

Michael A. Swanson

Email: michael.swanson@colorado.edu

EDUCATION

Ph.D. - Chemistry, University of Denver, Denver, CO (September 2005 – June 2010)

Advisor: Professor Sandra S. Eaton

Dissertation: “Mechanistic Importance of Redox Potentials and Conformational Flexibility in Electron Transferring Flavoproteins”

BS - Chemical Engineering, University of Colorado, Boulder, CO (August 1997 – May 2002)

BA - Biochemistry, University of Colorado, Boulder, CO (August 1997 – May 2002)

ACADEMIC POSITIONS

2025 – Pres. *Assistant Teaching Professor*, Chemistry Department, University of Colorado
2024 – 2024 *Part-Time Instructor*, Chemistry Department, University of Colorado
2023 – 2025 *Senior Instructor*, Pediatrics Department, University of Colorado Anschutz Campus
2020 – 2024 *Adjunct Instructor*, Department of Chemistry and Biochemistry, University of Colorado Denver
2015 – 2023 *Instructor*, Pediatrics Department, University of Colorado Anschutz Campus
2012 – 2023 *Adjunct Faculty*, Department of Chemistry & Biochemistry, University of Denver
2012 – 2015 *Research Associate*, Pediatrics Department, University of Colorado
2012 – 2012 *Temporary Aide*, Department of Pediatrics, University of Colorado
2010 – 2011 *Postdoctoral Research Associate*, Department of Chemistry and Biochemistry, University of Denver
2005 – 2010 *Graduate Research Assistant*, Department of Chemistry and Biochemistry, University of Denver
1999 – 2000 *Undergraduate Research Assistant*, Department of Chemical and Biological Engineering, University of Colorado, Boulder

INDUSTRIAL POSITIONS

2011 – 2012 *Chemical Consultant*, Certol International, Commerce City, CO
2005 – 2005 *Technician*, AMGEN, Longmont, CO
2003 – 2005 *Research Technician*, Eltron Research Inc., Boulder, CO

TEACHING EXPERIENCE

Have instructed at 4 different institutions/campuses, including 12 semester and 29 quarter courses.

Totals: Instructed 3426 Students in full-time lectured courses, 1122 students in lab courses.

Number of courses instructed by subject: General Chemistry – 18
Biochemistry – 18
General Chemistry Lab – 3
Inorganic Chemistry – 2

At the University of Colorado, Boulder

Lectures:

CHEM 1113 General Chemistry I

Spring 2026	2 Sections	752 Students	Avg Instructor Rating – Ongoing
Fall 2025	2 Sections	542 Students	Avg Instructor Rating – 4.18 / 5

CHEM 1133 General Chemistry I

Spring 2025	1 Section	202 Students	Avg Instructor Rating – 3.86 / 5
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Labs:

CHEM 1114 General Chemistry I Lab Instructor

Spring 2026	43 Sections	909 Students	Avg Instructor Rating – Ongoing
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At the University of Colorado, Denver Auraria Campus

CHEM 4810 General Biochemistry I

Fall 2023*	36 Students	Instructor Rating – 4.14 / 5.0
Spring 2023*	16 Students	Instructor Rating – 3.83 / 5.0
Fall 2022*	27 Students	Instructor Rating – 4.09 / 5.0
Spring 2022*	20 Students	Instructor Rating – 3.6 / 5.0
Fall 2021*	40 Students	Instructor Rating – 3.04 / 5.0
Spring 2021 (*Zoom)	15 Students	Instructor Rating – 4.4 / 5.0
Fall 2020 (*Zoom)	35 Students	Instructor Rating – 3.86 / 5.0

CHEM 4820 General Biochemistry II

Spring 2024*	40 Students	Instructor Rating – 4.19 / 5.0
Spring 2023*	28 Students	Instructor Rating – 3.53 / 5.0

At the University of Colorado, Anschutz Medical Campus

GENC 6140 Human Inborn Errors of Metabolism

Spring 2024	1 Lecture (Organic/Biochemistry Review)	18 Students	Rating – NA
Spring 2022	1 Lecture (Organic/Biochemistry Review)	15 Students	Rating – NA
Spring 2020	1 Lecture (Organic/Biochemistry Review)	10 Students	Rating – 4.7 / 6.0
Spring 2018	1 Lecture (Organic/Biochemistry Review)	17 Students	Rating – 4.7 / 6.0

GENC 6121 Laboratory in Clinical Cytogenetics and Molecular Genetics

Fall 2023	1 Lecture (qPCR, MLPA and aCGH)	8 Students	Rating – NA
Fall 2022	1 Lecture (qPCR, MLPA and aCGH)	7 Students	Rating – NA
Fall 2021	1 Lecture (qPCR, MLPA and aCGH)	6 Students	Rating – 4.8 / 6.0
Fall 2020	1 Lecture (qPCR, MLPA and aCGH)	6 Students	Rating – 4.0 / 6.0
Fall 2019	1 Lecture (qPCR, MLPA and aCGH)	8 Students	Rating – 4.7 / 6.0
Fall 2018	1 Lecture (qPCR, MLPA and aCGH)	6 Students	Rating – 4.7 / 6.0
Fall 2017	1 Lecture (qPCR, MLPA and aCGH)	6 Students	Rating – 5.5 / 6.0

