

CURRICULUM VITAE

J. ANDREW MACKAY

Gavin S. Herbert Associate Professor of Pharmacology and Pharmaceutical Sciences
Associate Professor of Biomedical Engineering (secondary)
Associate Professor of Ophthalmology (secondary)
University of Southern California
School of Pharmacy

OBJECTIVE

I explore the biophysics and engineering of 'protein-polymers' as molecular tools and therapeutics. Protein-polymers are high molecular weight repetitive polypeptides with properties of polymers that can be expressed in cells, fused to functional peptides, and tuned to respond to environmental cues. Composed entirely from genetically engineered materials, their composition can be precisely tailored at the DNA level. Using these novel materials, my group has recently made significant breakthroughs to assemble microstructures inside living cells that modulate cellular biology, to develop state-of-the-art molecular imaging approach called image-driven pharmacokinetics, and to develop novel peptide therapeutics for ocular disease and cancer.

PERSONAL INFORMATION

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ACADEMIC BACKGROUND

1995-1999 S. B. in Chemical Engineering, S. B. in Biology, minor in Music, minor in Biomedical Engineering, Massachusetts Institute of Technology, Cambridge, MA
2000-2005 Ph. D. in Bioengineering, University of California, Berkeley and San Francisco, CA

PROFESSIONAL EXPERIENCE

1997- 1999 Undergraduate Research Assistant, Research Mentor: Robert Langer, Massachusetts Institute of Technology, Cambridge, MA
1997 NSF-REU Research Intern, Research Mentor: David Murhammer, University of Iowa, Iowa City, IA
1998 Research Intern, Millennium Pharmaceuticals Inc., Cambridge MA
1999-2000 Bioprocess Engineer, Antigenics Inc., Woburn, Ma
2000-2005 Graduate Student, Research Mentor: Francis C Szoka, Graduate Group in Bioengineering at the University of California at San Francisco and Berkeley, CA

Curriculum Vitae, John Andrew MacKay, Ph. D.

2005-2008 Postdoctoral Fellow, Research Mentor: Ashutosh Chilkoti, Department of Biomedical Engineering, Duke University, Durham, NC
2008-2016 Assistant Professor, Department of Pharmacology and Pharmaceutical Sciences, University of Southern California
2009-2016 Assistant Professor, Department of Biomedical Engineering (secondary), University of Southern California
2011-2013 Chair of Graduate Program in Pharmaceutical Sciences
2009- Member, Norris Comprehensive Cancer Center
2009- Member, USC Center for Liver Diseases
2016- Associate Professor, Department of Pharmacology and Pharmaceutical Sciences, University of Southern California
2016- Associate Professor, Department of Biomedical Engineering (secondary), University of Southern California
2017- Associate Professor, Department of Ophthalmology (secondary), University of Southern California

HONORS

1997 Abbott Award for Undergraduate Research in Biomedical Engineering
2001 Howard Hughes Medical Institute Predoctoral Fellowship
2006 Kirschstein National Research Service Award Individual Postdoctoral Fellowship
2010 Stop Cancer Research Career Development Award
2011 Wright Foundation Young Investigator Award
2016- Gavin S. Herbert Professor Chair in Pharmaceutical Sciences

RESEARCH INTERESTS

Biophysics of environmentally responsive peptides and lipids, biomolecular engineering, targeted gene/drug delivery, cancer, lymphoma, breast cancer, angiogenesis, immunology, ocular disease, dry eye disease, lacrimal gland biology, macular degeneration, corneal wound healing, targeted drug/gene delivery, nanoparticle formulation/characterization/optimization, pharmacokinetics, transcytosis, trafficking, micelles, vesicles, and intracellular protein switching.

PUBLICATIONS

PEER REVIEWED PUBLICATIONS

1. Martin I, Shastri VP, Padera RF, Yang J, **MacKay JA**, Langer R, Vunjak-Novakovic G, Freed LE. Selective differentiation of mammalian bone marrow stromal cells cultured on three-dimensional polymer foams. *J Biomed Mater Res.* 2001. 55(2): 229-35. (PMID11255174)

2. Guo X, **MacKay JA**, Szoka FC Jr. Mechanism of pH-triggered collapse of phosphatidylethanolamine liposomes stabilized by an ortho ester polyethyleneglycol lipid. *Biophys J*. 2003. 84(3):1784-95. (PMID12609880)
3. Choi JS, **MacKay JA**, Szoka FC Jr. Low-pH-sensitive PEG-stabilized plasmid-lipid nanoparticles: preparation and characterization. *Bioconjug Chem*. 2003. 14(2):420-9. (PMID12643753)
4. Li W, Huang Z, **MacKay JA**, Grube S, Szoka FC Jr. Low-pH-sensitive poly(ethylene glycol) (PEG)-stabilized plasmid nanolipoparticles: effects of PEG chain length, lipid composition and assembly conditions on gene delivery. *J Gene Med*. 2005. 7(1):67-79. (PMID15515149)
5. Krylova IN, Sablin EP, Moore J, Xu RX, Waitt GM, **MacKay JA**, Juzumiene D, Bynum JM, Madauss K, Montana V, Lebedeva L, Suzawa M, Williams JD, Williams SP, Guy RK, Thornton JW, Fletterick RJ, Willson TM, Ingraham HA. Structural analyses reveal phosphatidyl inositols as ligands for the NR5 orphan receptors SF-1 and LRH-1. *Cell*. 2005. 120(3):343-55. (PMID15707893)
6. **MacKay JA**, Deen DF, Szoka FC Jr. Distribution in brain of liposomes after convection enhanced delivery; modulation by particle charge, particle diameter, and presence of steric coating. *Brain Res*. 2005. 1035(2):139-53, cover. (PMID15722054)
7. Huang Z, Li W, **MacKay JA**, Szoka FC Jr. Thiocholesterol-based lipids for ordered assembly of bioresponsive gene carriers. *Mol Ther*. 2005. 11(3):409-17. (PMID15727937)
8. Huang Z, Guo X, Li W, **MacKay JA**, Szoka FC Jr. Acid-triggered transformation of diortho ester phosphocholine liposome. *J Am Chem Soc*. 2006. 128(1):60-1. (PMID16390121)
9. Lim DW, Trabbic-Carlson K, **MacKay JA**, Chilkoti A. Improved non-chromatographic purification of a recombinant protein by cationic elastin-like polypeptides. *Biomacromolecules*. 2007. 8(5):1417-24. (PMID17407348)
10. **MacKay JA**, Li W, Huang Z, Huynh G, Dy E, Tihan T, Collins R, Deen DF, Szoka FC Jr. HIV TAT peptide modifies the distribution of liposomes, DNA nanolipoparticles, and transfection following convection enhanced delivery. *Mol Ther*. 2008. 16(5):893-900. (PMID18388927)
11. Wu Y, **MacKay JA**, McDaniel JR, Chilkoti A, Clark RL. Fabrication of Elastin-Like Polypeptide Nanoparticles for Drug Delivery by Electrospraying. *Biomacromolecules*. 2009. 10(1):19-24. (PMID19072041)
12. Gao W, Liu W, **MacKay JA**, Zalutsky M, Toone E, Chilkoti A. In situ growth of a stoichiometric PEG-like conjugate at a protein's N-terminus with significantly improved pharmacokinetics. *Proc Nat Acad Sci*. 2009. 106(36):15231-6. (PMID19706892)
13. **MacKay JA**, Chen M, McDaniel JR, Liu W, Simnick AJ, Chilkoti A. Self-assembling chimeric polypeptide-doxorubicin conjugate nanoparticles that abolish tumors after a single injection. *Nat Materials*. 2009. 8(12):933-9. (PMC2862348)
14. McDaniel J, **MacKay JA**, Quiroz F, Chilkoti, A. Recursive Directional Ligation by Plasmid Reconstruction allows Rapid and Seamless Cloning of Oligomeric Genes. *Biomacromolecules*. 2010. 11(4):944-52. (PMC2862688)

