



BINGHAMTON UNIVERSITY

SCHOOL OF PHARMACY AND
PHARMACEUTICAL SCIENCES





SCHOOL OF PHARMACY AND PHARMACEUTICAL SCIENCES

The first new professional school at Binghamton University in more than a decade, the School of Pharmacy and Pharmaceutical Sciences (SOPPS) is rapidly establishing itself as a research-focused, innovative school on the cutting edge of pharmacy education. We are making strides in drug discovery, drug device development, pharmaceuticals, pharmacology and pharmacogenomics, even as we are educating our next generations of pharmacists.





This 2017–2018 annual report is a comprehensive account detailing the achievements of our 20 faculty in their respected fields. We are proud to showcase our growth in publications and presentations for the period of June 1, 2017 to May 31, 2018, and Sponsored Program Awards for the period of July 1, 2017 to June 30, 2018.

Our presentations

Aaron Beedle, PhD

Poster presentation: “Abnormal dystroglycan glycosylation causes defects in skeletal muscle regeneration.” Gordon Research Conference on Myogenesis, Renaissance Tuscany Il Ciocco, Lucca (Barga) Italy.

Invited speaker: “Mechanistic and therapeutic advances in dystroglycan glycosylation-deficient muscular dystrophy.” Invited research seminar. Concordia University, Department of Biology seminar series, Montreal, Canada.

Conference presentation: “Is mTORC1 a therapeutic target for dystroglycanopathy-type muscular dystrophies?” Muscle Membrane Serendipity: Past, Present & Future Conference, University of Iowa, Iowa City, Iowa.

Poster presentation: Binghamton Biomedical Research Conference, Binghamton University, Binghamton, N.Y.

KarenBeth Bohan, PharmD

Speaker: “Antimicrobial Stewardship: Practical Approaches to Support Optimal Antibiotic Use.” Medical Staff, Lourdes Hospital, Binghamton, N.Y.

Tracy Brooks, PhD

Speaker: Wilmot Cancer Institute, University of Rochester, Rochester, N.Y.

Speaker: Center for Nucleic Acid Research, Carnegie Mellon University, Pittsburgh, Pa.

Poster Presentation: “Targeted downregulation of MYC through G-quadruplex

stabilization: a novel therapeutic approach for breast cancer and lymphoma.” American Society for Pharmacology and Experimental Therapeutics (ASPET), San Diego, Calif.

Poster presentation: “Therapeutic validation of single- and double-anti-MYC and anti-KRAS approaches for the treatment of Ovarian Cancer.” American Society for Pharmacology and Experimental Therapeutics (ASPET), San Diego, Calif.

Thesis committee member/examiner: Dennis Carty, University of Mississippi, Mississippi State, Miss.

Thesis committee member/examiner: Trisha Drawn, University of Mississippi, Mississippi State, Miss.



Leon Cosler, PhD

Poster presentation: “Opioids for Dental Care in Hospital Emergency Departments: Patient Profiles, Predictive Models and Policy Recommendations.” American Public Health Association Annual Meeting, Atlanta, Ga.

Poster presentation: “Factors Influencing Emergency Health Care Providers to

Prescribe Opioids for Dental-related conditions in Emergency Departments.” Binghamton University Graduate Research Poster Competition (Honorable Mention), Binghamton, N.Y.

Invited speaker: “Healthcare Data Analysis: Challenges and Opportunities.” Invited Data Salon presented to Data Science Transdisciplinary Working Group and invited faculty, Binghamton, N.Y.

Invited speaker: “The Outlook(s) for Pharmacy.” Binghamton University Pre-Pharmacy Association, Binghamton, N.Y.

Conference panel participant: “Private Insurance Business and Information Systems.” Binghamton Symposium on Health Care Management and Policy, Binghamton, N.Y.

Utkarsh Dang, PhD

Speaker: “Clustering and Classification using Skew Power Exponential Distributions.” Statistical Society of Canada, Montreal, Canada.

Poster presentation: “Defining Area Under The Concentration-Time Curve Thresholds For Vancomycin Efficacy And Nephrotoxicity: A Practical Approach Using Two-Point Pharmacokinetics In Methicillin-Resistant Staphylococcus Aureus Bacteremia.” Making a Difference in Infectious Diseases (MAD-ID) Conference, Orlando, Fla.

Invited speaker: “Defining Area Under the Concentration-Time Curve Thresholds For Vancomycin Efficacy And Nephrotoxicity: A Practical Approach Using Two- Point Pharmacokinetics In Methicillin-Resistant

Staphylococcus Aureus Bacteremia.”
New York State Council of Health-system
Pharmacists Annual Assembly, Saratoga, N.Y.

Invited speaker: “Phylogenetic comparative
methods for modeling discrete character
evolution using incomplete data,” University
of Guelph, Canada.

Anthony Di Pasqua, PhD

Speaker: “Holmium for use in cancer therapy.”
VARSKIN Technical Meeting, U.S. Nuclear
Regulatory Commission Headquarters,
Rockville, Md.



William Eggleston, PharmD

Speaker: “Synthetic Drugs of Abuse in the
Inpatient Setting.” 1.0 CEU, SUNY Upstate
Community Campus, Grand Rounds,
Syracuse, N.Y.

Speaker: “Inpatient Management of Alcohol
Withdrawal.” 1.0 CEU, Lourdes Hospital, Grand
Rounds, Binghamton, N.Y.

Speaker: “A Review of Drugs of Abuse for
the EMS Provider.” 3.0 CEUs, Broome County
Health Department, Binghamton, N.Y.