At the University of Denver

CHEM 3813 Biochemistry III – Nucleic Acids

Spring 2024*	22 Students	Instructor Rating – 3.75 / 6.0
Spring 2016	21 Students	Instructor Rating – 5.0 / 6.0

Spring 2015	38 Students	Instructor Rating – 5.2 / 6.0
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CHEM 3812 Biochemistry II – Membranes and Metabolism

Spring 2024*	19 Students	Instructor Rating – 5.0 / 6.0
Spring 2023*	38 Students	Instructor Rating – 4.3 / 6.0
Winter 2021 (*Zoom)	38 Students	Instructor Rating – 3.71 / 6.0
Winter 2017	35 Students	Instructor Rating – 5.41 / 6.0
Winter 2016	54 Students	Instructor Rating – 4.9 / 6.0
Winter 2015	37 Students	Instructor Rating – 5.46 / 6.0

CHEM 3811 Biochemistry I - Proteins

Fall 2017	34 Students	Instructor Rating – NA (Took over midway)
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CHEM 2131 Chemistry of the Elements (Inorganic Chemistry)

Spring 2023*	82 Students	Instructor Rating – 5.08 / 6.0
Spring 2019	62 Students	Instructor Rating – 5.43 / 6.0

CHEM 1020 General Chemistry II

Winter 2024*	75 Students	Instructor Rating – 5.27 / 6.0
Winter 2023*	77 Students	Instructor Rating – 5.39 / 6.0
Winter 2020	67 Students	Instructor Rating – 5.04 / 6.0
Winter 2019	66 Students	Instructor Rating – 5.38 / 6.0
Winter 2018	92 Students	Instructor Rating – 5.55 / 6.0

CHEM 1010 General Chemistry I

Fall 2023*	83 Students	Instructor Rating – 4.85 / 6.0
Fall 2022*	75 Students	Instructor Rating – 4.55 / 6.0
Fall 2020 (*Zoom)	70 Students	Instructor Rating – 4.67 / 6.0
Fall 2019	78 Students	Instructor Rating – 4.96 / 6.0
Summer 2018	16 Students	Instructor Rating – 5.5 / 6.0
Fall 2017	79 Students	Instructor Rating – 5.61 / 6.0
Summer 2017	13 Students	Instructor Rating – 5.43 / 6.0
Fall 2016	92 Students	Instructor Rating – 5.77 / 6.0
Fall 2015	78 Students	Instructor Rating – 5.4 / 6.0
Fall 2014	74 Students	Instructor Rating – 5.5 / 6.0
Summer 2014	12 Students	Instructor Rating – 5.75 / 6.0
Fall 2013	73 Students	Instructor Rating – 5.22 / 6.0
Fall 2012	73 Students	Instructor Rating – 4.33 / 6.0

(86.5% class attendance estimated from clicker responses)

LAB:

CHEM 1240 General Chemistry Lab

Summer 2018	16 Students	Instructor Rating – NA
Summer 2017	13 Students	Instructor Rating – 5.43 / 6.0

As TA:

CHEM 1240 General Chemistry Lab

Fall 2009	17 Students	Instructor Rating – 4.5 / 5.0
Fall 2005	29 Students	Instructor Rating – 4.4 / 5.0

CHEM 2141 Chemistry of the Elements (Inorganic) Lab
 Spring 2008 20 Students Instructor Rating – 4.6 / 5.0
 Spring 2006 31 Students Instructor Rating – 4.8 / 5.0

CHEM 2041 Analysis of Equilibrium Systems (Analytical) Lab
 Winter 2007 15 Students Instructor Rating – 4.5 / 5.0

NATS 1211 Science Contemporary Issues I Lab
 Fall 2006 36 Students Instructor Rating – 4.5 / 5.0

NATS 1212 Science Contemporary Issues II Lab
 Winter 2006 36 Students Instructor Rating – 4.7 / 5.0

*Denotes fully “flipped” or “hybrid” class format where lectures are recorded and class time is spent working through problems

MENTORING

2006	Arwen Christian	Undergraduate Research
2006	Basel Touban	Undergraduate Research
2007	Maria Steblyanko	Graduate Interterm Project
2007	Sam Schroeder	Undergraduate Research Project
2008	Michelle Collier	Undergraduate Research Project
2009	Josh Biller	Graduate Interterm Project
2010	Priyanka Aggarwal	Graduate Research
2010	Ayisha Siddiqua	Graduate Research
2011	Jackie Toomey	Undergraduate Research
2011	Virginia Meyer	Graduate Research
2014	Meghan Savage	Graduate Research Lab Rotation
2015	Stephanie Garcia	Graduate Research Lab Rotation
2016	Mihret Elos	Graduate Research
2017	Mezhgan Aslamy	BIOL3939 Research Internship (UC Denver)
2017	Leilani Rodriguez	BIOL3939 Research Internship (UC Denver)
2021	Stefanos Koutsoukos	Graduate Research Lab Rotation

PUBLICATIONS

PEER REVIEWED JOURNAL ARTICLES:

