

## Justin T. Baca MD PhD, Curriculum Vitae

UNM SCHOOL OF MEDICINE  
JUSTIN T. BACA MD PhD  
CURRICULUM VITAE

December 7, 2020

Justin T. Baca MD PhD

### Professional Address including Department

Department of Emergency Medicine  
MSC 11 6025  
1 University of New Mexico  
Albuquerque, NM 87131

### Home Address

5509 Estrellita del Norte Rd. NE  
Albuquerque, NM 87111

### Licensure(s) with Date(s)

- Licensed Physician #MD2013-0577, New Mexico Medical Board, 07/03/2013-Present
- Controlled Substance Registration, license CS00219182, New Mexico Board of Pharmacy, 07/11/2013-Present
- Controlled Substance Registration, DEA registration # FB FB4030970, 07/17/2013-Present

### Certification(s) with Date(s)

- American Board of Emergency Medicine, 05/13/2014-12/13/2024

### Educational History:

- *Fellow*, 04/2018-Present, Clinical and Translational Research, University of New Mexico Clinical & Translational Science Center, Albuquerque, NM
- *Resident*, 06/2013, Harvard Affiliated Emergency Medicine Residency, Brigham & Women's Hospital and Massachusetts General Hospital, Boston, MA (major field: Emergency Medicine Residency)
- *MD*, 05/2009, University of Pittsburgh, Pittsburgh, PA (major field: Medicine)
- *PhD*, 08/2007, University of Pittsburgh, Pittsburgh, PA (major field: Chemistry)
- *AB*, 06/2001, Harvard University, Cambridge, MA (major fields: Chemistry and Physics)

### Employment History - principal positions since the terminal degree

- *Program Director, UNM MD/PhD Program*, 08/2020-Present, University of New Mexico, Albuquerque, NM
- *Associate Professor of Emergency Medicine with Tenure*, 07/2019-Present, University of New Mexico, Albuquerque, NM
- *Clinical & Translational Science Center Scholar (KL2 Scholar)*, 04/2018-Present, University of New Mexico Clinical & Translational Science Center, Albuquerque, NM
- *Assistant Professor of Emergency Medicine*, 08/2013-6/2019, University of New Mexico, Albuquerque, NM

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- *Resident Physician*, 07/2009-06/2013, Harvard Affiliated Emergency Medicine Residency: Brigham & Women's Hospital and Massachusetts General Hospital, Boston, MA

### **Employment History** – concurrent temporary or visiting appointments, consultantships, etc.

- *Instructor*, “*Toxicology and Endocrine Emergencies*,” 08/2010-08/2013, Professional Ambulance Service (Pro-EMS), Cambridge, MA
- *Attending Physician*, Taos Holy Cross Hospital, (UNM Locum Tenens), 9/2014-Present, Taos, NM
- *Attending Physician*, Miners Colfax Medical Center, (UNM Locum Tenens), 3/15-Present, Raton, NM

### **Professional recognition, honors, etc.** (teaching, research, service)

- **CTSC Scholar** in Clinical and Translational Research 04/2018-Present, mentored career development award
- **Outstanding Supervisor Award**, 2018
- **Medical Leadership Academy** Certificate of Completion, 06/2018, UNM HSC
- **Achieving Institutional Mentoring Excellence (AIME)** Faculty of Color Mentorship Pilot Project completion award, 2015, UNM HSC
- **National Institute of Biomedical Imaging and Bioengineering (NIBIB) Diversity Training Meeting Travel Award**, travel award to present research at national conference, 2007, NIBIB
- **NIH National Graduate Student Research Festival Participant**, travel award to present research at NIH Graduate Student Research Festival, 2006, NIH
- **National MD/PhD Student Conference Diversity Travel Award**, travel award to attend the 2003 national MD/PhD conference, 2003, University of Colorado
- **NASA Pennsylvania Space Grant Consortium Fellowship**, a monetary award for outstanding academic achievement of graduate students with research projects in fields of study that align with the NASA Mission Directorates, 2002, NASA Pennsylvania Space Grant Consortium
- **Harvard College Scholarship**, awarded to members of Harvard College Dean's List, 1998-2001, Harvard College
- **American Chemical Society Scholarship**, monetary award to defray tuition costs, 1997-2001, American Chemical Society
- **International Order of Foresters Scholarship**, monetary award to defray tuition costs, 1997-2001, International Order of Foresters
- **National AP Scholar**, 1997, AP Program
- **Hispanic National Merit Finalist**, 1997, College Board
- **American Vacuum Society Scholarship**, monetary award to defray tuition costs, 1997, American Vacuum Society