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15. Liu W, **MacKay JA**, Dreher MR, Chen M, McDaniel JR, Simnick AJ, Callahan DJ, Zalutsky MR and Chilkoti A. Injectable intratumoral depot of thermally responsive polypeptide-radionuclide conjugates delays tumor progression in a mouse model. *J Cont Rel.* 2010. 144(1):2-9. (PMC2862899)
16. **MacKay JA**, Callahan DJ, FitzGerald KN, Chilkoti A. A quantitative model of the phase behavior of recombinant pH-responsive protein polymers. *Biomacromolecules.* 2010 Oct; 11(11): 2873–9. (PMC3032028)

PEER REVIEWED PUBLICATIONS AT THE UNIVERSITY OF SOUTHERN CALIFORNIA

17. Sun G, Hsueh P, Janib S, Hamm-Alvarez SF, **MacKay JA**. Design and cellular internalization of genetically engineered polypeptide nanoparticles displaying adenovirus knob domain. *J Cont Rel.* 2011 Oct 30; 155(2):218-26. (PMC3196066)
18. Shah M, Hsueh PY, Sun G, Chang HY, Janib SM, **MacKay JA**. Biodegradation of elastin-like polypeptide nanoparticles. *Protein Sci.* 2012 Jun;21(6):743-50. (PMC3403411)
19. Aluri SR, Pastuszka MK, Moses AS, **MacKay JA**. Elastin-like Peptide-Amphiphiles form nanofibers with tunable length. *Biomacromolecules.* 2012 Sep 10;13(9):2645-54. (PMC3461336)
20. Pastuszka MK, Janib SM, Weitzhandler I, Okamoto CT, Hamm-Alvarez SF, **MacKay JA**. A tunable and reversible platform for the intracellular formation of genetically engineered protein microdomains. *Biomacromolecules.* 2012 Nov 12; 13(11):3439-44. (PMC3500625)
21. Janib SM, Liu S, Park R, Pastuszka MK, Shi P, Moses A, Orosco M, Lin YA, Cui H, Conti P, Li Z, **MacKay JA**. Kinetic quantification of protein polymer nanoparticles using non-invasive imaging. *Integr Biol.* 2013 Jan; 5(1):183-94. (PMC3762326)
22. Dhandhukia J, Weitzhandler I, Wang W, **MacKay JA**. Switchable Elastin-Like Polypeptides that Respond to Chemical Inducers of Dimerization. *Biomacromolecules.* 2013 Apr 8; 14(4):976-85. (PMC3721738)
23. Shi P, Aluri SR, Lin YA, Shah M, Edman-Woolcott M, Dhandhukia J, Cui H, **MacKay JA**. Elastin-based protein polymer nanoparticles carrying drug at both corona and core suppress tumor growth *in vivo*. *J Cont Rel.* 2013 Nov 10;171(3):330-8. (PMC3795821)
24. Janib SM, Pastuszka MK, Aluri SR, Folchman-Wagner Z, Hsueh P, Shi P, Lin YA, Cui H, **MacKay JA**. A quantitative recipe for engineering protein polymer nanoparticles. *Polym. Chem.* 2014; 5(5), 1614-25. (PMC3916011)
25. Shah M, Edman MC, Janga SR, Shi P, Dhandhukia J, Liu S, Louie SG, Rodgers K, **MacKay JA**, Hamm-Alvarez SF. A rapamycin-binding protein polymer nanoparticle shows potent therapeutic activity in suppressing autoimmune dacryoadenitis in a mouse model of Sjögren's syndrome. *J Cont Rel.* 2013 Nov 10;171(3):269-79. (PMC3796004)
26. Shi P, Lin YA, Pastuszka M, Cui H, **MacKay JA**. Triggered Sorting and Co-Assembly of Genetically Engineered Protein Microdomains in the Cytoplasm. *Adv Mater.* 2014 Jan 22;26(3):449-54. (PMC3947098)
27. Aluri S, Shi P, Gustafson J, Wang W, Lin YA, Cui H, Liu S, Conti PS, Li Z, Hu P, Epstein AL, **MacKay JA**. A Hybrid Protein-Polymer Nanoworm Potentiates Apoptosis Better Than a Monoclonal Antibody. *ACS Nano.* 2014 Mar 25;8(3):2064-76. (PMC4004287)