Speaker: “Emerging Drug Threats.” 1.0 CEU,
Pharmacists Society of the State of New York
Midwinter Meeting, Albany, N.Y.

Speaker: “Synthetic Opioids.” 1.0 CEU,
Onondaga County Medical Examiner’s
Combined Conference, Syracuse, N.Y.

Speaker: “Schreffler S. Pre-Hospital Care of
the Poisoned Patient.” 1.0 CEU, Upstate New
York Poison Center 21st Annual Toxicology
Teaching Day, Syracuse, N.Y.

Speaker: “America’s Opioid Epidemic: The
Role of the Pharmacist in Reducing Addiction
and Overdose Deaths.” 2.0 CEUs, Pharmacists
Association of the Southern Tier, Johnson
City, N.Y.

Speaker: “Synthetic Drug Review.” Chronic
Pain and Addiction Medicine Student Interest
Group, SUNY Upstate Medical University,
Syracuse, N.Y.

Invited speaker: “Heavy Metal Toxicity.”
Core content lecture, University at Buffalo
Emergency Medicine Residency Program,
Buffalo, N.Y.

Invited speaker: “Household Toxins.” Core
content lecture, University at Buffalo
Emergency Medicine Residency Program,
Buffalo, N.Y.

Speaker: “Pediatric Exposures in the 21st
Century.” Le Moyne College Physician
Assistant Program, Syracuse, N.Y.

Speaker: “Legal Highs.” UHS Medicine
Residency Program, Johnson City, N.Y.

Speaker: “Identifying Illicit Drug Toxicity in
the Emergency Department.” Emergency
Medicine Medical Student Interest Group,
SUNY Upstate Medical University, Syracuse,
N.Y.

Speaker: “Inpatient Management of Alcohol
Withdrawal.” Grand Rounds, Lourdes Hospital,
Binghamton, N.Y.

Speaker: “Approach to the Acidosis Patient.”
Core content lecture, University at Buffalo
Emergency Medicine Residency Program,
Buffalo, N.Y.

Invited speaker: “Poison Center Overview
and Epidemiology.” Core content lecture.
University at Buffalo Emergency Medicine
Residency Program, Buffalo, N.Y.

Speaker: “Spencer S. Precepting Pearls.”
Faculty and Resident Development Session,
Binghamton University, Binghamton, N.Y.

Invited speaker: “Cardiac Toxins.” Core
content lecture, SUNY Upstate Emergency
Medicine Residency Program, Syracuse, N.Y.

Speaker: “Toxicology Board Review.”
Emergency Medicine Residency Program,
SUNY Upstate Medical University, Department
of Emergency Medicine, Syracuse, N.Y.
(ongoing)

Speaker: “Approach to the Patient with
Acidosis.” Acting intern Emergency Medicine
rotation, SUNY Upstate Medical University,
Department of Emergency Medicine,
Syracuse, N.Y. (ongoing)

Speaker: “Opioids in America.” Toxicology
experiential rotation lecture, Upstate New
York Poison Center, Syracuse, N.Y.



Yetrib Hathout, PhD

Invited speaker: “Biomarkers associated with inflammation and connective tissue remodeling in DMD.” Workshop organized by National Institutes of Health and Parent Project Muscular Dystrophy, Shirely Ryan Ability Lab, Chicago, Ill.

Poster presentation: “Clinical Validation of Serum Protein Biomarkers in Duchenne Muscular Dystrophy.” All-School Retreat, School of Pharmacy Binghamton University, Binghamton, N.Y.

Invited speaker: “Development and Implementation of Pharmacodynamic Biomarkers in Duchenne Muscular Dystrophy.” Biomedical Department, Binghamton University, Binghamton, N.Y.

Invited speaker: “Targeted quantification

of Dystrophin by mass spectrometry and comparison to antibody based assays.” Dystrophin Mass Spectrometry Assay Workshop organized by Algorithm and NSP, Laval, Canada.

Invited speaker: “Biomarkers/Omics in Duchenne muscular Dystrophy.” Precision Medicine and Muscular Dystrophy Workshop. Veterinary Medicine Complex, University of California, Davis, Calif.

Eric Hoffman, PhD

Invited speaker: “Development of a better glucocorticoid: Vamorolone and the venture philanthropy space.” Upstate Medical Center, Syracuse, N.Y.

Conference presentation: Trial Update: Vamorolone. Parent Project Muscular Dystrophy (PPMD) international conference. Chicago, Ill.

Conference presentation: Neuromuscular Research Conference. Berlin, Germany.

Invited speaker: National Institutes of Neurology and Psychiatry. Kodaira, Tokyo Japan.

Conference presentation: PPMD meeting. Rome, Italy.

Keynote lecture: Ottawa Neuromuscular Conference. Ottawa, Canada.

Conference presentation: TREAT-NMD Conference. Freiburg, Germany.

Invited speaker: University of Texas Southwestern Pediatric Grand Rounds. Dallas, Texas.

Conference presentation: Biomarker conference, University College London, London, UK.

Wesley Kufel, PharmD

Poster presentation: “Implementation of a Two-Point Pharmacokinetic AUC-based Vancomycin Therapeutic Drug Monitoring Approach in Patients with Methicillin-Resistant Staphylococcus aureus Bacteremia.” Making a Difference in Infectious Diseases Conference, Orlando, Fla.