25. Swanson, M. A., Jiang, H., Kolora, L. D., Molino, R., Reisdorph, R., Michel, C. R., Doenges, K. A., Leung, K.-Y., Lin, X., Wong, F., Lancaster, S., Michael, B., Synder, M., Hock, D. H., Stroud, D. A., Wood, T., Binard, R., Anderson-Lehman, L., Christians, U., Arning, E., Friederich, M. W., Van Hove, R. A., MacLean, K. N., Greene, N. D. E. and Van Hove, J. L. K. (2026) **A nonketotic hyperglycinemia mouse shows wide-ranging biochemical consequences of elevated glycine, Reduced folate one-carbon charging, and serine deficiency** *J Inherit Metab Dis* 49, e70137. ([Link to pdf](#))

24. Selvanathan, A., Hertzog, A., Coughlin II, C. R., Swanson, M. A. and Van Hove, J. L. K. (2026) **The history and nosology of the glycine disorders: A framework for clinicians**, *J Inherit Metab* 49, e70138. ([Link to pdf](#))
23. Swanson, M. A., Jiang, H., Busquet, N., Carlsen, J., Brindley, C., Beneke, T. A., Van Hove, R. A., Friederich, M. W., MacLean, K. N., Mesches, M. H. and Van Hove, J. L. K. (2024) **Deep postnatal phenotyping of a new mouse model of nonketotic hyperglycinemia**. *J Inherit Metab Dis* 47, 971-990. ([Link to pdf](#))
22. Arribas-Carreira, L., Dallabona, C., Swanson, M. A., Farris, J., Østergaard, E., Tsiakas, K., Hempel, M., Aquaviva-Bourdain, C., Koutsoukos, S., Stence, N. V., Magistrati, M., Spector, E. B., Kronquist, K., Christensen, M., Karstensen, H. G., Feichtinger, R. G., Achleitner, M. T., Lawrence Merritt, J., Pérez, B., Ugarte, M., Grünewald, S., Riela, A. R., Julve, N., Arnoux, J. B., Haldar, K., Donnini, C., Santer, R., Lund, A. M., Mayr, J. A., Rodriguez-Pombo, P. and Van Hove, J. L. K. (2023) **Pathogenic variants in GCSH encoding the moonlighting H-protein cause combined Nonketotic Hyperglycinemia and Lipoate Deficiency**. *Hum Mol Genet*, 32, 917-933. ([Link to pdf](#))
21. Swanson, M. A., Miller, K., Young, S. P., Tong, S., Ghaloul-Gonzalez, L., Neira-Fresneda, J., Schlichting, L., Peck, C., Gabel, L., Friederich, M. W. and Van Hove, J. L. K. (2022) **Cerebrospinal fluid amino acids glycine, serine, and threonine in nonketotic hyperglycinemia**. *J Inherit Metab Dis* 45, 734-747. ([Link to pdf](#)).
20. Wempe, M. F., Kumar, A., Kumar, V., Choi, Y. J., Swanson, M. A., Friederich, M. W., Hyland, K., Yue, W. W., Van Hove, J. L. K. and Coughlin, C. R. 2nd. (2019) **Identification of a novel biomarker for pyridoxine-dependent epilepsy: Implications for newborn screening**. *J Inherit Metab Dis*. 42, 565-574. ([Link to pdf](#))
19. Coughlin II, C. R., Swanson, M. A., Spector, E., Kronquist, K. E. and Van Hove, J. L. K. (2018) **Comment on Late-Onset Nonketotic Hyperglycinemia With a Heterozygous Novel Point Mutation of the GLDC Gene**. *Pediatric Neurology* 79, e1. ([Link to pdf](#))
18. Coughlin II, C. R., Swanson, M. A., Spector, E., Meeks, N. J. L., Kronquist, K. E., Aslamy, M., Wempe, M. F., van Karnebeek, C. D. M., Gospe Jr., S. M., Aziz, V. G., Tsai, B. P., Gao, H., Nagy, P. L., Hyland, K., van Dooren, S. J. M., Salomons, G. S. and Van Hove, J. L. K. (2018) **The genotypic spectrum of ALDH7A1 mutations resulting in pyridoxine dependent epilepsy: a common epileptic encephalopathy**. *Journal of Inherited Metabolic Disease*, published online ahead of print. ([Link to pdf](#))
17. Vantroys, E., Larson, A., Friederich, M., Knight, K., Swanson, M. A., Powell, C. A., Smet, J., Vergult, S., De Paepe, B., Seneca, S., Roeyers, H., Menten, B., Minczuk, M., Vanlander, A., Van Hove, J. L. K. and Van Coster, R. (2017) **New insights into the phenotype of FARS2 deficiency**, *Molecular Genetics and Metabolism* 122, 172-181. ([Link to pdf](#))
16. Swanson, M. A., Garcia, S. M., Spector, E., Kronquist, K., Creadon-Swindell, G., Walter, M., Christensen, E., Van Hove, J. L. K. and Sass, J. O. (2017) **D-Glyceric aciduria does not cause nonketotic hyperglycinemia: A historic co-occurrence**, *Molecular Genetics and Metabolism* 121, 80-82. ([Link to pdf](#))