28. Wang W, Sreekumar PG, Valluripalli V, Shi P, Wang J, Lin Yi-An, Cui H, Kannan R, Hinton DR, **MacKay JA**. Protein polymer nanoparticles engineered as chaperones protect against apoptosis in human retinal pigment epithelial cells. *J Cont Rel*. 2014 Oct 10;191:4-14. (PMC4222838)
29. Pastuszka MK, Okamoto CT, Hamm-Alvarez SF, **MacKay JA**. Flipping the Switch on Clathrin-Mediated Endocytosis using Thermally Responsive Protein Microdomains. *Adv Func Mater*. 2014 Sep 10;24(34):5340-5347. *Featured on issue cover*. (PMC4235962)
30. Janib SM, Gustafson, JA, Minea RO, Swenson SD, Liu S, Pastuszka MK, Lock LL, Cui H, Markland FS, Conti PS, Li Z, **MacKay JA**. Multimeric disintegrin protein polymer fusions that target tumor vasculature. *Biomacromolecules*. 2014 Jul 14;15(7):2347-58. (PMC4098058)
31. Pastuszka MK, Wang X, Lock LL, Janib SM, Cui H, DeLeve LD, **MacKay JA**. An amphipathic alpha-helical peptide from apolipoprotein A1 stabilizes protein polymer vesicles. *J Cont Rel*. 2014 Oct 10;191:15-23. (PMID: 25016969, PMC pending)
32. Wang W, Despanie J, Shi P, Edman-Woolcott MC, Lin Y-A, Cui H, J. Heur M, Fini E, Hamm-Alvarez SF, **MacKay JA**. Lacritin-mediated regeneration of the corneal epithelia by protein polymer nanoparticles *J Mater Chem B*. 2014 Dec 14;2(46):8131-8141. *Featured on inside front cover*. (PMC4270104)
33. Wang W, Jashnani A, Aluri SR, Gustafson JA, Hsueh PY, Yarber F, McKown RL, Laurie GW, Hamm-Alvarez SF, **MacKay JA**. A thermo-responsive protein treatment for dry eyes. *J Cont Rel*. 2015 Feb 10;199:156-67. (PMC4456095)
34. Hsueh PY, Edman MC, Sun G, Shi P, Xu S, Lin Y-A, Cui H, Hamm-Alvarez SF, **MacKay JA**. Tear-mediated delivery of nanoparticles through transcytosis of the lacrimal gland. *J Cont Rel*. 2015 Jun 28;208:2-13. (PMC4456098)
35. Shah M, Edman MC, Janga SR, Yarber F, Meng Z, Klinngam W, Bushman J, Ma T, Liu S, Louie S, Mehta A, Ding C, **MacKay JA**, Hamm-Alvarez SF. Rapamycin Eye Drops Suppress Lacrimal Gland Inflammation In a Murine Model of Sjögren's Syndrome. *Invest Ophthalmol Vis Sci*. 2017 Jan 1;58(1):372-385. (PMC5270623)
36. Dhandhukia JP, Brill DA, Kouhi A, Pastuszka MK, **MacKay JA**. Elastin-like polypeptide switches: A design strategy to detect multimeric proteins. *Protein Science*. 2017 Jun 22. (PMID28639381, PMC in process).
37. Dhandhukia JP, Li Z, Peddi S, Kakan S, Mehta A, Tyrpak D, Despanie J, **MacKay JA**. Berunda polypeptides - multi-headed fusion proteins promote subcutaneous administration of rapamycin to breast cancer *in vivo*. *Theranostics*. Accepted Aug 1, 2017. (PMC in process)

REVIEWS AND CHAPTERS

1. **MacKay JA**, Szoka FC Jr. HIV TAT protein transduction domain mediated cell binding and intracellular delivery of nanoparticles. *J Disp Sci Tech*. 2003 (peer-reviewed). 24(3-4): 467-73. (PMID20808712)
2. Lee CC, **MacKay JA**, Frechet JM, Szoka FC. Designing dendrimers for biological applications. *Nat Biotech*. 2005. 23(12):1517-26 (peer-reviewed). (PMID16333296)

Curriculum Vitae, John Andrew MacKay, Ph. D.

3. Chilkoti A, Christensen T, **MacKay JA**. Stimulus responsive elastin biopolymers: Applications in medicine and biotechnology. *Curr Opin Chem Biol*. 2006. 10(6):652-7 (peer-reviewed). (PMID17055770)
4. **MacKay JA**, Chilkoti A. Temperature sensitive peptides: engineering hyperthermia-directed therapeutics. *Int J Hyperthermia*. 2008. 6:1-13 (peer-reviewed). (PMID18608590)
5. Chen M, McDaniel JR, **MacKay JA**, Chilkoti, A. Nanoscale Self-Assembly for Delivery of Therapeutics and Imaging Agents. *Technology and Innovation- Proceedings of the National Academy of Inventors*. 2011. 13(1):5-25 (peer-reviewed). (PMC3784687)

REVIEWS AND CHAPTERS AT THE UNIVERSITY OF SOUTHERN CALIFORNIA

6. Aluri S, Janib SM, **MacKay JA**. Environmentally responsive peptides as anticancer drug carriers. *Adv Drug Deliv Rev*. 2009. 61(11):940-52 (peer-reviewed). (PMC2757494)
7. Pastuszka MK, **MacKay JA**. Biomolecular engineering of intracellular switches in eukaryotes. *J Drug Del Sci Tech*. 2010. 20(3): 163-9 (peer-reviewed). (PMC3013508)
8. Janib SM, Moses AS, **MacKay JA**. Imaging and drug delivery using theranostic nanoparticles. *Adv Drug Deliv Rev*. 2010 Aug 30;62(11):1052-63 (peer-reviewed). (PMC3769170)
9. Shi P, Gustafson JA, **MacKay JA**. Genetically engineered nanocarriers for drug delivery. *Int. J. Nanomedicine*. 2014 Mar 26;9:1617-26 (peer-reviewed). (PMC3970941)
10. Pastuszka MK, **MacKay JA**. Engineering structure and function using thermoresponsive biopolymers. *WIREs Nanomedicine & Nanobiotechnology*. 2015 Jun 26 (peer-reviewed). (PMC4732732)
11. Brill DA, **MacKay JA**. Image-Driven Pharmacokinetics: Nanomedicine Concentration Across Space and Time. *Nanomedicine (Lond.)* 2015 10(18): 2861-79. (peer-reviewed). (PMID26370694)
12. Despanie J, Dhandhukia J, Hamm-Alvarez SF, **MacKay JA**. Elastin-like polypeptides: Therapeutic applications for an emerging class of nanomedicines. *J Cont Rel*. 2015 Nov 11. pii: S0168-3659(15)30234-0. doi: 10.1016/j.jconrel.2015.11.010 (peer-reviewed). (PMID26578439)

EDITED VOLUMES

1. Co-editor, with Zibo Li, *Advanced Drug Delivery Reviews* issue entitled “Development of theranostic agents that co-deliver therapeutic and imaging agents”, 62(11) 2010.

PATENTS

1. Chilkoti A, **MacKay JA**, Dreher M. A method for controlling the biopolymer architecture, pharmacokinetics, and biodistribution by selection of drug position. Duke University. Provisional filed November 2007. Provisional filed 2008.
2. **MacKay JA**, Wang W. Controlled release of ocular biopharmaceuticals using bioresponsive protein polymers. USC Stevens Institute (USC Ref: 11-692). Provisional filed July 2011. Provisional filed July 26, 2012.

Curriculum Vitae, J. Andrew MacKay, Ph. D.