Poster presentation: “Antimicrobial Stewardship Education Among United States Colleges and Schools of Pharmacy.” American College of Clinical Pharmacy National Meeting, Phoenix, Ariz.

Poster presentation: “Adverse Drug Reactions Among Patients Enrolled in an Outpatient Parenteral Antimicrobial Therapy (OPAT) Program 2015-2016 at UNC Medical Center.” IDWeek 2017, San Diego, Calif.

Poster presentation: “Pro Con Debate: Polymyxin B versus Colistin.” ACPE-accredited New York State Council of Health-System Pharmacists Annual Assembly, Saratoga Springs, N.Y.

Poster presentation: “A Time for Change? Clostridium difficile Stewardship and Management Updates.” ACPE-accredited Southern Tier Chapter of the New York State Council of Health-System Pharmacists Meeting, Binghamton, N.Y.

Poster presentation: “The Bad Bugs are Here! An Update on the Management of Multidrug

Resistant Gram-Negative Bacterial Infections.” ACPE-Accredited New York State American College of Clinical Pharmacy Annual Meeting, Syracuse, N.Y.

Poster presentation: “Characterization of Readmissions Among Patients Enrolled in an Outpatient Parenteral Antimicrobial Therapy (OPAT) Program Over a 2-Year Period at UNC Medical Center.” IDWeek 2017, San Diego, Calif.



Sarah Lynch, PharmD

Invited presentation: “Updates in Late breaking Literature, Women’s Health: Aspirin in Preterm Preeclampsia.” Platform presentation, American College of Clinical Pharmacy Annual Meeting, 0.15 CEUs, Phoenix, Ariz.

Invited presentation: “Seizing the Opportunity: Preparing Pharmacists for Contraceptive Prescribing.” Roundtable presentation, Minnesota Pharmacists Association

Pharmaceutical Care Lyceum, Hackensack, Mn.

Invited Speaker: “Reducing the Controls on Birth Control: Will Women Get the Care They Need?” American Pharmacists Association Hot Topics Webinar Series, 0.1 CEU.

Invited Speaker: “Medication Management.” Hillside Senior Living Center, Binghamton, N.Y.

Kanneboyina Nagaraju, PhD

Invited speaker: “Inflammation and immune response in muscle diseases. School of Human Sciences, University of Western Australia, Perth, Australia.

Speaker: “The role of Harakiri, a mitochondrial apoptosis mediator, in maintaining membrane stability, muscle inflammation and weakness in myositis.” 14th International Congress of Neuroimmunology, Brisbane, Australia.

Speaker and thesis examiner: “Potential therapies and biomarkers for LAMA2-CMD: does the microRNA hype deliver?” Faculty of Medicine, Lund University, Sweden.

Invited speaker: “Pathogenesis of idiopathic inflammatory myopathies.” Centre for Muscle Research, Department of Physiology, School of Biomedical Sciences, The University of Melbourne, Melbourne, Australia.

Invited speaker: “Grand rounds, Drug development & approval of therapies for rare & progressive disorders (with a focus on Duchenne Muscular Dystrophy).” Children’s Health Queensland Hospital and Health Service, Lady Cilento Children’s Hospital, Brisbane, Australia.

Invited speaker: “Myositis patient group meeting on safety and efficacy glucocorticoids and their analogues.” SW Florida Keep in touch group, Myositis patient group, Fla.

Invited speaker: Translational Research Workshop. European Neuromuscular Center Symposium, Vienna, Austria.

Invited speaker: “Update of RNA-based NMD therapies.” International Congress on Neuromuscular Diseases, Vienna, Austria.

Invited speaker: Medical Conference for medical community on JM pathogenesis and Pathophysiology, George Washington University School of Medicine, Washington DC.

Invited speaker: “Glucocorticoid analogues.” CureJM Family Conference General Session, Alexandria, Va.

Panelist: “Drug discovery for JM.” Family Conference General Session, Alexandria, Va.

Erin Pauling, PharmD

Speaker: “The Skinny on Weight Loss: An Overview of Pharmacological Obesity Management Continuing Medical Education program.” Lourdes Hospital, Binghamton, N.Y.

Speaker: “The Skinny on Weight Loss: A Review of Pharmacological Obesity Management Continuing Pharmacy Education program.” American Pharmacists Association (APhA) Diabetes Management Special Interest Group (SIG).

Speaker: “PharmD Accreditation Standards and Additional Tools” presentation given to pharmacists, preceptors and residents as part of the Department of Pharmacy Practice Resident/Faculty Development series, Binghamton, N.Y.

Speaker: “PharmD Accreditation Standards and Additional Tools.” Resident/faculty development session, Binghamton, N.Y.

Gail Rattinger, PharmD, PhD

Invited speaker: “Using Social Determinants of Health to Create a Culture of Interprofessional Education.” National Academies of Practice (NAP) 2018 Annual Meeting and Forum, Atlanta, Ga.

Poster presentation: “Antidementia Medication Use is Associated with Decreased Informal Costs in Mild Dementia.” 21st International Association of Gerontology and Geriatrics (IAGG) World Congress of Gerontology and Geriatrics, San Francisco, Calif.

Poster presentation: “Caregiver-Care Recipient Relationships Are Associated with Neuropsychiatric Symptoms in Dementia.” 21st International Association of Gerontology and Geriatrics (IAGG) World Congress of Gerontology and Geriatrics, San Francisco, Calif.

Angela Riley, PharmD

Poster presentation: “Medication Management.” Stepping On Program, Good Shepherd Villages, Endwell, N.Y.