### **Memberships in Professional Societies**

- Society of Academic Emergency Medicine
- American Association for the Advancement of Science
- American Chemical Society
- American Physician Scientists Association

### **Other extramural professional activities**

- Associate Scientific Advisor for *Science Translational Medicine*, 2020-2021
- Journal reviewer for *Marine Drugs*, 2020

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- Journal reviewer for *Materials*, 2019
- Journal reviewer for *ACS Applied Materials and Interfaces*, 2019
- Journal reviewer for *Molecular Genetics and Metabolism Reports*, 2019
- Member of the Special Emphasis Panel (SEP) reviewing research proposals submitted to the Centers for Disease Control and Prevention (CDC) under (RFA) CE19-001: *Injury Control Research Centers*, 10/30/18-10/31/18, Atlanta, GA
- Journal reviewer for *Biomedical Microdevices*, 2018-2020
- Journal reviewer for *ACS Nano*, 2017-2018
- Journal reviewer for *Analytical Chemistry*, 2016
- Member of the Special Emphasis Panel (SEP) reviewing research proposals submitted to the Centers for Disease Control and Prevention (CDC) under (RFA) CE14-001: *Grants for Injury Control Research Centers*, 04/2014-04/2016, Atlanta, GA
- Vice President Phi Lambda Upsilon, National Chemistry Honor Society, University of Pittsburgh Chapter, 2006-2007, Pittsburgh, PA

### Invited lectures

- “Diversity and Inclusion in the Academic Workforce: Encouraging Medical Students and Residents to Consider Academic Careers” Plenary session at the *Academic Medicine Career Development Conference*, Rocky Vista University, Ivins, UT 11/1/19
- “Academic Medicine” *University of New Mexico American Medical Student Association Meeting*, Albuquerque, NM 10/1/19
- “Research at the Point of Care,” *UNM MD/PhD Program Translational Science Club*, Albuquerque, NM, 9/17/2019
- “Interstitial Fluid Extraction and Analysis for Wearable Diagnostics,” *Translational Synergy Meeting*, Albuquerque, NM, 11/12/2018
- “Research at the Point of Care,” *UNM MD/PhD Program Translational Science Club*, Albuquerque, NM, 2/20/2018
- “Three Questions” 2016, Commencement Address, *Albuquerque Academy*, Albuquerque, NM, 6/28/2016
- “Point-of-Care Diagnostics; Investigation and Translation,” *University of New Mexico*, Department of Chemical and Biological Engineering, Albuquerque, NM, 12/7/2016
- 2015, “Point-of-Care Testing; Developing Technologies for the ER,” *University of New Mexico*, Department of Chemical and Biological Engineering, Albuquerque, NM, 2/18/2015
- “Point-of-Care Diagnostics; Investigation and Translation,” *Sandia National Laboratories*, Livermore, CA, 9/20/2015
- “Two Cultures,” *University of New Mexico Board of Regents Focus on Faculty presentation*, Albuquerque, NM, 12/4/2014
- “Development of a Rapid, Portable, Point-of-Care Device for Detecting Ethanol Exposure” *Translational Synergy Meeting*, Albuquerque NM, 6/9/2014
- “Power sources, Networks, and Transistors in Medicine,” *Graduation address for American Academy Of Medical Management*, 5/2014
- “Practical Chemistry for Toxicology,” *Boston Children’s Hospital*, Boston, MA, 8/14/2012
- “Clinical Chemistry in Toxicology,” *Boston Children’s Hospital*, Regional Center for Poison Control and Prevention, 7/27/2012