3. Hamm-Alvarez SF, **MacKay JA**, Sun G. Methods and Therapeutics Comprising Ligand Targeted ELPs. USC Stevens Institute (USC Ref: 11-358). Provisional filed February 13, 2012. Provisional filed February 11, 2013.
4. Epstein A, **MacKay, JA**, Hu P, Aluri, S. A targeted protein polymer nanomedicine for B-cell lymphoma. USC Stevens Institute (USC Ref: 13-115). Nationalize PCT filed Feb 6, 2015.
5. **MacKay JA**, Hamm-Alvarez SF, Shi P, Dhandhukia J, Shah M. Methods and small molecule therapeutics comprising fused ELPs. USC Stevens Institute (USC Ref: 13-206). Nationalized PCT filed Feb 6, 2015.
6. Hamm-Alvarez SF, **MacKay JA**, Hsueh P. A peptide-mediated approach to target therapeutic protein polymers to inflammatory diseases of the lacrimal gland. USC Stevens Institute. USC Stevens Institute (USC Ref: 13-222) Provisional filed October 29, 2013.
7. **MacKay JA**, Wang W, Laurie G. Protein-Polymer Delivery to the Ocular Surface by Contact Lenses. USC Stevens Institute (USC Ref: 13-532). Provisional filed March 29, 2013 and licensed to Tear Solutions, LLC, 2014.
8. **MacKay JA**, Dhandhukia J, Peddi S, Roberts K. Protein-Polymer Fusions for Subcutaneous Delivery of Small Molecules. USC Stevens Institute (USC Ref: 2016-185). Provisional filed June 3, 2016.
9. **MacKay JA**, Guo H, Despanie J. Generation of Hemoglobin-based Oxygen Carriers using Elastin-like Polypeptides. USC Stevens Institute (USC Ref: 2016-244). Provisional filed July 15, 2016.

GRANT SUPPORT

ACTIVE

1. “Intracellular switching using genetically engineered protein microdomains”; NIH/NIGMS 1R01GM114839-02; **J. Andrew MacKay, PI**; 20% effort; \$ 1,586,845 (total); April 1, 2015 – March 31, 2020. (*Scored 5th percentile*)
2. “Protein-polymer nanomedicine for Sjögren’s Syndrome”; NIH/NEI 1R01EY026635-01; **J. Andrew MacKay**; Sarah Hamm-Alvarez, **multi-PI**; 10% effort; \$2,062,500 (total); Sept 1, 2016 – March 31, 2021. (10th percentile, Approved for Funding December 2016)
3. “Protein-polymer nanomedicines for ocular therapy”; Whittier Foundation; Ed Crandall PI (**J. Andrew MacKay, Co-investigator**); 0.6 % effort, 200,000 (direct); March 1, 2016-December 31, 2017.
4. “An experimental approach to maculopathy”; NIH/NEI R01EY001545-34; David Hinton, PI (**J. Andrew MacKay, Co-investigator**); 0.6 % effort, \$2,037,000 (total); April 1, 2012 - March 31, 2018. (*Scored 2nd percentile*)
5. “Microtubule-based transport in lacrimal gland function”; NIH/NEI 1R01EY011386-16; Hamm-Alvarez, PI (**J. Andrew MacKay, Co-investigator**). 5% effort. \$2,600,129 (total). 07/01/16-06/30/21. (*Scored 4th percentile*)

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6. “Preclinical advancement of FKBP/Rapalogue drug carriers”; USC Stevens Institute Technology Advancement Grant. **J. Andrew MacKay, PI**; 5% effort; \$50,000 (direct). July 1st, 2017 – June 30th, 2018.

PENDING

7. “FKBP elastin-like polypeptide fusions for sustained delivery of mTOR inhibitors.” NIH/NCI 1R41CA224621-01; Kenny Roberts, PI (**J. Andrew MacKay, Co-investigator**); 5% effort; \$100,000 (total subcontract). April 1st, 2018 – May 30th, 2019.

PREVIOUSLY HELD

1. “Targeting liposomal drug and gene delivery and the osmotic pressure of tumors”; Howard Hughes Medical Institute Pre-doctoral Fellowship; **J. Andrew MacKay, PI**; 100% effort; August 1, 2001 - March 31, 2005.
2. “pH sensitive elastin-like-peptides for tumor targeting”; NIH/NCI F32 CA123889 Kirschstein National Research Service Award; **J. Andrew MacKay, PI**; 100% effort; \$94,772; July 1, 2006 - June 30, 2008.
3. “Hepatic trafficking and anti-tumor activity of genetically engineered glyco-celles”; NIH/NIDDK P30 DK048522-15 Pilot; **J. Andrew MacKay, PI**; 0% effort; \$37,500 (direct); March 1, 2009 - February 28, 2010.
4. “Positron emission tomography of peptide-drug nanoparticles targeted to the tumor blood supply”; American Cancer Society IRG-58-007-48 Pilot; **J. Andrew MacKay, PI**; 0% effort; \$20,000 (direct); June 1, 2009 - May 30, 2010.
5. “Ad5 fiber entry and trafficking in lacrimal acini”; NIH/NEI R01 EY017293-04S1; Sarah Hamm-Alvarez, PI (**J. Andrew MacKay, Co-PI**); 20% effort; \$407,700 (total); August 1, 2009 - March 31, 2011.
6. “Nanoparticle encapsulated alphaB crystallin chaperone peptide as a therapeutic agent in atrophic age-related macular degeneration”; USC LACTSI Pilot; David Hinton, PI (**J. Andrew MacKay, Co-investigator**); 0% effort; \$30,000 (direct); November 1, 2010 - March 31, 2011.
7. “Biomolecular engineering of sustained-release disintegrins for cancer therapy”; Wright Foundation Young Investigator; **J. Andrew MacKay, PI**; \$45,000 (direct); 10% effort; July 1, 2011 - June 31, 2012.
8. “Diagnostic imaging of smart genetically engineered nanomedicines”; USC Ming Hsieh Institute Pilot; **J. Andrew MacKay, PI**; 15% effort; \$75,000 (direct); November 1, 2011 - October 31, 2012.
9. “A rapid, reversible switch for controlling intracellular trafficking”; NIH/NIBIB R21 EB012281; **J. Andrew MacKay, PI**; 20% effort; \$444,500 (total); July 1, 2010 - June 30 2013. (*Scored 13th percentile*)
10. “Preclinical evaluation of sustained-release disintegrins for cancer therapy”; SC-Clinical and Translational Science Institute Multidisciplinary Pilot Project; **J. Andrew MacKay, PI**; 10% effort; \$80,000 (direct); July 1, 2012 - June 30, 2013.