Sara Spencer, PharmD

Speaker: “ASIPP Guideline 2017: Responsible, Safe and Effective Prescription of Opioids for Chronic Non-Cancer Pain.” 0.25 CEUs; The Collaborative Education Institute (CEI) Guideline Update Series (webinar).

Nathan Tumey, PhD

Invited speaker: “Dreaming Big and Thinking Small: Medicinal Chemistry Strategies for the Optimization of Antibody Drug Conjugates.” Binghamton University, Biomedical Engineering Department, Binghamton, N.Y.

Invited speaker: “Dreaming Big and Thinking Small: Medicinal Chemistry Strategies for the Optimization of Antibody Drug Conjugates.” University of Buffalo, School of Pharmacy, Buffalo, N.Y.

Invited speaker: “Macromolecular Medicinal Chemistry.” Binghamton University School of Pharmacy and Pharmaceutical Sciences, Binghamton, N.Y.

Invited speaker: “Macromolecular Medicinal Chemistry.” Binghamton University, Department of Chemistry, Binghamton, N.Y.

Invited speaker: “Macromolecular Medicinal Chemistry.” Takeda Pharmaceutical Company, Mendon, N.Y.





Our publications

Anderson J, Seol H, Gordish-Dressman H, **Hathout Y**, Spurney CF; CINRG Investigators. Interleukin 1 Receptor-Like 1 Protein (ST2) is a Potential Biomarker for Cardiomyopathy in Duchenne Muscular Dystrophy. *Pediatr Cardiol*. 2017 Dec;38(8):1606-1612. doi: 10.1007/s00246-017-1703-9. Epub 2017 Aug 18. PubMed PMID: 28821969.

Behrens S, **Rattinger GB**, Schwartz S, Matyi J, Sanders C, DeBerard MS, Lyketsos CG, Tschanz JT. Use of FDA approved medications for Alzheimer's Disease in Mild Dementia is Associated with Reduced Informal Costs of Care. *International Psychogeriatrics*: 2018 Mar 21: 1-9. doi: 10.1017/S10416021800011X. PubMed PMID: 29559029.

Boehler JF, Hogarth MW, Barberio MD, Novak JS, Ghimbovschi S, Brown KJ, Alemo Munters L, Loell I, Chen YW, Gordish-Dressman H, Alexanderson H, Lundberg IE, **Nagaraju K**. Effect of endurance exercise on microRNAs in myositis skeletal muscle-A randomized controlled study. *PLoS One*. 2017 Aug 22;12(8):e0183292. PubMed PMID: 28829792.

Capogrosso RF, Mantuano P, Uaesoontrachoon K, Cozzoli A, Giustino A, Dow T, Srinivassane S, Filipovic M, Bell C, Vandermeulen J, Massari AM, De Bellis M, Conte E, Pierno S, Camerino GM, Liantonio A, **Nagaraju K**, De Luca A. Ryanodine channel complex stabilizer compound S48168/ARM210 as a disease modifier in dystrophin-deficient mdx mice: proof-of-concept study and independent validation of efficacy. *FASEB J*. 2018 Feb;32(2):1025-1043.

Conklin LS, Damsker JM, **Hoffman EP**, Jusko WJ, Mavroudis PD, Schwartz BD, Mengle-

Gaw LJ, Smith EC, Mah JK, Guglieri M, Nevo Y, Kuntz N, McDonald CM, Tulinius M, Ryan MM, Webster R, Castro D, Finkel RS, Smith AL, Morgenroth LP, Arrieta A, Shimony M, Jaros M, Shale P, McCall JM, **Hathout Y**, **Nagaraju K**, van den Anker J, Ward LM, Ahmet A, Cornish MR, Clemens PR. Phase IIa trial in Duchenne muscular dystrophy shows vamorolone is a first-in-class dissociative steroidal anti-inflammatory drug. *Pharmacol Res*. 2018 Sep 13;136:140-150.

Defour A, Medikayala S, Van der Meulen JH, Hogarth MW, Holdreith N, Malatras A, Duddy W, Boehler J, **Nagaraju K**, Jaiswal JK. Annexin A2 links poor myofiber repair with inflammation and adipogenic replacement of the injured muscle. *Hum Mol Genet*. 2017 Jun 1;26(11):1979-1991. doi: 10.1093/hmg/ddx065. PubMed PMID: 28334824; PubMed Central PMCID: PMC6075559.

Echigoya Y, Lim KRQ, Trieu N, Bao B, Miskew Nichols B, Vila MC, Novak JS, Hara Y, Lee J, Touznik A, Mamchaoui K, Aoki Y, Takeda S, **Nagaraju K**, Mouly V, Maruyama R, Duddy W, Yokota T. Quantitative Antisense Screening and Optimization for Exon 51 Skipping in Duchenne Muscular Dystrophy. *Mol Ther*. 2017 Jul 28. PubMed PMID: 28865998.

Eggleston W, Clemency BM. In response to: Do heroin overdose patients require observation after receiving naloxone? *Clin Toxicol (Phila)*. 2017 Apr;55(4):308. doi: 10.1080/15563650.2017.1284336. Epub 2017 Jan 31. PubMed PMID: 28140683.

Eggleston W, Marraffa JM, Nacca N. In response to: "Loperamide metabolite-induced cardiomyopathy and QTc prolongation". *Clin*

Toxicol (Phila). 2017 Nov;55(9):1023. doi: 10.1080/15563650.2017.1334917. Epub 2017 Jun 15. PubMed PMID: 28617054.