### Community Service

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- **Visiting Scientist**, *Osuna Elementary School Science Fair*, 02/22/2019, Albuquerque, NM
- **Judge**, *Southwest Regional Junior Science & Humanities Symposium*, 02/28/2015, Albuquerque, NM
- **Volunteer**, *Physicians for Social Responsibility*, gun buy-back programs, 2002-2003, Allegheny County, PA
- **Volunteer**, *Harbor Lights Free Clinic and South Side Detox Center and Operation Safety Net*, 2003-2007, Pittsburgh, PA

**Short narrative description of research, teaching and service interests.**

- **Research:** My current research program is broadly focused on the development and testing of point-of-care diagnostics. As a practicing emergency medicine physician with a research background in analytical chemistry, I work with a broad range of clinicians, scientists and engineers to develop, improve, and test new diagnostics and devices.

In the early stages of my career, I focused on developing non-invasive sensors for glucose monitoring and the detection of myocardial ischemia. We used polymer chemistry to develop polymerized crystalline colloidal arrays, which can be adapted to produce a visible color change in response to various analytes. We also used mass spectrometry to understand the metabolism and regulation of glucose in tear fluid. This work has enabled a new field of non-invasive glucose sensing through contact lens-based sensors.

As an associate professor at UNM, I lead a team that has been developing a point-of-care biosensor for the rapid detection of various pathogens including HIV and Ebola Virus. I have also led multi-site FDA regulated device trials, most recently of a breath test for pneumonia caused by urease-producing bacteria. Throughout my career at UNM, I have been actively involved with the Clinical and Translation al Science Center, both as an investigator and representative at national meetings.

In my current position as a CTSC scholar, I am developing microneedle technologies to extract and analyze interstitial fluid. An overarching goal of this project is to develop wearable, minimally invasive sensors to monitor biochemical changes *in vivo*. Our current work in this area also aims to understand the exosome and micro-RNA patterns that are associated with developing chronic pain. We believe that this approach will lead to improved pain control and prevention strategies.

- **Teaching:** My current teaching efforts focus on two areas: clinical education in emergency medicine, and in research methods. In addition to daily clinical teaching of residents and medical students while on duty in the Emergency Department, I have served as a continuity clinic clinical preceptor for several medical students. As a core member of the residency faculty, I work closely with Emergency Medicine residents and lecture regularly in weekly conferences.

I have helped to teach research methods to undergraduate students and to Emergency Medicine residents through regular lectures and workshops. Additionally, I have served as the research mentor for several undergraduate, medical, and graduate students. I have also mentored four resident research projects. Finally, I have collaborated with engineering faculty to teach the Biodesign class BIOM 505 section 005, BME 598 section 003, CBE 499 section 001, CBE 515 section 002, NSMS 595 section 003, ME 561 section 001.

- **Service:** I have worked as an attending physician in the Emergency Departments at the University of New Mexico Hospital and Sandoval Regional Medical Center since 8/2013. I have gained additional qualifications through the department of emergency medicine to work in the Emergency Department Resuscitation Unit. I have contributed to recent trauma center and stroke center accreditations at UNMH.

Additionally, I have worked in underserved emergency departments in rural New Mexico through the UNM Locum Tenens office. I have been an attending physician at Taos Holy Cross Hospital since 9/14 and at Miners Colfax Medical Center (Raton, NM) since 3/15.

With respect to non-clinical service, I have largely focused on pipeline programs to increase the recruitment and retention of underrepresented minorities in medicine and research. I have served on the UNM BA/MD admissions committee for 3 years, organized a regional conference for BNGAP (Building the Next Generation of Academic Physicians) at UNMH, and organized the Summer Undergraduate Research Program for Minority Students at the University Of Pittsburgh School Of Medicine. I was appointed the co-director of the

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UNM MD/PhD program in 3/20 and director of the program in 8/20. Over the last two years, I have served on a committee to help design a new hospital and Emergency Department. I have also served on the search committees for multiple senior leadership positions.