11. “Genetically Engineered Cancer Nanomedicines”; USC Whittier Foundation Pilot; **J. Andrew MacKay, PI**; 0% effort; \$50,000 (direct); January 1, 2012-December 31, 2013.
12. “Diagnostic imaging of smart genetically engineered nanomedicines”; USC Ming Hsieh Institute; **J. Andrew MacKay, PI**; 15% effort; \$85,000 (direct); September 1, 2013 - August 31, 2014.
13. “VRPD: Treatment of the Cornea using Transcytotic Delivery into the Tear Film”; W81XWH-12-1-0538, USAMRAA Vision Research Hypothesis Award; **J. Andrew MacKay, PI**; 5% effort; \$250,000 (total); September 30, 2012 - September 29, 2015.
14. “Bispecific hybrid nanoworms for immunotherapy of B-cell lymphoma”; USC Ming Hsieh Institute; **J. Andrew MacKay, PI**; 15% effort; \$100,000 (direct); September 1, 2014 - August 31, 2015.
15. “A Thermo-responsive Biopharmaceutical to Enhance the Tear Production of Lacritin”; NIH/NEI R41 EY 022514-01A1; Sandeep Samudre, PI (**J. Andrew MacKay, Co-investigator**); 4% effort; \$146,388 (total); September 30, 2013 - September 29, 2015. (NCE)
16. “Genetically engineered nanoparticles for cancer imaging and drug delivery”; Stop Cancer Research Career Development Award; **J. Andrew MacKay, PI**; 0% effort; \$150,000 (direct); March 1, 2011 - February 28, 2016.
17. “Encapsulation of Rhesus theta defensin-1 (RTD-1) in PEG-PLGA nanoparticles for aerosol delivery in CF”; Webb Foundation; Paul Beringer, PI (**J. Andrew MacKay, co-investigator**); 5% effort; \$10,000 (direct); November 1, 2014 - October 31, 2015.
18. “Proof-of-concept fusion of a protein-polymer to hemoglobin”; SAIMA Biopharmaceuticals; **J. Andrew MacKay, PI**; 5% effort; \$10,819 (total); June 15, 2015- November 15, 2015.
19. “Bispecific hybrid nanoworms for immunotherapy of B-cell lymphoma”; USC Ming Hsieh Institute; **J. Andrew MacKay, PI**; 15% effort; \$115,000 (direct); June 1, 2016 - August 31, 2017.

SEMINARS AND CONFERENCES

INVITED EXTRAMURAL SEMINARS

1. House Ear Institute Seminar Series. Environmentally responsive polypeptides for self-assembly and drug delivery. Los Angeles, CA. February 19, 2010.
2. Biomolecular Science and Engineering Seminar Series. Protein polymer nanoparticles: switching, sorting, and therapy. University of California at Santa Barbara. May 14, 2013.
3. Biotechnology training program seminar. Protein polymer nanomedicines. University of Virginia. March 6th, 2014.
4. Protein polymer delivery of lacritin. Lacritin Consortium, James Madison University. Harrisonburg, VA. March 7th, 2014.
5. California Nanosystems Research Institute Seminar. Switchable Protein Polymers for Medicine and Biology. University of California at Los Angeles. March 18th, 2014.
6. NanoLA Symposium. Protein polymer nanomedicines. City of Hope. Duarte, CA. June 25th, 2014.

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7. School of Pharmacy. Switchable protein polymers for medicine and biology. University of Illinois at Chicago, Chicago, IL. April 15th, 2015.
8. Organic Chemistry Seminar. Switchable protein polymers for medicine and biology. Purdue University, West Lafayette, IN. April 16th, 2015.
9. Seminar at the Wilmer Eye Institute. Switchable protein polymers for medicine and biology. Johns Hopkins University. Baltimore, MD. June 18th, 2015.
10. Seminar at the Simpson Querrey Institute for BioNanotechnology. Switchable protein polymers for medicine and biology. Northwestern University. Chicago, IL. July 27th, 2015.
11. Seminar at the Institute for Molecular Engineering. Switchable protein polymers for medicine and biology. University of Chicago. Chicago, IL. July 28th, 2015.
12. Pharmaceutics and Biomedical Engineering Seminar. Switchable protein polymers for medicine and biology. Rutgers University. October 5th, 2015.
13. Chemical Engineering Seminar. Switchable protein polymers for medicine and biology. Princeton University. Princeton, NJ. October 6th, 2015.
14. University of Washington. Switchable protein polymers for medicine and biology. Seattle, WA. November 3rd, 2015.

INVITED TALKS AT INTERNATIONAL CONFERENCES

1. **MacKay JA**, Dy E, Szoka FC Jr. HIV TAT protein transduction domain mediated delivery of liposomes to cells. Nanoparticles. Orlando, FL. April, 2002. Poster and Talk.
2. **MacKay JA**, Deen DF, Szoka FC Jr. Convection enhanced delivery of liposomes and nanolipoparticles for treatment of brain tumors. Liposome Advances. London, UK. December, 2003. Poster and Talk.
3. **MacKay JA**. Convection enhanced delivery of liposomes and nanolipoparticles for treatment of brain tumors. UCSF-UCB Joint Graduate Group in Bioengineering Annual Conference. Lake Tahoe, CA. October, 2004. Talk.
4. **MacKay JA**, Chen M, McDaniel JR, Liu W, Chilkoti A. Self-assembly of thermally responsive nanoparticles from an elastin-like polypeptide drug conjugate with anti-tumor efficacy. Society for Thermal Medicine. Tucson, AZ. April, 2009. Talk.
5. **MacKay JA**, Janib S, Moses S, Pastuszka M, Sun G, Valluripalli V. Genetically engineered polypeptosomes. Particles. Orlando, FL. May, 2010. Talk.
6. **MacKay, JA**. Genetically engineered polypeptosomes. Nano Drug Delivery Symposium. Omaha, NB. October, 2010. Talk.
7. **MacKay JA**, Janib SM, Moses A, Shi P, Aluri S, Pastuszka M, Sun G, Valluripalli V. Genetically engineered polypeptide nanoparticles. American Chemical Society Western Regional Meeting. Pasadena, CA. November, 2011. Talk.
8. **MacKay JA**. Hsueh P, Sun G, Shi P, Shah M, Dhandhukia J, Wang W, Lin Y, Cui H, Hamm-Alvarez SF. Therapeutic protein polymer nanoparticles. International Light Scattering Colloquium. Santa Barbara, CA. October, 2012. Talk.
9. **MacKay JA**, Janib SM, Shi P, Moses A, Shah M, Dhandhukia J, Gustafson J, Lin Y, Cui H. Design and molecular imaging of protein polymer nanoparticles. Nano Drug Delivery Symposium. Atlantic City, NJ. December, 2012. Talk.