Erkizan HV, Johnson K, Ghimbovschi S, Karkera D, Trachiotis G, Adib H, **Hoffman EP**, Wadleigh RG. African-American esophageal squamous cell carcinoma expression profile reveals dysregulation of stress response and detox networks. *BMC Cancer*. 2017 Jun 19;17(1):426. doi: 10.1186/s12885-017-3423-1. PubMed PMID: 28629367; PubMed Central PMCID: PMC5477112.

Fiorillo AA, Tully CB, Damsker JM, **Nagaraju K**, **Hoffman EP**, Heier CR. Muscle miRNAome shows suppression of chronic inflammatory miRNAs with both prednisone and vamorolone. *Physiol Genomics*. 2018 Jun 8. doi:10.1152/physiolgenomics.00134.2017. PubMed PMID: 29883261.

Fonseca R, Abouzaid S, Bonafede M, Cai Q, Parikh K, **Cosler L**, Richardson P. Trends in overall survival and costs of multiple myeloma, 2000-2014. *Leukemia*. 2017 Sep;31(9):1915-1921. doi: 10.1038/leu.2016.380. Epub 2016 Dec 23. PubMed PMID: 28008176; PubMed Central PMCID: PMC5596206.

Fulton MD, Hanold LE, Ruan Z, Patel S, **Beedle AM**, Kannan N, Kennedy EJ. Conformationally constrained peptides target the allosteric kinase dimer interface and inhibit EGFR activation. *Bioorg Med Chem*. 2018 Mar 15;26(6):1167-1173. doi: 10.1016/j.bmc.2017.08.051. Epub 2017 Sep 5. PubMed PMID: 28911855; PubMed Central PMCID: PMC5837902.

Ghosh S, Loffredo CA, Mitra PS, Trnovec T, Palkovicova Murinova L, Sovcikova E, **Hoffman**

EP, Makambi KH, Dutta SK. PCB exposure and potential future cancer incidence in Slovak children: an assessment from molecular finger printing by Ingenuity Pathway Analysis (IPA®) derived from experimental and epidemiological investigations. *Environ Sci Pollut Res Int*. 2018 Jun;25(17):16493-16507. doi: 10.1007/s11356-017-0149-1. Epub 2017 Nov 15. PubMed PMID: 29143255; PubMed Central PMCID: PMC5953777.

Gordish-Dressman H, Willmann R, Pazze LD, Kreibich A, van Putten M, Heydemann A, Bogdanik L, Lutz C, Davies K, Demonbruen AR, Duan D, Elsey D, Fukada SI, Girgenrath M, Gonzalez JP, Grounds MD, Nichols A, Partridge T, Passini M, Sanarica F, Schnell FJ, Wells DJ, Yokota T, Young CS, Zhong Z, Spurney C, Spencer M, De Luca A, **Nagaraju K**, Aartsma-Rus A. "Of Mice and Measures": A Project to Improve How We Advance Duchenne Muscular Dystrophy Therapies to the Clinic First Workshop Report: Examining current findings and opportunities around the emerging D2.B10-Dmdmdx/J (D2/mdx) model in context of the classic C57BL/10ScSn-Dmdmdx/J (B10/mdx). *J Neuromuscul Dis*. 2018 Sep 3.

Hoffman EP, Riddle V, Siegler MA, Dickerson D, Backonja M, Kramer WG, **Nagaraju K**, Gordish-Dressman H, Damsker JM, McCall JM. Phase 1 trial of vamorolone, a first-in-class steroid, shows improvements in side effects via biomarkers bridged to clinical outcomes. *Steroids*. 2018 Jun;134:43-52. doi: 10.1016/j.steroids.2018.02.010. Epub 2018 Mar 8. PubMed PMID: 29524454; PubMed Central PMCID: PMC6136660.

Hoffman EP. Workshop Participants; TREAT-

NMD Alliance. Facilitating orphan drug development: Proceedings of the TREAT-NMD International Conference, December 2015, Washington, DC, USA. *Neuromuscul Disord*. 2017 Jul;27(7):693-701. doi: 10.1016/j.nmd.2017.02.013. Epub 2017 Mar 4. PubMed PMID: 28434909.

Jain HV, Boehler JF, **Nagaraju K**, Beaucage SL. Synthesis, Characterization, and Function of an RNA-Based Transfection Reagent. *Curr Protoc Nucleic Acid Chem*. 2018 Mar;72(1):4.81.1-4.81.29. doi: 10.1002/cpnc.51. PubMed PMID: 29927123; PubMed Central PMCID: PMC6020023.

Jain HV, Boehler JF, Verthelyi D, **Nagaraju K**, Beaucage SL. An amphipathic trans-acting phosphorothioate RNA element delivers an uncharged phosphorodiamidate morpholino sequence in mdx mouse myotubes. *RSC Adv*. 2017;7:42519-42528. doi: 10.1039/C7RA04247G. Epub 2017 Sep 4. PubMed PMID: 28989703; PubMed Central PMCID: PMC5625301.

Kufel WD, Armistead PM, Ptachcinski JR, Daniels LM, Alexander MD, Shaw JR. Drug-Drug Interaction Between Isavuconazole and Tacrolimus: Is Empiric Dose Adjustment Necessary? *J Pharm Pract*; 2018. [In Press].

