, Xia W, Chang WC, Huang WC, Liu CL, Chang YC, Liu J, Wu Y, Jin VX, Dai X, Guo J, Liu J, Jiang S, Li J, **Asara JM**, Brown M, Hung MC, Wei W. Phosphorylation of EZH2 by AMPK Suppresses PRC2 Methyltransferase Activity and Oncogenic Function. *Mol Cell.* 2018 Jan 18;69(2):279-291.e5. doi: 10.1016/j.molcel.2017.12.024. PubMed PMID: 29351847; PubMed Central PMCID: PMC5777296.
197. Kamareddine L, Wong ACN, Vanhove AS, Hang S, Purdy AE, Kierek-Pearson K, **Asara JM**, Ali A, Morris JG Jr, Watnick PI. Activation of *Vibrio cholerae* quorum sensing promotes survival

of an arthropod host. *Nat Microbiol.* 2018 Feb;3(2):243-252. doi: 10.1038/s41564-017-0065-7. Epub 2017 Nov 27. PubMed PMID: 29180725.

Non-peer Reviewed Scholarship:

Letters to the Editor

1. **Asara, J.M.**; Garavelli, J.S.; Slatter, D.A.; Schweitzer, M.H.; Freimark, L.M.; Phillips, M.; Cantley, L.C. Interpreting Sequences from Mastodon and *T. rex*. *Science*. 2007;317:1324-1325.
2. **Asara, J.M.**; Schweitzer, M.H.; Cantley, L.C.; Cottrell, J.S. Response to comment on "Protein sequences from mastodon and *Tyrannosaurus rex* revealed by mass spectrometry. *Science*. 2008; 321:1040.
3. **Asara, J.M.**; Schweitzer, M.H. Response to comment on "Protein sequences from mastodon and *Tyrannosaurus rex* revealed by mass spectrometry. *Science*. 2008; 319:33.
4. Breitkopf SB, Yuan M, Pihan GA, **Asara JM**. Reply to MacLeod et al.: Multiple myeloma plasma cells have chameleon characteristics. *Proc Natl Acad Sci U S A*. 2013 Jan 22;110(4):E272.
5. Sousa CM, Biancur DE, Wang X, Halbrook CJ, Sherman MH, Zhang L, Kremer D, Hwang RF, Witkiewicz AK, Ying H, **Asara JM**, Evans RM, Cantley LC, Lyssiotis CA, Kimmelman AC. Erratum: Pancreatic stellate cells support tumour metabolism through autophagic alanine secretion. *Nature*. 2016 Dec 1;540(7631):150.

Thesis

1999 Michigan State University "*Enhancing spectra in desorption/ionization mass spectrometry through the use of chemical additives*"

- Developed methods for mass spectral signal enhancement of highly charged biological molecules such as oligonucleotides, phosphopeptides, and DNA-metal complexes

Narrative Report

As an Assistant Professor in the Division of Signal Transduction in Harvard Medical School's Department of Medicine and the Director of the Mass Spectrometry Core at Beth Israel Deaconess Medical Center, I have collaborated with nearly 200 investigators over the last twelve years and have developed a state-of-the-art mass spectrometry facility that attracts local, national and international researchers. In addition to core collaborative and service based projects, I lead several research efforts externally funded by the NIH. These internal research efforts in combination with external collaborations have resulted in 190 peer reviewed national publications and invitations to speak at national and international mass spectrometry, -omics, health and biotechnology conferences. Most notably, I improved the lab dramatically over the last several years by securing three grants (NIH and BIDMC capital funds) to fund ultra-high resolution and mass accuracy Orbitrap mass spectrometers (QExactive HF and QExactive Plus), the gold standard in high resolution mass spectrometry instrumentation, dedicated to non-targeted lipidomics, metabolomics and phosphoproteomics. We also incorporated hybrid triple quadrupole (5500 QTRAP) that we use exclusively for quantitative targeted metabolomics and ¹³C/¹⁵N

metabolic flux analysis, technology that we incorporated five years ago. We also utilize an Orbitrap Elite mass spectrometer for overflow proteomics work including identification and protein complex analyses.

The main area of my research involves the use of various mass spectrometry technologies to study the integration of metabolomics, lipidomics and phosphoproteomics (*Triomics*) as well as the study of protein complexes in signaling pathways for diseases such as cancer and the goal is to identify new targets for “smart” drugs that specifically inhibit the pathways that are driving cell growth, proliferation and metastasis rather than a chemotherapy approach. The lab is gaining a national reputation for the integration of different –omics technologies as demonstrated by several publications and invited seminars. We recently used a combination of metabolomics, metabolomics flux, global phosphoproteomics and lipidomics from BCR/ABL positive H929 multiple myeloma cells to assemble a model showing that only does imatinib abrogate signaling via the BCR/ABL-ERK-TOR pathway, but a collection of phosphosites are elevated in the spliceosome which block transcription and result in an accumulation of free RNA nucleotides. This also results in a decrease in fatty acid synthesis and lipid biosynthesis. The nuclear phosphorylation events and metabolic consequences were unexpected (Breitkopf et al., *Anal. Chem.*, 2015). The study included triple SILAC stable isotope labeling for IMAC purified phosphopeptides as well as ¹³C glucose and glutamine labeled metabolites. We are extending this research to include *Serial-Omics*, a technology platform that we developed recently which begins with a single piece of tissue and a liquid-liquid extraction is performed whereby we use three different layers for proteomics, metabolomics and lipidomics (Breitkopf et al., *Sci. Reports*, 2017; Yuan et al., *PLoS One*, 2017).