10. **MacKay JA**, Aluri S, Shi P, Janib SM, Dhandhukia J, Gustafson J, Hu P, Epstein A. Protein polymer nanoparticles with multivalent avidity for small molecules or cell-surface receptors. American Chemical Society National Meeting. Indianapolis, IN. September, 2013. Talk.
11. **MacKay JA**, Wang W, Laurie GW, Hamm-Alvarez SF. Protein polymer mediated delivery of lacritin therapeutics. National Meeting of the Tear Film & Ocular Surface Society. Taormina, Sicily. September, 2013. Talk.
12. **MacKay JA**, Shi P, Janib SM, Dhandhukia J, Gustafson J, Liu S, Conti P, Li Z. Image-driven pharmacokinetics of therapeutic protein polymer nanoparticles. UCLA-USC-Caltech Nanotechnology & Nanomedicine Symposium, Los Angeles, CA. October, 2013. Talk.
13. **MacKay JA**, Pastuszka MK, Shi P, Dhandhukia J. Triggered Assembly of Functional Protein Microdomains in the Cytosol. TechConnect World, Washington DC. June, 2014. Talk.
14. **MacKay JA**, Wang W, Hsueh P-Y, Edman M, Hamm-Alvarez SF. Ocular delivery of a model biopharmaceutical, lacritin, using protein polymers. Controlled Release Society. Chicago, IL. July 2014. Talk.
15. **MacKay JA**, Li Z, Dhandhukia J, Hadaczek P, Beyer J, Shi P, Bankeiwicz K. Protein Polymer Nanomedicines for Cancer. Annual Meeting of the Society for Brain Mapping and Therapeutics. Los Angeles, CA. March, 2015. Talk.
16. **MacKay JA**, Li Z, Dhandhukia J, Truong A, Pastuszka MK, Shi P, Hamm-Alvarez SF, Okamoto C. Artificial organelles: Cellular expression and assembly of polypeptide microdomains. Annual Meeting of the American Chemical Society. Denver, CO. March 2015. Talk.
17. **MacKay JA**, Medina-Kauwe L, Deming T, Wang P, Rome L. Preclinical Development of Biological Nanomedicines in the Greater Los Angeles Area. 3rd Nanomedicine for Imaging and Treatment Conference. Los Angeles, CA. March, 2015. Talk.
18. **MacKay JA**, Roberts K, Shi P, Wang W, Aluri S. Targeted protein polymer nanomedicines carrying rapamycin. TechConnect World, Washington, DC. June, 2015. Talk.
19. **MacKay JA**, Li Z, Tyrpak D, Park M, Lee C, Kouhi A, Dhandhukia J, Hamm-Alvarez SF, Okamoto C. Intra- and extra-cellular manipulation of cell signaling using elastin-like polypeptides. Annual Meeting of the American Chemical Society. San Francisco, CA. April 2017. Talk.

POSTERS PRESENTED AT INTERNATIONAL CONFERENCES

1. **MacKay JA**, Chuang WL, Szoka FC Jr. Mechanism of HIV TAT protein transduction domain mediated liposome internalization into cells. Biophysical Society Annual Meeting. San Francisco, CA. January, 2002. Poster.
2. **MacKay JA**, Li W, Deen DF, Szoka FC Jr. Development of a synthetic gene vector to treat brain tumors. Society for Neuro-oncology Annual Meeting. Keystone, CO. November, 2003. Poster.

3. **MacKay JA**, Li W, Huang Z, Szoka FC Jr. Sequential assembly of multifunctional nanolipoparticles for nucleic acid delivery. NIBIB Annual Grantee Meeting. Washington, DC. August, 2005. Poster.
4. **MacKay JA**, Liu W, Fitzgerald K, Chilkoti A. Environmentally responsive elastin biopolymers for anti-tumor drug delivery. Gordon Research Conference on Chemistry of Supramolecular Assemblies. Barga, Italy. May, 2007. Poster.
5. **MacKay JA**, Jashnani A, Shah M, Janib S, Valluripalli V, Pastuszka M, Hsueh P, Hamm-Alvarez SF. Controlled ocular drug delivery using peptide-mediated phase separation. Association for Research in Vision and Ophthalmology. Fort Lauderdale, FL. May, 2010. Poster.
6. **MacKay JA**, Janib SM, Moses A, Shi P, Aluri S, Pastuszka M, Sun G, Valluripalli V. Genetically engineered polypeptide nanoparticles. Gordon Research Conference on Cancer Nanotechnology. Waterville, ME. July, 2011. Poster.
7. **MacKay JA**, Janib SM, Moses A, Shi P, Aluri S, Pastuszka M, Sun G, Valluripalli V. Genetically engineered polypeptide nanoparticles. Nano Drug Delivery Symposium. Salt Lake City, UT. October, 2011. Poster.
8. **MacKay JA**, Wang W, Droese B, Shah M, Sun G, Hsueh P, Hamm-Alvarez SF. Ocular drug delivery using a thermo-responsive lacritin fusion protein. Association for Research in Vision and Ophthalmology. Fort Lauderdale, FL. May, 2012. Poster.
9. **MacKay JA**, Hsueh P, Sun G, Shi P, Shah M, Dhandhukia J, Wang W, Lin Y, Cui H, Hamm-Alvarez SF. Protein polymer nanomedicines targeted to the ocular surface. American Association of Pharmaceutical Sciences. Chicago, IL. October, 2012. Poster.
10. **MacKay JA**, Dhandhukia J, Despanie J, Kouhi A, Aluri S, Shi P, Hu P, Epstein A. Protein Polymer Nanomedicines for Cancer. Gordon Research Conference on Cancer Nanotechnology. West Dover, VT. June, 2015. Poster.

INTRAMURAL SEMINARS

1. Department of Biomedical Engineering Seminar Series. Genetically engineered drug carriers/switches: behavior, architecture, and anti-tumor activity. University of Southern California. February 2, 2009.
2. Norris Comprehensive Cancer Center Grand Rounds. Bioresponsive elastin-like polypeptides for drug delivery. University of Southern California. April 28, 2009.
3. Biomedical Nanoscience Retreat. Polypeptide-mediated assembly and disassembly of nanoparticulates. University of Southern California. November 20, 2009.
4. Research Center for Liver Disease Symposium. Hepatic trafficking and anti-tumor activity of genetically engineered glyco-celles. University of Southern California. March 5, 2010.
5. Developmental Therapeutics Retreat. Repackaging drugs into genetically engineered nanocarriers. University of Southern California. April 6, 2010.
6. Department of Physics. Genetically engineered polypeptosomes. University of Southern California. June 2, 2010.
7. Department of Biomedical Engineering Seminar Series. Drug delivery using environmentally responsive polypeptides. University of Southern California. October 18, 2010.

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8. Keck School of Medicine Seminar Series. Protein polymers- a platform for biopharmaceutical delivery and self-assembly. University of Southern California. June 27, 2011.
9. Department of Biomedical Engineering Seminar Series. Protein polymers- a platform for biopharmaceutical delivery and self-assembly. University of Southern California. August 26, 2011.
10. Host-Pathogen Retreat. Protein polymers as drug carriers. University of Southern California. September 8, 2011
11. Ming Hsieh Institute Symposium. Diagnostic imaging of smart genetically engineered nanomedicines. University of Southern California. September 29, 2011.
12. Pharmacology and Pharmaceutical Sciences Retreat and Conference. Genetically engineered drug carriers. Palm Desert, CA. January 5, 2012.
13. Pfizer at USC. Protein polymers as drug carriers. University of Southern California. March 1, 2012.
14. Board of Trustees Meeting. Research vision and Bio-Nanoengineering program. University of Southern California. May 2, 2012.
15. Department of Biomedical Engineering Seminar Series. Protein polymers- a platform for biopharmaceutical delivery and self-assembly. University of Southern California. August 24, 2012.
16. Whittier Foundation Retreat. Genetically engineered cancer nanomedicines. University of Southern California. September 22, 2012.
17. Ming Hsieh Institute Symposium. Diagnostic imaging of smart genetically engineered nanomedicines. University of Southern California. October 12, 2012.
18. Preclinical Imaging Workshop, Molecular Imaging Center. Image driven pharmacokinetics of protein polymer nanoparticles. University of Southern California. November 6th, 2013.
19. Programs in Biological and Biomedical Sciences Seminar Series. Protein polymers- a platform for biopharmaceutical delivery and self-assembly. University of Southern California. October 19th, 2013
20. Moving Targets Symposium. Keynote-New Horizons in Anti-Cancer Therapeutics. University of Southern California. Los Angeles, CA. August 22nd, 2014.
21. Programs in Biological and Biomedical Sciences Seminar Series. Protein polymers- a platform for biopharmaceutical delivery and self-assembly. University of Southern California. Los Angeles, CA. September 3rd, 2014