Kufel WD, Devanathan AS, Marx AH, Weber DJ, Daniels LM. Bezlotoxumab: A Novel Agent for the Prevention of Recurrent Clostridium difficile Infection. *Pharmacotherapy*. 2017 Oct;37(10):1298-1308. doi: 10.1002/phar.1990. Epub 2017 Sep 12. Review. PubMed PMID: 28730660.

Kufel WD, Jeffres MN, MacDougall C, Cho JC, Marx AH, Williams DM. Antimicrobial

stewardship education in US colleges and schools of pharmacy. *J Antimicrob Chemother*. 2018 Aug 1;73(8):2252-2258. doi: 10.1093/jac/dky166. PubMed PMID: 29846603.

Lehmann DF, **Eggleston WD**, Wang D. Validation and clinical utility of the hERG IC50:Cmax ratio to determine the risk of drug-induced torsades de pointes: a meta-analysis. *Pharmacotherapy*. 2018; 38(3):341-8.

Lewis LS, Huffman KM, Smith IJ, Donahue MP, Slentz CA, Houmard JA, Hubal MJ, **Hoffman EP**, Hauser ER, Siegler IC, Kraus WE. Genetic Variation in Acid Ceramidase Predicts Non-completion of an Exercise Intervention. *Front Physiol*. 2018 Jun 29;9:781. doi: 10.3389/fphys.2018.00781. eCollection 2018. PubMed PMID: 30008672; PubMed Central PMCID: PMC6034073.

Lin VJT, Zolekar A, **Shi Y**, Koneru B, Dimitrijevic S, **Di Pasqua AJ**, Wang YC. Potassium as a pluripotency-associated element identified through inorganic element profiling in human pluripotent stem cells. *Sci Rep*. 2017 Jul 10;7(1):5005. doi: 10.1038/s41598-017-05117-2. PubMed PMID: 28694442; PubMed Central PMCID: PMC5504050.

Liu D, Morales FE, IglayRager HB, Treutelaar MK, Rothberg AE, Hubal MJ, Nadler EP, Robidoux J, Barakat H, Horowitz JF, **Hoffman EP**, Burant CF, Gordon PM. Expression of macrophage genes within skeletal muscle correlates inversely with adiposity and insulin resistance in humans. *Appl Physiol Nutr Metab*. 2018 Feb;43(2):187-193. doi: 10.1139/apnm-2017-0228. Epub 2017 Oct 16. PubMed PMID: 29035695.

Marsteller JA, HSU YJ, Gill C, Kiptanui Z,

Fakeye OA, Engineer LD, Perlmutter D, Khanna N, **Rattinger GB**, Nichols D, Harris, I. Maryland Multipayor Patient-centered Medical Home Program: A 4-Year Quasiexperimental Evaluation of Quality, Utilization, Patient Satisfaction, and Provider Perceptions. *Medical Care*: 2018 Apr; 56(4):308-320. doi: 10.1097/MLR. 0000000000000881. PubMed PMID: 29462077.

McClellan AK, Hao T, **Brooks TA** and Smith AE. "RAFT Polymerization for the Synthesis of Tertiary Amine-Based DiBlock Copolymer Nucleic Acid Delivery Vehicles". 2017 Dec; 17(12) *Macromolecular Bioscience*. PMID: 29139616

McDonald CM, Henricson EK, Abresch RT, Duong T, Joyce NC, Hu F, Clemens PR, **Hoffman EP**, Cnaan A, Gordish-Dressman H; CINRG Investigators. Long-term effects of glucocorticoids on function, quality of life, and survival in patients with Duchenne muscular dystrophy: a prospective cohort study. *Lancet*. 2018 Feb 3;391(10119):451-461. doi: 10.1016/S0140-6736(17)32160-8. Epub 2017 Nov 22. PubMed PMID: 29174484.

Mogle BT, Steele JM, Thomas SJ, **Bohan K, Kufel WD**. Clinical review of delafloxacin: a novel anionic fluoroquinolone. *J Antimicrob Chemother*. 2018 Jun 1;73(6):1439-1451. doi: 10.1093/jac/dkx543. PubMed PMID: 29425340.

Morgan RK, Molnar MM, Batra H, Summerford B, Wadkins RM, **Brooks TA**. Effects of 5-Hydroxymethylcytosine Epigenetic Modification on the Stability and Molecular Recognition of VEGF i-Motif and G-Quadruplex Structures. *J Nucleic Acids*. 2018 May 16;2018:9281286. doi:

10.1155/2018/9281286. eCollection 2018. PubMed PMID: 29862069; PubMed Central PMCID: PMC5976936.

Nadler EP, Robidoux J, Barakat H, Horowitz JF, **Hoffman EP**, Burant CF, Gordon PM. Expression of macrophage genes within skeletal muscle correlates inversely with adiposity and insulin resistance in humans. *Appl Physiol Nutr Metab*. 2018 Feb;43(2):187-193. doi: 10.1139/apnm-2017-0228. Epub 2017 Oct 16. PubMed PMID: 29035695.

Nghiem PP, Kornegay JN, Uaesoontrachoon K, Bello L, Yin Y, Kesari A, Mittal P, Schatzberg SJ, Many GM, Lee NH, **Hoffman EP**. Osteopontin is linked with AKT, FoxO1, and myostatin in skeletal muscle cells. *Muscle Nerve*. 2017 Dec;56(6):1119-1127. doi: 10.1002/mus.25752. Epub 2017 Aug 13. PubMed PMID: 28745831; PubMed Central PMCID: PMC5690863.