Scholarly achievements:

Original research or scholarly articles in refereed journals:

- Taylor RM, Maharjan D, Moreu F, **Baca JT**, "Parametric study of 3D printed microneedle (MN) holders for interstitial fluid (ISF) extraction," *Microsystem Technologies*, 2020, 26: 2067-2073. (DOI: 10.1007/s00542-020-04758-0)
- O'Sullivan S, Ali Z, Jiang X, Abdolvand R, Ünlü MS, da Silva HP, **Baca JT**, Kim B, Scott S, Sajid MI, Moradian S, Mansoorzare H, Holzinger A, "Developments in transduction, connectivity and AI/machine learning for point-of-care testing," *Sensors (Basel)*, 2019, 19(8): 1917. (PMID: 31018573)
- Miller PR, Moorman M, Boehm RD, Wolfley S, Chavez V, **Baca JT**, Ashley C, Brener I, Narayan RJ, Polsky R, "Fabrication of hollow metal microneedle arrays using a molding and electroplating method," *MRS Advances*, 2019, 4(24): 1417-1426. (DOI: 10.1557/adv.2019.147)
- Femling J, **Baca JT**, "Update on Emerging Infections: News From the Centers for Disease Control and Prevention: Commentary," *Annals of Emergency Medicine*, 2019, 73(1): 25-27. (DOI: 10.1016/j.annemergmed.2018.11.025)
- Miller PR, Taylor RM, Tran BQ, Boyd G, Glaros T, Chavez VH, Krishnakumar R, Sinha A, Poorey K, Williams KP, Branda SS, **Baca JT\***, Polsky R, "Extraction and biomolecular analysis of dermal interstitial fluid collected with hollow microneedles," *Communications Biology* 2018, 1(1): 173, \*co-corresponding (senior) author. (PMID: 30374463)
- Tran BQ, Miller PR, Taylor RM, Boyd G, Mach PM, Rosenzweig CN, **Baca JT**, Polsky R, Glaros T, "Proteomic characterization of dermal interstitial fluid extracted using a novel microneedle-assisted technique," *Journal of Proteome Research*, 2018, 17(1): 479-485. (PMID: 29172549)
- Taylor RM, Miller PR, Ebrahimi P, Polsky R, **Baca JT**, "Minimally-invasive, microneedle-array extraction of interstitial fluid for comprehensive biomedical applications: transcriptomics, proteomics, metabolomics, exosome research, and biomarker identification," *Laboratory Animals*, 2018, 52(5): 526-530. (PMID: 29471723)
- Neuwelt A, Langsjoen J, Byrd T, Eberhardt S, Mlady G, **Baca J**, Blocklage T, Martinez C, Orner J, Rivera M, Sillerud LO, "Ferumoxytol negatively enhances T<sub>2</sub>-weighted MRI of pedal osteomyelitis in vivo," *Journal of Magnetic Resonance Imaging*, 2017, 45(4):1241-1245. (PMID: 27654009)
- Femling JK, **Baca JT**, "Update on Emerging Infections: News From the Centers for Disease Control and Prevention: Commentary," *Annals of Emergency Medicine*, 2016, 68(1): 118-119. (PMID: 27343640)
- Miller PR, Boehm RD, Skoog S, Edwards TL, Rodriguez M, Brozik S, Brener I, Byrd T, **Baca JT**, Ashley C, Narayan RJ, Polsky R, "Electrodeposited iron as a biocompatible material for microneedle fabrication," *Electroanalysis*, 2015, 27(9): 2239-2249. (DOI: 10.1002/elan.201500199)
- **Baca JT**, Severn V, Lovato D, Branch DW, Larson RS, "Rapid detection of Ebola virus with a reagent-free, point-of-care biosensor," *Sensors*, 2015, 15(4): 8605-8614. (PMID: 25875186)
- Wen LS, **Baca JT**, O'Malley P, Bahtia K, Peak D, Takayesu JK, "Implementation of small-group reflection rounds at an emergency medicine residency program," *Canadian Journal of Emergency Medicine*, 2013, 15(3):175-177. (PMID: 23663465)