TEACHING

GRADUATE COURSES

1. **Advanced Pharmacokinetics/Pharmacodynamics**. (PSCI 662). Area of lecture specialization: pharmacokinetics. Course Coordinator (2017-). 12 lecture hours.
2. **Pharmacology** (MPTX 502). Areas of lecture specialization: introductory pharmacokinetics. Course coordinator 2009-2010, 2015. Lecturer (2009-). 6 lecture hours.

Curriculum Vitae, John Andrew MacKay, Ph. D.

3. **Drug Transport and Delivery** (PSCI 665). Areas of lecture specialization: drug targeting. Lecturer (2009-2013, 2014-). 4 lecture hours.
4. **Research Methods** (PPSI 556). Areas of lecture specialization: nanoparticle characterization. Lecturer (2009-2012, 2014-). 2 lecture hours.
5. **Preclinical Experimental Therapeutic Drug Development**. (CXTTP 609). Areas of lecture specialization pharmacokinetics of nanoparticles. Lecturer (2013-). 2 lecture hours.
6. **Introduction to Tools and Techniques for Chemical Biology**. (PSCI 557). Areas of lecture specialization environmentally responsive polypeptides. Lecturer (2016-). 2 lecture hours.
7. **Nanomedicine and Drug Delivery**. (BME 559). Areas of lecture specialization pharmacokinetics of nanomedicines. Lecturer (2016-). 4 lecture hours.

PROFESSIONAL/PHARM D COURSES

1. **Pharmacokinetics** (PHRD 559). Course in the therapeutics core sequence covering principles and clinical applications of pharmacokinetics. Offered every fall term to 191 1st year Pharm D students. Course coordinator and lecturer (2011-). 16 lecture hours.
2. **Pharmaceutics III: Advanced Drug Delivery** (PHRD 552). 3rd and final course in the Pharmaceutics core sequence covering advanced drug targeting strategies, systemic drug delivery and biologically based drugs. Offered every spring term to 170-180 2nd year Pharm D students. Areas of lecture specialization: liposomes. Lecturer (2009-2012, 2016). 2 lecture hours.
3. **Industrial Approaches to Drug Discovery** (RSCI 531). Instruction in regulatory aspects surrounding early stage drug development. Areas of lecture specialization: liposomes and protein polymers. Lecturer (2009-2012). 2 lecture hours.

PROFESSIONAL EDUCATION SEMINARS

1. **Continuing Medical Education**. 17th Annual USC School of Pharmacy/QSAD Centurion Winter Retreat. "Protein polymers for drug delivery", January 27, 2012.
2. Imaging Short Course, Globalization of Pharmaceutics Education Network. Theranostic nanoparticles for imaging and drug delivery. Melbourne, Australia. November 2012.
3. Imaging Short Course, Globalization of Pharmaceutics Education Network. Theranostic Nanosystems: Opportunities and Challenges. Helsinki, Finland. August 30th, 2014.

GRADUATE AND POSTDOCTORAL TRAINING

PHD STUDENTS SUPERVISED

Suhaas Aluri	Ph.D. 2013, Pharmaceutical Sciences
Siti M Janib	Ph.D. 2013, Pharmaceutical Sciences
Martha Pastuszka	Ph.D. 2014, Molecular Pharmacology and Toxicology
Pu Shi	Ph.D. 2014, Pharmaceutical Sciences
Wan Wang	Ph.D. 2014, Pharmaceutical Sciences
Jugal Dhandhukia	Ph.D. 2017, Pharmaceutical Sciences
Jordan Despanie	Ph.D. candidate, Pharmaceutical Sciences

Curriculum Vitae, J. Andrew MacKay, Ph. D.

Hao Guo	Ph.D. candidate, Pharmaceutical Sciences (co-advised)
Aida Kouhi	Ph.D. candidate, Pharmaceutical Sciences
Changrim Li	Ph.D. candidate, Pharmaceutical Sciences
Zhe Li	Ph.D. candidate, Pharmaceutical Sciences
Mincheol Park	Ph.D. candidate, Pharmaceutical Sciences
Santosh Peddi	Ph.D. candidate, Pharmaceutical Sciences
David Tyrpak	Ph.D. candidate, Pharmaceutical Sciences
Hugo Avila	Ph.D. candidate, Pharmaceutical Sciences
Anh Truong	Ph.D. candidate, Pharmaceutical Sciences

PHD STUDENT FELLOWSHIP AWARDS:

2008-2012	Siti Janib, Federal Scholarship by the Government of Malaysia
2009-2011	Ara Moses, USC School of Pharmacy Dean's Fellowship
2011-2013	Martha Pastuszka, American Foundation for Pharmaceutical Education Predoctoral Fellowship
2012-2013	Martha Pastuszka, USC Manning Fellowship
2014-2015	Jordan Despanie, SC-CTSI TL1 Fellowship
2015	Jordan Despanie, GlaxoSmithKline Science Achievement Award
2014-2015	Aida Kouhi, USC School of Pharmacy Dean's Fellowship
2014-2015	Changrim Li, USC Provost's Fellowship
2014-2015	David Tyrpak, USC Provost's Fellowship
2016-2018	Jordan Despanie, Research Supplement to Promote Diversity

MEMBER PHD STUDENT COMMITTEES

Chiun-Wei Huang	Ph.D. 2010, Biomedical Engineering
Rui Zhu	Ph.D. 2011, Biomedical Engineering
Helen Ha	Ph.D. 2012, Pharmaceutical Sciences
Ken Lo	Ph.D. 2012, Pharmaceutical Sciences
Robert Mo	Ph.D. 2012, Pharmaceutical Sciences
Shili Xu	Ph.D. 2012, Pharmaceutical Sciences
Brittany Kay	Ph.D. 2012, Biomedical Engineering
Liviawati Wu	Ph.D. 2014, Biomedical Engineering
Pang-Yu Hsueh	Ph.D. 2015, Pharmaceutical Sciences (co-advised)
Zhen Meng	Ph.D. 2016, Pharmaceutical Sciences
Mihir Shah	Ph.D. 2016, Pharmaceutical Sciences (co-advised)
Howard Chang	Ph.D. 2016, Genetic, Molecular, and Cellular Biology
Dab Brill	Ph.D. candidate, Pharmaceutical Sciences
Xiaojing Shi	Ph.D. candidate, Pharmaceutical Sciences

MS STUDENTS SUPERVISED

Suhaas Aluri	M.S. 2010, Pharmacology and Pharmaceutical Sciences
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Curriculum Vitae, John Andrew MacKay, Ph. D.