Novak JS, Hogarth MW, Boehler JF, Nearing M, Vila MC, Heredia R, Fiorillo AA, Zhang A, **Hathout Y, Hoffman EP**, Jaiswal JK, **Nagaraju K**, Cirak S, Partridge TA. Author Correction: Myoblasts and macrophages are required for therapeutic morpholino antisense oligonucleotide delivery to dystrophic muscle. *Nat Commun*. 2018 Mar 23;9(1):1256. doi: 10.1038/s41467-018-03709-8. PubMed PMID: 29572439; PubMed Central PMCID: PMC5865121.

Oates EC, Jones KJ, Donkervoort S, Charlton A, Brammah S, Smith JE 3rd, Ware JS, Yau KS, Swanson LC, Whiffin N, Peduto AJ, Bournazos A, Waddell LB, Farrar MA, Sampaio HA, Teoh HL, Lamont PJ, Mowat D, Fitzsimons RB, Corbett AJ, Ryan MM, O'Grady GL, Sandaradura SA, Ghaoui R, Joshi

H, Marshall JL, Nolan MA, Kaur S, Punetha J, Töpf A, Harris E, Bakshi M, Genetti CA, Marttila M, Werlauff U, Streichenberger N, Pestronk A, Mazanti I, Pinner JR, Vuillerot C, Grosmann C, Camacho A, Mohassel P, Leach ME, Foley AR, Bharucha-Goebel D, Collins J, Connolly AM, Gilbreath HR, Iannaccone ST, Castro D, Cummings BB, Webster RI, Lazaro L, Vissing J, Coppens S, Deconinck N, Luk HM, Thomas NH, Foulds NC, Illingworth MA, Ellard S, McLean CA, Phadke R, Ravenscroft G, Witting N, Hackman P, Richard I, Cooper ST, Kamsteeg EJ, **Hoffman EP** et al. Congenital Titinopathy: Comprehensive characterization and pathogenic insights. *Ann Neurol*. 2018 Jun;83(6):1105-1124. doi: 10.1002/ana.25241. PubMed PMID: 29691892; PubMed Central PMCID: PMC6105519.

Pauling EE. The skinny on weight-loss medications. *Pharm Times*. Published November 30, 2017.

Perovanovic J, **Hoffman EP**. Mechanisms of allelic and clinical heterogeneity of lamin A/C phenotypes. *Physiol Genomics*. 2018 Sep 1;50(9):694-704. doi: 10.1152/physiolgenomics.00128.2017. Epub 2018 May 11. PubMed PMID: 29750601.

Puthenveetil S, He H, Loganzo F, Musto S, Teske J, Green M, Tan X, Hosselet C, Lucas J, **Tumey LN**, Sapra P, Subramanyam C, O'Donnell CJ, Graziani EI. Multivalent peptidic linker enables identification of preferred sites of conjugation for a potent thialanstatin antibody drug conjugate. *PLoS One*. 2017 May 30;12(5):e0178452. doi: 10.1371/journal.pone.0178452.

Ruehle MA, Stevens HY, **Beedle AM**, Guldberg

RE, Call JA. Aggregate mesenchymal stem cell delivery ameliorates the regenerative niche for muscle repair. *J Tissue Eng Regen Med*. 2018 Aug;12(8):1867-1876. doi: 10.1002/term.2707. Epub 2018 Jun 25. PubMed PMID: 29774991.

Sannino DR, Dobson AJ, **Edwards K**, Angert ER, Buchon N. The *Drosophila melanogaster* Gut Microbiota Provisions Thiamine to Its Host. *MBio*. 2018 Mar 6;9(2). pii: e00155-18. doi: 10.1128/mBio.00155-18. PubMed PMID: 29511074; PubMed Central PMCID: PMC5845000.

Shi Y, Johnsen A and **Di Pasqua AJ**. Holmium for use in cancer therapy. *Comments Inorg. Chem*. 37, 281-300.

Sreetama SC, Chandra G, Van der Meulen JH, Ahmad MM, Suzuki P, Bhuvanendran S, **Nagaraju K**, **Hoffman EP**, Jaiswal JK. Membrane Stabilization by Modified Steroid Offers a Potential Therapy for Muscular Dystrophy Due to Dysferlin Deficit. *Mol Ther*. 2018 Sep 5;26(9):2231-2242.

Tumey NL and Han S. ADME Considerations for the Development of Biopharmaceutical Conjugates Using Cleavable Linkers. *Current Topics in Medicinal Chemistry*, 2017, 17(32), 3444-3462.

Tumey NL. Next generation payloads for ADCs Springer Publishing, Innovations for Next-Generation Antibody-Drug Conjugates, 2018 (book chapter).

Tumey NL. Thinking Small and Dreaming Big: Medicinal Chemistry Strategies for Designing Optimal ADCs, 2017, *Medicinal Chemistry Reviews*, Chapter 19, 2017, 52, 363-379.

Van Putten M, Aartsma-Rus A, Grounds MD, Kornegay JN, Mayhew A, Gillingwater TH, Takeda S, Rüegg MA, De Luca A, **Nagaraju K**, Willmann R. Update on Standard Operating Procedures in Preclinical Research for DMD and SMA Report of TREAT-NMD Alliance Workshop, Schiphol Airport, 26 April 2015, The Netherlands. *J Neuromuscul Dis*. 2018;5(1):29-34.

Vila MC, Rayavarapu S, Hogarth MW, Van der Meulen JH, Horn A, Defour A, Takeda S, Brown KJ, **Hathout Y**, **Nagaraju K**, Jaiswal JK. Mitochondria mediate cell membrane repair and contribute to Duchenne muscular dystrophy. *Cell Death Differ*. 2017 Feb;24(2):330-342. PubMed PMID: 27834955.