15. Bravo-Alonso, I., Navarrete, R., Arribas, L., Perona, A., Abia, D., Couce, M. L., García-Cazorla, A., Moraes, A., Domingo, R., García, A., Ramos, M. A., Swanson, M. A., Van Hove, J. L. K., Ugarte, M., Pérez, B., Pérez-Cerdá, C. and Rodríguez-Pombo P. (2017) **Nonketotic Hyperglycinemia: functional assessment of missense variants in GLDC to understand phenotypes of the disease**, *Human Mutation* 6, 678-691. ([Link to pdf](#))
14. Coughlin II, C. R., Swanson, M. A., Kronquist, K., Acquaviva, C., Hutchin, T., Rodríguez-Pombo, P., Väisänen, M- L., Spector, E., Creadon-Swindel, G., Brás-Goldberg, A. M., Rahikkala, E., Moilanen, J. S., Mahieu, V., Matthijs, G., Bravo-Alonso, I., Pérez-Cerdá, C., Ugarte, M., Vinaey-Saban, C., Scharer, G. H. and Van Hove, J. L. K. (2017) **The genetic basis of classic nonketotic hyperglycinemia due to mutations in GLDC and AMT**, *Genetics in Medicine* 19, 104-111. ([Link to pdf](#))
13. Bjoraker, K., Swanson, M. A., Coughlin II, C. R., Christodoulou, J., Tan, E. S., Fergeson, M., Dyack, S., Ahmad, A., Friederich, M. W., Spector, E., Creadon-Swindel, G., Hodge, M. A., Gaughan, S., Burns, C. and Van Hove, J. L. K. (2016) **Neurodevelopmental Outcome and Treatment Efficacy of Benzoate and Dextromethorphan in Siblings with Attenuated Nonketotic Hyperglycinemia**, *The Journal of Pediatrics* 170, 234-239. ([Link to pdf](#))
12. Swanson, M. A., Coughlin II, C. R., Scharer, G. H., Szerlong, H., Bjoraker, K., Spector, E., Creadon-Swindel, G., Mahieu, V., Matthijs, G., Hennermann, J., Applegarth, D., Toone, J., Tong, S., Williams, K. and Van Hove, J. L. K. (2015) **Biochemical and Molecular Predictors for Prognosis in Nonketotic Hyperglycinemia**, *Annals of Neurology* 78, 608-616. ([Link](#))
11. Coughlin II, C. R., Scharer, G. H., Friederich, M. W., Yu, H- C., Geiger, E. A., Creadon-Swindel, G., Collins, A., Vanlander, A. V., Van Coster, R., Powell, C. A., Swanson, M. A., Minczuk, M., Van Hove, J. L. K. and Shaikh, T. H. (2015) **Mutations in the mitochondrial cysteinyl-tRNA synthase gene, CARS2, lead to a severe epileptic encephalopathy and complex movement disorder**, *Journal of Medical Genetics* 52, 532-540. ([Link to pdf](#))
10. Meyer, V., Swanson, M. A., Clouston, L. J., Boratynski, P. J., Stein, R. A., Mchaourab, H., Rajca, A., Eaton, S. S. and Eaton, G. R. (2015) **Room-Temperature Distance Measurements of Immobilized Spin-Labeled Protein by DEER/PELDOR**, *Biophysical Journal* 108, 1213-1219. ([Link to pdf](#))
9. Chatfield, K. C., Coughlin II, C. R., Friederich, M. W., Gallagher, R. C., Lovell, M. A., Ofman, R., Swanson, M. A., Thomas, J. A., Wanders, R. J. A., Wartchow, E. P. and Van Hove, J. L. K. (2015) **Mitochondrial energy failure in HSD10 disease is due to defective mtDNA transcript processing**, *Mitochondrion* 21, 1-10. ([Link to pdf](#))
8. Baker II, P. R.,* Friederich, M. W.,* Swanson, M. A.,* Shaikh, T., Bhattacharya, K., Scharer, G. H., Aicher, J., Creadon-Swindel, G., Geiger, E., MacLean, K. N., Lee, W- T., Deshpande, C., Freckmann, M- L., Shih, L- Y., Wasserstein, M., Rasmussen, M. B., Lund, A. M., Procopis, P., Cameron, J. M., Robinson, B. H., Brown, G. K., Brown, R. M., Compton, A. G., Dieckmann, C. L., Collard, R., Coughlin II, C. R., Spector, E., Wempe, M. F. and Van Hove, J. L. K. (2014) **Variant non-ketotic hyperglycinemia is caused by mutations in LIAS, BOLA3, and the novel gene GLRX5**, *Brian* 137, 366-379. ([Link to pdf](#)) *Contributed Equally