Aarti Jashnani	M.S. 2010, Pharmacology and Pharmaceutical Sciences
Sejal Parakh	M.S. 2010, Pharmacology and Pharmaceutical Sciences
Mihir Shah	M.S. 2011, Pharmacology and Pharmaceutical Sciences
Jugal Dhandhukia	M.S. 2012, Pharmacology and Pharmaceutical Sciences
Vinit Gholap	M.S. 2012, Pharmacology and Pharmaceutical Sciences
Jiawei Wang	M.S. 2014, Pharmacology and Pharmaceutical Sciences
Dab Brill	M.S. 2015, Pharmacology and Pharmaceutical Sciences
Santosh Peddi	M.S. 2015, Pharmacology and Pharmaceutical Sciences
Hao Guo	M.S. 2015, Pharmacology and Pharmaceutical Sciences
Shruti Kakan	M.S. 2017, Pharmacology and Pharmaceutical Sciences
Xiaoli Pan	M.S. candidate, Pharmacology and Pharmaceutical Sciences

MEMBER MS STUDENT COMMITTEES

Juhi Firdos	M.S. 2012, Pharmacology and Pharmaceutical Sciences
Tao Ma	M.S. 2015, Pharmacology and Pharmaceutical Sciences

INTERNATIONAL STUDENTS SPONSORED

2009	Jenan Abid (University of London)
2009	Lorcan O'Carroll (Trinity College, Dublin)
2011	Juntang Shao (China Pharmaceutical University)
2012	Fengfei Ma (China Pharmaceutical University)
2015	Marcello Martinez (University of Saarland)

PHARMD/UNDERGRADUATE/HIGH SCHOOL STUDENTS SPONSORED:

2006-2007	Kelly Fitzgerald (Duke University)
2007-2008	Melissa Schneiderman (Duke University)
2007	Michael Zimmerman (Duke University)
2009	Ais Wu (USC, Biomedical Engineering)
2009	Sarah Park (USC, Biomedical Engineering)
2010-2011	Alexa Hudnut (USC)
2011	Renee Duncan-Mestel (USC)
2011-2012	Isaac Weitzhandler (USC, Chemical Engineering)
2011	Benjamin Droese (USC, Pharm D)
2012-2013	Andrew Nelson (USC, Chemistry)
2013	Jason Pang (USC, Biomedical Engineering, Physics)
2014	Derrius Anderson (USC BTG, Morehouse, Chemistry)
2014	Josh Christian (USC SHARPP, Diamondbar High School)
2015	Joellen Chan (USC, Biomedical Engineering)
2015	Aman Rai (USC, Pharm D)
2014-2017	Anh Truong (USC, Pharm D)

POSTDOCTORAL FELLOWS TRAINED:

Curriculum Vitae, J. Andrew MacKay, Ph. D.

2009-2011 Vinod Valluripalli
2009-2012 Guoyong Sun (co-advised)
2012-2013 Joshua Gustafson

EXTERNAL SERVICE

LEADERSHIP-STUDY SECTIONS/PROFESSIONAL ORGANIZATIONS

2010-2015 Organizing committee, Nano Drug Delivery Symposium, International Annual Conference
2011 Session organizer, American Chemical Society Western Regional Meeting, Pasadena, November 2011.
2013 Co-chair, Nano Drug Delivery Symposium, San Diego, CA, Oct 25th, 2013.

MEMBERSHIPS-STUDY SECTIONS/ADVISORY BOARDS

2011 Peer review panelist, National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET); Biotech, Biochemical, & Biomass Engineering (BBBE); Stem Cell, Drug Delivery and Tissue Engineering Panel, Arlington, VA.
2011 Peer review panelist, National Institutes of Health, Bioengineering Sciences and Technologies (BST) Special Emphasis Panel (ZRG1 BST-T [90])
2012-2013 Peer review panelist, National Institutes of Health, Small Business: Basic and Integrative Bioengineering (ZRG1 IMSTA [12])
2012-2014,'16 Peer review panelist, SC-Clinical Translational Science Institute. Los Angeles, CA.
2012,'15,'16,'17 Peer review panelist, National Institutes of Health, Nanoscience (NANO) study section. Washington, DC.

PROFESSIONAL ORGANIZATIONS:

2001 Biophysical Society
2009 Society for Thermal Medicine
2009- American Chemical Society
2009- American Association of Pharmaceutical Scientists
2010- Association for Research in Vision and Ophthalmology
2011- Editorial Board, *Theranostics*
2013- Society for Controlled Release
2016- Executive Editor, *Advanced Drug Delivery Reviews*

UNIVERSITY SERVICE

2009-2010 Faculty Search Committee, Department of Pharmacology and Pharmaceutical Sciences

Curriculum Vitae, John Andrew MacKay, Ph. D.

- 2009 Organizing Co-Chair, Pharmacology and Pharmaceutical Sciences Annual Retreat and Conference
- 2009-2013 Member, Graduate Affairs Committee, Department of Pharmacology and Pharmaceutical Sciences
- 2010-2015 Consultant with the Alfred Mann Institute, University of Southern California
- 2011 Strategic Planning Implementation Team, USC School of Pharmacy
- 2011-2013 Chair, Graduate Program in Pharmaceutical Sciences
- 2011-2012 Chair, Graduate Affairs Committee, USC School of Pharmacy
- 2013-2015 Member, Assessment Committee, USC School of Pharmacy
- 2015-2016 Chair, USC School of Pharmacy Inter-Module Coordinating Committee 2009-
Faculty Advisor to Student Chapter of the American Association of
Pharmaceutical Sciences, University of Southern California
- 2016-2017 Chair, Graduate Program in Pharmaceutical Sciences
- 2016-2017 Chair, Graduate Affairs Committee, USC School of Pharmacy
- 2010-2017 Member, USC School of Pharmacy Inter-Module Coordinating Committee
- 2015- Member, USC Radioactive Drug Research Committee
- 2016-2017 Secretary, PFC Executive Board, USC School of Pharmacy
- 2016-2017 Secretary, Pharmacy Faculty Council, USC School of Pharmacy
- 2016- Stevens Institute Faculty Advisory Board