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- **Baca JT**, Finegold DN, Asher SA, “Progress in developing polymerized crystalline colloidal array sensors for point-of-care detection of myocardial ischemia,” *Analyst*, 2008, 133: 385-390. (PMID:18299754)
- **Baca JT**, Finegold DN, Asher SA, “Tear glucose analysis for the noninvasive detection and monitoring of diabetes mellitus,” *The Ocular Surface*, 2007, 5(4): 280-293. (PMID:17938838)
- **Baca JT**, Taormina CR, Feingold E, Finegold DN, Grabowski JJ, Asher SA, “Mass spectral determination of fasting tear glucose concentrations in nondiabetic volunteers,” *Clinical Chemistry*, 2007, 53(7): 1370-1372. (PMID:17495022)
- Taormina CR, **Baca JT**, Asher SA, Grabowski JJ, Finegold DN, “Analysis of tear glucose concentration with electrospray ionization mass spectrometry,” *Journal of the American Society for Mass Spectrometry*, 2007, 18(2): 332-336. (PMID:17084090)

### Review articles and articles appearing as chapters in edited volumes:

- Larson RS, **Baca JT**, “Versatility of the surface acoustic wave biosensor platform for detecting bacteria and viruses,” Book Chapter in *Global Point of Care: Strategies for Disasters, Emergencies, and Public Health Resilience*, Kost GJ & Curtis CM (Eds.), AACCC Press Inc., Washington, DC, Chapter 15, pp. 165-172, 2014.
- Asher SA, **Baca JT**, “Tear fluid photonic crystal contact lens noninvasive glucose sensors,” Book Chapter in *Handbook of Optical Sensing of Glucose in Biological Fluids and Tissues*, Tuchin VV (Ed.), Taylor and Francis, Inc., Boca Raton, FL, Chapter 13, pp. 387-417, 2009.

### Other writings and scholarly products (not abstracts)

- **Baca JT**, “Aiming the Magic bullet,” *Science Translational Medicine*, 2020, 12(570) DOI: 10.1126/scitranslmed.abf4686
- **Baca JT**, “Therapeutic microbubbles make tumor cells pop” *Science Translational Medicine*, 2020 12(562) DOI: 10.1126/scitranslmed.abe6019
- **Baca JT**, “Stimulated bone growth and metal-infused skeletons: From comic books to commonplace” *Science Translational Medicine*, 2020, 12(554) DOI: 10.1126/scitranslmed.abd3627
- **Baca JT**, “Following the rules to foil Gram-negative infections” *Science Translational Medicine*, 2020, 12(546) DOI: 10.1126/scitranslmed.abc8938
- **Baca JT**, “Nanoreactors get tumor cells hot (but not bothered)” *Science Translational Medicine*, 2020, 12(528) DOI: 10.1126/scitranslmed.abb5666
- **Baca J**, Romer-Leggott V, BNGAP Conference Planning Toolkit (2016), [http://digitalrepository.unm.edu/cgi/viewcontent.cgi?article=1000&context=office\\_for\\_diversity](http://digitalrepository.unm.edu/cgi/viewcontent.cgi?article=1000&context=office_for_diversity)
- **Baca JT**, “Point-of-care sensors for diabetes and myocardial ischemia,” *Doctoral Dissertation*, University of Pittsburgh, Pittsburgh, PA, 2007.
- **Baca JT**, Myers RL, Adams DP, “Microfabrication and Micropatterning with Soft Lithography,” *Sandia Technical Report No. SAND2000-2029C*, Sandia National Laboratories, Albuquerque, NM, 2000.

### Invited or refereed abstracts and/or presentations at professional meetings:

- Parchim N, **Baca JT**, Femling J, Taylor R, Bussman S, Candelaria L, Norii T, Moyer M, Laliberte R, “Preliminary safety evaluation of inhaled <sup>13</sup>C-urea in patients with pneumonia: phase 1, open-label study,” Abstract and poster