7. Rajca, A., Wang, Y., Boska, M., Paletta, J. T., Olankitwanit, A., Swanson, M. A., Mitchell, D. G., Eaton, S. S., Eaton, G. R. and Rajca, S. (2012) **Organic Radical Contrast Agents for Magnetic Resonance Imaging**, *J. Am. Chem. Soc.* *134*, 15724-15727. ([Link to pdf](#)).
6. Rivera, E. J., Sethi, R., Qu, F., Krishnamurthy, R., Muthupillai, R., Alford, M., Swanson, M. A., Eaton, S. S., Eaton, G. R. and Wilson, L. J. (2012) **Nitroxyl radicals@US-Tubes: New spin labels for biomedical applications**, *Advanced Functional Materials* *22*, 3691-3698. ([Link to pdf](#))
5. Siddiqua, A., Luo, Y., Meyer, V., Swanson, M. A., Yu, X., Wei, G., Zheng, J., Eaton, G. R., Ma, B., Nussinov, R., Eaton, S. S. and Margittai, M. (2012) **Conformational basis for asymmetric seeding barrier in filaments of three-and four-repeat tau**, *J. Am. Chem. Soc.* *134*, 10271-10278. ([Link to pdf](#))
4. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. (2011) **Electron transfer flavoprotein domain II orientation monitored using double electron-electron resonance between an enzymatically reduced, native FAD cofactor and spin labels**, *Protein Science* *20*, 610-620. ([Link to pdf](#))
3. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. (2009) **DEER distance measurement between a spin label and a native FAD semiquinone in electron transfer flavoprotein**, *J. Am. Chem. Soc.* *131*, 15978-15979. ([Link to pdf](#))
2. Swanson, M. A., Usselman, R. J., Frerman, F. E., Eaton, G. R. and Eaton, S. S. (2008) **The iron-sulfur cluster of electron transfer flavoprotein-ubiquinone oxidoreductase is the electron acceptor for electron transfer flavoprotein**, *Biochemistry* *47*, 8894-8901. ([Link to pdf](#))
1. Detamore, M. S., Swanson, M. A., Frender, K. R. and Hrenya, C. M. (2001) **A kinetic-theory analysis of the scale-up of circulating fluidized beds**, *Powder Technology* *116*, 190-203. ([Link to pdf](#))

BOOK CHAPTERS:

1. Van Hove, J. L. K., Coughlin II, C. R., Swanson, M. A. and Hennermann, J. **Glycine Encephalopathy**. In: Adam M. P., editor. GeneReviews. Seattle, WA: University of Washington; 2018. In Press.

PUBLISHED MEETING ABSTRACTS:

6. Swanson, M. A., Rodriguez, L., Jiang, H., Knight, K., Friederich, M., Greene, N., Johnson, L., MacLean, K. and Van Hove, J. L. K. (2018) **Characterization of a new nonketotic hyperglycinemia mouse model with an unstable missense mutation in GLDC**, *Molecular Genetics and Metabolism* *123*, 210-211.
5. Coughlin II, C. R., Swanson, M. A., Spector, E., Meeks, N.J., Kronquist, K., Tsai, B.P., Storm, S.P., Gao, H.L., Nagy, P., Hyland, K., van Dooren, S.J.M., Salomons, G.S. and Van Hove, J. L. K. (2018) **The genotypic spectrum of ALDH7A1 mutations resulting in pyridoxine dependant epilepsy**, *Molecular Genetics and Metabolism* *123*, 224.

4. Coughlin II, C. R., Swanson, M. A., Kronquist, K., Acquaviva, C., Hutchin, T., Rodríguez-Pombo, P., Väisänen, M- L., Spector, E., Creadon-Swindel, G., Brás-Goldberg, A. M., Rahikkala, E., Moilanen, J. S., Mahieu, V., Matthijs, G., Bravo-Alonso, I., Pérez-Cerdá, C., Ugarte, M., Vinaey-Saban, C., Scharer, G. H. and Van Hove, J. L. K. (2016) **The genotypic spectrum of classic nonketotic hyperglycinemia due to mutations in GLDC and AMT**, *Molecular Genetics and Metabolism* 117, 236.
3. Van Hove, J. L., Swanson, M. A., Coughlin , C. R., Szerlong, H., Bjoraker, K., Spector, E., Scharer, G., Creadon-Swindel, G., Suhong, T., Mahieu, V., Matthijs, G. and Hennermann, J. (2014) **Outcome in nonketotic hyperglycinemia (NKH)**, *Annals of Neurology* 76, S178-S179.
2. Van Hove, J. L., Swanson, M. A., Coughlin , C. R., Bjoraker, K., Spector, E., Scharer, G., Creadon-Swindel, G., Mahieu, V., Matthijs, G. and Hennermann, J. (2014) **Outcome in nonketotic hyperglycinemia**, *Molecular Genetics and Metabolism* 111, 238-239. ([Link to pdf](#))
1. Aggarwal, P., Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. (2011) **Orientation of electron transfer flavoprotein domain II monitored using Q-band double electron-electron resonance**, *Abstracts of Papers of The American Chemical Society* 242, 120-BIOL.

PRESENTED WORK

INVITED TALKS (Speaker):

5. Swanson, M. A. and Van Hove, J. L. K. (2022) **"Amino Acid Levels in Brains of NKH Patients Measured by HPLC"** 2022 NKH Virtual Conference (April 2nd, 2022)
4. Swanson, M. A., Rodriguez, L., Jiang, H., Knight, K., Friederich, M., Greene, N., Johnson, L., MacLean, K. and Van Hove, J. L. K. (2018) **"Characterization of a new nonketotic hyperglycinemia mouse model with an unstable missense mutation in GLDC"** 2018 Annual Meeting of The Society for Inherited Metabolic Disorders (March 12th, 2018).
3. Swanson, M. A., Bjoraker, K., Szerlong, H. J., Tan, E. S., Christodoulou, J., Ferguson, M. A., Dyack, S., Collard, R., Friederich, M. W. and Van Hove, J. L. K. **"A Sibling Study in Attenuated Non-ketotic Hyperglycinemia Provides Direct Evidence of Therapeutic Treatment Effect of Benzoate and Dextromethorphan on Neurocognitive Outcome"** 2013 International Congress on Inborn Errors of Metabolism, Barcelona, Spain (September 4th, 2013).
2. Swanson, M. A., Kathirvelu, V., Meyer, V., Siddiqua, A., Majtan, T., Frerman, F. E., Margittai, M., Eaton, G. R. and Eaton, S. S. **"Double Electron-Electron Resonance (DEER): Patching the Holes in the Inner Tube of Structural Biology"** National Renewable Energy Laboratory, Golden, CO (July 16th, 2013).
1. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **"Orientation of Electron Transfer Flavoprotein Domain II Monitored Using Double Electron-Electron Resonance"** Bend Research Inc., Bend, OR (August 29th 2012).