We are also very interested in studying protein-protein interactions from model species and human disease models to find novel interactions that may conserved through evolution. To that end, we recently published a study where we analyzed PI3K immunoprecipitations from a variety of human cancers under various drugs and stimuli and compared those to drosophila cells under various stimuli using a label-free quantitative technology that we developed several years ago (Asara et al., *Proteomics*, 2008) to discover that the P85 regulatory subunit of PI3K binds directly to the tyrosine phosphatase SHP2 in an AKT independent manner. We believe that the pool of free P85 that is not bound to P110 (catalytic subunit of PI3K) when activating AKT is tied up with SHP2 and not truly free (Breitkopf et al. *Sci. Reports*, 2016).

Approximately six years ago, we developed and implemented a hybrid triple quadrupole (QTRAP) mass spectrometry based platform for profiling more than 300 endogenous cellular metabolites in a single LC-MS/MS run using selected reaction monitoring (SRM) and pos/neg polarity switching (Yuan et al., *Nature Protoc.*, 2012) that covers all major and metabolic pathways in cancers. We are studying the effects of various stimulations and drug treatments on cancer cells both mutant and endogenous and the metabolic consequences of such events to search for new metabolic pathway drug targets. We are also profiling metabolites from clinical tissues to search for biomarkers. This platform has resulting in major research publications in the journals *Nature*, *Science*, *Cell*, *Cancer Discovery*, *Mol. Cell*, etc. We are actively using both steady-state and ¹³C/¹⁵N stable isotope labeling for targeted metabolomics and lipidomics. A couple of studies where we developed significant custom sets of both ¹⁵N and ¹³C labeling methods from glucose, glutamine, etc. were in collaboration Dr. Brendan Manning’s lab at Harvard School of Public Health where we identified novel mTOR and S6K control of pyrimidine synthesis via (Ben-Sahra et al., *Science*, 2013) and also mTORC1’s control in purine synthesis (Ben-Sahra et al., *Science*, 2016).

We also have shown that a signaling strategy using co-immunoprecipitation and LC-MS/MS or IP-MS can be used to identify key signaling events controlling particular cancers. We use a combination of a pTyr IP, p85 IP and Grb2 IP and integrate the resulting network. We used this strategy to identify a novel BCR/ABL mutation in H929 multiple myeloma cells (Breitkopf et al., *Proc. Nat. Acad. Sci. U.S.A.*, 2012). This is an extension of work that showed that we can quantify the binding partners of PI3K using label free mass spectrometry in a variety of human cancers and under various treatment conditions to assess the adaptor use and activation state of each PI3K driven tumor (Yang et al., *Cancer Res.*, 2011).

We have shown over the last few years that metabolism plays a key role in cancer progression and we have been performing mass spectrometry based non-labeled and ^{13}C and ^{15}N labeled metabolic flux experiments to help find altered metabolism in cancers and their response to drug treatments.

Several articles in *Science* over the last ten years received national media attention as they discussed the sequencing of multi-million year collagen proteins extracted from *Tyrannosaurus rex* and *B. canadensis* fossil bones (Asara et. al., *Science*, 2007; Asara et. al., *Science* 2008, Schweitzer et. al., *Science*, 2009) and showed a molecular phylogenetic relationship to birds for the first time. I remain active in the development of new methods to sequence ancient fossils and uncovering the phylogenetics of both extinct and extant organisms as these applications continue to challenge our sensitivity capabilities needed for studying low level signaling proteins from tumors. Additionally, software that has been developed for finding subtle sequence changes in conserved proteins such as collagen in ancient species is now used by our laboratory for finding protein level mutations in human cancers.

Our newest technology using high resolution QExactive Orbitrap mass spectrometers focusses on the global untargeted lipidome from cells, tissues, bodily fluids, etc. We can identify more 1500 lipid molecules using this LC-MS/MS based strategy, not just lipid classes and fatty acid content but the actual composition of each individual lipid. Our latest endeavor involves labeling lipid molecules with ^{13}C and ^{15}N tracers to study lipid biochemistry in cancers and related diseases. These applications involve both targeted and untargeted approaches. We have shown progress in understanding the pathways affecting metabolism and fatty acid synthesis in TSC2^{-/-} cells, critical for Hamartoma syndromes and we have assessed lipid profiles in multiple human and mouse tumors (Breitkopf et. al., *Metabolomics*, 2017).

Teaching is an important focus of my lab and in that regard; I have taken part in numerous workshops on mass spectrometry technology including proteomics and metabolomics teaching seminars for the DF/HCC, HMS and BIDMC to teach both faculty and students. In addition, I personally formally supervise senior researchers, students and postdoctoral fellows in my laboratory. In addition, I teach students and post-docs from collaborating laboratories how to operate mass spectrometry instrumentation and how to prepare samples in order to answer biological questions related to diseases such as cancer, diabetes, etc. I also teach workshops in national conferences on various mass spectrometry topics and am heavily involved in research groups for biotechnology societies that involve teaching and tutorial components.

In addition to research and teaching activities, as the director of one of the medical center's core facilities, I provide daily service (50% of my effort) to local researchers in their quest to cure and treat debilitating diseases such as cancer. The service goes beyond instrumental analyses but extends to help in grant writing and presentations to local laboratories and investigators. I am committed to this endeavor of providing service to the academic and clinical research community.