Wang L, Almeida LEF, Kamimura S, van der Meulen JH, **Nagaraju K**, Quezado M, Wakim P, Quezado ZMN. The role of nitrite in muscle function, susceptibility to contraction injury, and fatigability in sickle cell mice. *Nitric Oxide*. 2018 Nov 1;80:70-81. doi: 10.1016/j.niox.2018.08.005. Epub 2018 Aug 14. PubMed PMID:30114530; PubMed Central PMCID: PMC6186197.

Willmann R, Gordish-Dressman H, Meinen S, Rüegg MA, Yu Q, **Nagaraju K**, Kumar A, Girgenrath M, Coffey CBM, Cruz V, Van Ry PM, Bogdanik L, Lutz C, Rutkowski A, Burkin DJ. Improving Reproducibility of Phenotypic Assessments in the DyW Mouse Model of Laminin-2 Related Congenital Muscular Dystrophy. *J Neuromuscul Dis*. 2017;4(2):115-126. PubMed PMID: 28550268; PubMed Central

Yu Q, Morales M, Li N, Fritz AG, Ruobing R, Blaeser A, Francois E, Lu QL, **Nagaraju K**, Spurney CF. Skeletal, cardiac, and respiratory

muscle function and histopathology in the P448Lneo- mouse model of FKRP-deficient muscular dystrophy. *Skelet Muscle*. 2018 Apr 6;8(1):13.

Zillikens MC, Demissie S, Hsu YH, Yerges-Armstrong LM, Chou WC, Stolk L, Livshits G, Broer L, Johnson T, Koller DL, Kutalik Z, Luan J, Malkin I, Ried JS, Smith AV, Thorleifsson G, Vandenput L, Hua Zhao J, Zhang W, Aghdassi A, Åkesson K, Amin N, Baier LJ, Barroso I, Bennett DA, Bertram L, Biffar R, Bochud M, Boehnke M, Borecki IB, Buchman AS, Byberg L, Campbell H, Campos Obanda N, Cauley JA, Cawthon PM, Cederberg H, Chen Z, Cho NH, Jin Choi H, Claussnitzer M, Collins F, Cummings SR, De Jager PL, Demuth I, Dhonukshe-Rutten RAM, Diatchenko L, Eiriksdottir G, Enneman AW, Erdos M, Eriksson JG, Eriksson J, Estrada K, Evans DS, Feitosa MF, Fu M, Garcia M, Gieger C, Girke T, Glazer NL, Grallert H, Grewal J, Han BG, Hanson RL, Hayward C, Hofman A, **Hoffman EP** et al. Large meta-analysis of genome-wide association studies identifies five loci for lean body mass. *Nat Commun*. 2017 Nov 7;8(1):1414. doi: 10.1038/s41467-017-01008-2. PubMed PMID: 29116125; PubMed Central PMCID: PMC5676783.

Our funding

Total research expenditures: \$2,711,069

Aaron Beedle

\$169,209

total expenditures

\$100,000

Is MTOR inhibition a valid therapy for
dystroglycan muscular dystrophy
Muscular Dystrophy Association of America

\$30,000

Structure and Function in Alpha-
Dystroglycan Glycosylation (Prime:
5R01GM11193904)
University of Georgia

\$39,209

Structure and Function in Alpha-
Dystroglycan Glycosylation (2R01GM111939)

Yetrib Hathout

\$1,696,674

total expenditures

\$117,888

Development and Validation of
Pharmacodynamics Biomarkers for
Duchenne
Muscular Dystrophy Association of America

\$292,672

RPDP: Bridging pharmacodynamic
biomarkers to clinical outcomes in
pediatric inflammatory diseases- Core A
5U54HD090254-02
Children's Research Institute

\$392,913

Generating the Evidentiary Data Package for
Dystrophin Biomarker Qualifications
*U.S. Army Medical Research Acquisition
Activity*

\$893,201

Clinical Utility of Serum Protein Biomarkers in
Very Young Duchenne Muscular Dystrophy Boys
U.S. Army Medical Research Acquisition Activity

Eric Hoffman

\$78,002

total expenditures

\$78,002

RPDP: Bridging pharmacodynamics
biomarkers to clinical outcomes in pediatric
inflammatory diseases PTE Federal Award
No: 5U54HD090254-02
Children's Research Institute

Wesley Kufel

\$17,472

total expenditures

\$17,472

Impact of a Pharmacist-Driven Collaborative
Initiative for Staphylococcus Aureas
Bacteremia Management
*American Society of Health System
Pharmacists*

Kanneboyina Nagaraju

\$749,712

total expenditures

\$390,000

Dystrophin turnover after exon-skipping
*National Institute of Neurological Disorders
and Stroke*

\$237,390

Virus Induced Genetic Changes in the
Pathogenesis of Autoimmune Myositis
*National Institute of Allergy and Infectious
Diseases*

\$100,000

Urine Biomarkers in Juvenile Dermatomyositis
Myositis Association

\$22,322

Understanding the Mechanism and Role of
Cell Membrane Repair in Miyoshi Myopathy
Children's Research Institute





School of Pharmacy and Pharmaceutical Sciences

PO Box 6000 Binghamton, NY 13902-6000

96 Corliss Ave. Johnson City, N.Y. 13790

binghamton.edu/pharmacy-and-pharmaceutical-sciences