INVITED TALKS (Co-Author):

5. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“DEER Distance Measurements Between a Spin Label and a Native FAD Semiquinone in Electron Transfer Flavoprotein,”** 8th International Workshop on EPR in Biology and Medicine, Krakow, Poland (October 2010).
4. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“DEER Distance Measurements Between a Spin Label and a Native FAD Semiquinone in Electron Transfer Flavoprotein,”** 52nd Rocky Mountain Conference on Analytical Chemistry, Snowmass, CO (August 2010).
3. Swanson, M. A., Usselman, R. J., Fielding, A. J., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“Impact of Mutations on ETF-QO,”** EPR2010, San Juan, Puerto Rico (May 2010).
2. Swanson, M. A., Detamore, M. and Hrenya, C. **“Effects of Particle Collisions on the Scaling of Fluidized Systems,”** Third Israeli Conference for Conveying and Handling of Particulate Solids, Dead Sea, Israel (May 2000).
1. Detamore, M., Frender, K., Swanson, M. A. and Hrenya, C. **“Scale-Up of High-Velocity Gas-Solid Systems: A Comparison between Kinetic-Theory Modeling and Existing Scaling Laws,”** Annual Meeting of the American Institute of Chemical Engineers, Dallas, TX (Nov 1999).

ORAL PRESENTATIONS (Graduate School):

4. Swanson, M. A. **“Conformational Flexibility of Electron Transfer Flavoprotein,”** Doctoral Defense, University of Denver, Denver, CO (May 2010).
3. Swanson, M. A. **“Better Off Dead: The Promising Anti-Cancer Molecule Cephalostatin 1,”** Departmental Seminar, University of Denver, Denver, CO (April 2010).
2. Swanson, M. A. **“Transfer Properties of Mitochondrial Carrier Proteins as Studied by Exchange Assays and Temperature-Jump Fluorescence Spectroscopy,”** Proposition Oral Exam Presentation, University of Denver, Denver, CO (June 2007).
1. Swanson, M. A. **“Effects of Metals on Iso-1-Cytochrome c NH5A Fragmentation,”** Interterm Project Presentation, University of Denver, Denver, CO (January 2006).

POSTER PRESENTATIONS:

14. Arribas, L., Swanson, M. A., Østergaard, E., Dallabona, C., Tsiakas, K., Hempel, M., Aquaviva-Bourdain, C., Farris, J., Stence, N., Magistrati, M., Koutsoukos, S., Spector, E. B., Kronquist, K., Christensen, M., Karstensen, H. G., Feichtinger, R., Achleitner, M., Merritt II, J. L., Perez, B., Ugarte, M., Grünewald, S., Riela, A. R., Julve, N., Arnoux, J., Mayr, J., Haldar, K., Santer, R., Lund, A., Donnini, C., Rodriguez-Pombo, P. and Van Hove, J. L. K. **“Pathogenic Variants in GCSH Encoding the H-Protein Cause a Variant Form of Nonketotic Hyperglycinemia”** 2021 International Congress on Inborn Errors of Metabolism, Barcelona, Spain (Nov. 21, 2021).

13. Swanson, M. A., Rodriguez, L., Jiang, H., Knight, K., Friederich, M., Greene, N., Johnson, L., MacLean, K. and Van Hove, J. L. K. (2018) **Characterization of a new nonketotic hyperglycinemia mouse model with an unstable missense mutation in GLDC**, 2018 Annual Meeting of The Society for Inherited Metabolic Disorders (March 11-14, 2018).
12. Rodriguez, L., Jiang, H., Swanson, M. A. and Van Hove, J. L. K. **“Biochemical Characterization of the A394V Nonketotic Hyperglycinemia Mouse Model”**, BIOL3939 Internship Presentation, University of Colorado, Denver (July 2017).
11. Aslamy, M., Coughlin II, C. R., Wempe, M. F., Van Hove, J. L. K. and Swanson M. A. **“Pyridoxine Dependent Epilepsy: Computational Genetic and Biochemical Studies to Estimate Incidence”**, BIOL3939 Internship Presentation, University of Colorado, Denver (July 2017).
10. Swanson, M. A., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“The Iron-Sulfur Cluster of Electron Transfer Flavoprotein-Ubiquinone Oxidoreductase (ETF-QO) is the Electron Acceptor for Electron Transfer Flavoprotein”**, EPR Shared Resource Symposium, University of Colorado, Denver, Anschutz Medical Campus (November 2016).
9. Swanson, M. A., Mitchell, D. G., Wang, Y., Paletta, J. T., Olankitwanit, A., Eaton, S. S., Eaton, G. R. and Rajca, A. **“Tumbling Correlation Time Measurements of Spin-Labeled PPI-PEG-Dendrimers”**, Poster Session, 54th Rocky Mountain Conference on Analytical Chemistry, Copper Mountain, CO (July 2012).
8. Meyer, V., Siddiqua, A., Swanson, M. A., Eaton, G. R., Eaton, S. S. and Margittai, M. **“Double Electron-Electron Resonance Spectroscopy Reveals Molecular Basis for Seeding Barrier Between Three- and Four-Repeat Tau”**, Poster Session, 54th Rocky Mountain Conference on Analytical Chemistry, Copper Mountain, CO (July 2012).
7. Meyer, V., Siddiqua, A., Swanson, M. A., Eaton, G. R., Eaton, S. S. and Margittai, M. **“Double Electron-Electron Resonance Spectroscopy Reveals Molecular Basis for Seeding Barrier Between Three- and Four-Repeat Tau”**, Poster Session, 2nd University of Denver Molecular and Cellular Biophysics Symposium (April 2012).
6. Aggarwal, P., Swanson, M. A., Kathirvelu, V., Eaton, G. R., Eaton, S. S., Majtan, T. and Frerman, F. E. **“Orientation of Electron Transfer Flavoprotein Domain II Monitored Using Q-band Double Electron-Electron Resonance”**, Biochemical Division Poster Session, ACS National Meeting, Denver, CO (August 2011).
5. Siddiqua, A., Swanson, M. A., Eaton, G. R., Eaton, S. S. and Margittai, M. **“Tau Fibril Conformation Probed by Double Electron-Electron Resonance at Q-Band”**, Poster Session, 53rd Rocky Mountain Conference on Analytical Chemistry, Snowmass, CO (July 2011).
4. Swanson, M. A., Kathirvelu, V., Majtan, T., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“Conformational Flexibility of Electron Transfer Flavoprotein Probed Using DEER Measurements of Distances Between Spin Labels and a Native FAD Semiquinone”**, Poster Session, 1st University of Denver Molecular and Cellular Biophysics Symposium (April 2011).
3. Swanson, M. A., Kathirvelu, V., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **“Conformational Flexibility of Electron Transfer Flavoprotein Probed Using DEER Measurements of**

Distances Between Spin Labels and a Native FAD Semiquinone", Poster Session, 52nd Rocky Mountain Conference on Analytical Chemistry, Snowmass, CO (August 2010).

2. Swanson, M. A., Kathirvelu, V., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **"DEER Distance Measurement Between a Spin Label and a Native FAD Semiquinone in Electron Transfer Flavoprotein"**, Poster Session, 51st Rocky Mountain Conference on Analytical Chemistry, Snowmass, CO (July 2009).
1. Swanson, M. A., Frerman, F. E., Eaton, G. R. and Eaton, S. S. **"The Iron-Sulfur Cluster of Electron Transfer Flavoprotein-Ubiquinone Oxidoreductase (ETF-QO) is the Electron Acceptor for Electron Transfer Flavoprotein"**, Poster Session, 50th Rocky Mountain Conference on Analytical Chemistry, Breckenridge, CO (July 2008).

FUNDING (Principle Investigator)

- | | |
|-------------|---|
| 7/20 – 6/21 | \$32,152 – North American Mitochondrial Disease Consortium (NAMDC), Pilot
<i>One carbon metabolism in human mitochondrial disorders: single mtDNA deletion syndromes</i>
Swanson (PI) |
| 3/17 - 6/18 | \$20,000 – Colorado Clinical and Translational Sciences Institute (CCTSI), Pilot
<i>Development of Effective Treatments for NKH Based on the Stabilization of the Glycine Cleavage Enzyme System P-Protein</i>
Swanson (PI) |

FUNDING (Key Personnel/Co-Author)

- | | |
|-------------|---|
| 3/14 - 3/15 | \$34,000 - National Organization for Rare Disorders (NORD), Seed Grant
<i>Variant Nonketotic Hyperglycinemia: Genetic Diagnosis to Curative Treatment</i>
Van Hove (PI) |
|-------------|---|

AWARDS

- | | |
|------|--|
| 2018 | SIMD Travel Award (\$1,000), SIMD Annual Meeting |
| 2014 | Denver Post Strength in Healthcare Award nominee |
| 2013 | SIMD Travel Award (\$2,000), International Congress of Inborn Errors of Metabolism |
| 2011 | Young Invest. Travel Grant (\$500), IX th European Symposium of the Protein Society |
| 2007 | Alfred C. Nelson Scholarship (\$5,000), University of Denver |

PROFESSIONAL AFFILIATIONS

American Society of Human Genetics (2015 - 2016)
Colorado Clinical & Translational Sciences Institute (CCTSI) (2014 – Present)
American Chemical Society (2011 – 2012; 2026 – Present)
International EPR Society (2011 - 2013)
Protein Society (2010 – 2011)

PATENTS

COMPOSITIONS AND METHODS FOR TREATING HOMOCYSTINURIA AND OTHER CONDITIONS

Inventors: Kenneth N. Maclean, Johan Van Hove, Hua Jiang and Michael A. Swanson

Australia: 2020272040 – Grant Date: March 14, 2024

Canada: PCT/US2020/027721 – Pending (Filed: April 10, 2020)

United States: 17/497,539 – Pending (Filed: October 8, 2021)

Europe: 20788082.4 – Pending (Filed: November 2, 2021)

RESEARCH

Senior Instructor (February 2015 – August 2025)

VAN HOVE LABORATORY, University of Colorado, Health Science Center, Pediatrics Department

- Cloning, expression, purification and characterization of proteins involved in lipoic acid synthesis.
- Chaperone drug screening for unstable glycine decarboxylase (GLDC) mutants using differential scanning fluorimetry (DSF).
- HPLC analysis of metabolites from NKH mouse model tissues.
- Development of LC-MS/MS method to measure folate vitamers in tissues and plasma.

Postdoctoral Research Associate (August 2012 – January 2015)

VAN HOVE LABORATORY, University of Colorado, Health Science Center, Pediatrics Department

- Radionuclide enzyme activity measurements of clinical glycine cleavage pathway protein mutations associated with NKH (nonketotic hyperglycemia) via transient transfection of COS7 cells.
- Biochemical characterization (in-gel activity, cellular iron content, RT-qPCR) of iron-sulfur proteins in samples from patients with variant NKH.
- RT-qPCR analysis of patient samples to measure iron-sulfur biogenesis gene expression.
- Mammalian cell culture (COS7, HEPG2, patient fibroblasts, C17.2 neuronal stem cells).

Adjunct Faculty (September 2012 – Present)

University of Denver, Department of Chemistry and Biochemistry

- Instructed four sections of General Chemistry to a diverse group of 232 students.
- Instructed Biochemistry II (Membranes and Metabolism) and Biochemistry III (Nucleic Acids) to 66 undergraduate upper classmen and 10 graduate students.

Temporary Aide (February 2012 – July 2012)

FRERMAN LABORATORY, University of Colorado, Health Science Center, Pediatrics Department

- Clinical assay development.
- Bacterial expression and FPLC purification of mitochondrial enzymes.
- Organic and enzymatic synthesis and HPLC purification of acyl-CoA's.

Chemical Consultant (September 2011 – March 2012) CERTOL INTERNATIONAL

- Responsible for the validation of GC methods to quantify phenols, ethanol and isopropyl alcohol in FDA regulated medical disinfectant products following USP-NF guidelines.
- Tested QA/QC of products for medical, dental and industrial applications. Authored validation reports and lab SOP's to reflect changes made in testing methods.

Postdoctoral Research Associate (June 2010 – September 2011)

EATON LABORATORY, University of Denver, Department of Chemistry and Biochemistry

- Rotational correlation time determination of spin-labeled dendrimers to assess their effectiveness as possible MRI contrast agents (collaboration with Prof. A. Rajca, U. Nebraska).
- EPR power saturation measurements of nitroxyl radicals inside carbon nanotubes, a promising new class of MRI and EPRI contrast agents (with Prof. Lon J. Wilson, Rice University).
- Development of organic and inorganic standards for use in EPR radiation dosimetry instrument (collaboration with GE Healthcare and Prof. H. Swartz, Dartmouth).
- Performed double electron-electron resonance (DEER) measurements of truncated tau constructs to gain information about tau's conformation in filaments (with Prof. M. Margittai, U. Denver).
- Molecular dynamics (MD) simulations of the motion of methanethiosulfonate (MTSL) spin labels attached to proteins.

Graduate Research Assistant (September 2006 – June 2010)

EATON LABORATORY, University of Denver, Department of Chemistry and Biochemistry

- Confirmed electron transfer pathway through electron-transferring-flavoprotein dehydrogenase (ETF-QO) using mutagenesis and potentiometric titrations probed by EPR spectroscopy.
- Determined domain orientation in electron transferring flavoprotein (ETF) using DEER to measure distances between artificially added spin labels and the enzymatically reduced FAD.
- Expressed protein in microbial (*E. coli*) and mammalian expression systems. Purified using FPLC with ion-exchange, hydrophobic interaction, affinity and size exclusion chromatography columns.
- Synthesized antimicrobial peptide variants for membrane depth immersion measurements. Purified using HPLC and LC-MS (collaboration with Prof. R. Hodges, U. Colorado at Denver).

Graduate Research Assistant (September 2005 – September 2006)

BOWLER LABORATORY, University of Denver, Department of Chemistry and Biochemistry

- Investigation of protein folding interactions in denatured states of cytochrome *c'* mutants.

Technician (April 2005 – September 2005) AMGEN, Longmont, CO

- Part of a team responsible for washing and sterilizing all non clean-in-place equipment.
- Worked in cGMP environment keeping detailed records of all equipment washed and autoclaved following strict regulations.

Research Technician (February 2003 – April 2005) ELTRON RESEARCH INC, Boulder, CO

- Designed and built a bench scale and a \$7000 portable pilot scale electrolytic cell reactor for the production of H₂O₂ based reverse osmosis membrane cleaning solutions.
- Developed an interface for computerized control of reactor.

Undergraduate Research Assistant (May 1999 – August 2000)

HYRENA LABORATORY, University of Colorado, Department of Chemical Engineering

- Computer simulations of scale-up in fluidized bed reactors using UNIX based program.