- presentation at the *Society of Academic Emergency Medicine Western Regional Conference*, Napa, CA, 03/22/2019.
- Glatz B, Salas C, Grow D, Coffee B, **Baca J**, “Bariatric Lift Prototype,” Abstract and Poster presentation at the *National Association of EMS Physicians Annual Conference*, Austin, TX, 01/10/2019, published in *Prehospital Emergency Care*, 2019, 23(1): 97-152. (PMID: 30221576; DOI: 10.1080/10903127.2018.1521488)
  - **Baca JT**, Taylor RN, Gadam SR, Perez L, “Defining the Extracellular Vesicle Content of Interstitial Fluid for Blood-Free Diagnostics; Extraction Methods and Initial Characterization” Abstract and poster presentation at *Translational Science 2019*, Washington, DC, 03/06/2019.
  - Gallegos M, Patel S, Eberhardt S, Strickler L, Cline-Parhamovich K, Riley J, Lorenzo G, **Baca JT**, “Improving Utilization of Existing Cloud-based Imaging Software in Intra-Hospital Patient Transfers,” Abstract and presentation at *American College of Physicians New Mexico Chapter*, Albuquerque, NM, 11/01/2018.
  - Goslow A, Barkhuff D, Zink PA, Warrick B, Busmann S, **Baca JT**, “Attitudes in a high risk population regarding a naloxone autoinjector capable of detecting acute overdose,” Abstract and Poster presentation at the North American Congress of Clinical Toxicology (NACCT), Chicago, IL, 10/28/2018, published in *Clinical Toxicology*, 2018, 56(10):1018-1019. (DOI: 10.1080/15563650.2018.1506610)
  - Gallegos M, Patel S, Eberhardt S, Strickler L, Cline-Parhamovich K, Riley J, Lorenzo G, **Baca JT**, “Utilization Improvement of Existing Cloud-based Imaging Software in Intra-Hospital Patient Transfers,” *New Mexico Medical Society 2018 Convention*, Albuquerque, NM, 09/14/2018-09/15/2018.
  - **Baca JT**, Taylor RM, Miller PR, Polsky R, “Microneedle-enabled, in vivo exosome extraction from dermal interstitial fluid,” Abstract and poster presentation at *Keystone Symposia on Molecular and Cellular Biology-Exosomes/Microvesicles: Heterogeneity, Biogenesis, Function and Therapeutic Developments*; Breckenridge, CO, 06/04/2018-06/08/2018.
  - Taylor R, Branda S, Krishnakumar R, Williams K, Kanagy N, Miller P, Polsky R, **Baca J**, “RNA signatures of hypoxia exposure: minimally invasive monitoring through interstitial fluid biomarkers,” Poster presentation at *Chemical and Biological Defense Science & Technology (CBD S&T) Conference*; Long Beach, CA, 11/2017.
  - **Baca JT**, “Microneedle technologies for wearable sensors and interstitial fluid analysis,” Invited Speaker at *American Association of Pharmaceutical Scientists Rocky Mountain Discussion Group*; Albuquerque, NM, 09/2017.
  - Musleh A, Culbreath K, **Baca J**, “Using antimicrobial films on stethoscopes to reduce bacterial colony counts,” Abstract and Poster presentation at *SAEM*, New Orleans, LA, 05/10/2016-05/13/2016, published in *Academic Emergency Medicine*, 2016, 23(S1): S239.
  - **Baca JT**, Severns V, Lovato D, Larson RS, “Shear horizontal surface acoustic wave sensors for rapid detection of enterohemorrhagic Escherichia coli,” Abstract and oral presentation at *6th International Conference and Exhibition on Biosensors & Bioelectronics*, Phoenix, AZ, 09/22/2016-09/24/2016, published in *Journal of Biosensors and Bioelectronics*, 2016, 7:3(Suppl):28. (DOI: 10.4172/2155-6210.C1.030)
  - Neuwelt A, Rivera M, Orner J, Byrd T, Sillerud L, Mlady G, **Baca J**, Langsjoen J, “Ferumoxytol-contrasted MRI for macrophage imaging of inflammation in human osteomyelitis, a feasibility study,” Abstract at *57<sup>th</sup> American Society of*

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*Hematology Blood Annual Meeting and Exposition*, Orlando, FL, 12/05/2015-12/08/2015, published in *Blood*, 2015, 126(123):1016.

- **Baca, JT**, Severns V, Adams SF, Larson RS, "Point-of-care tumor marker detection in ovarian cancer," Poster presentation at *Center for Future Technologies in Cancer Care Symposium*, Boston, MA, 05/2014.
- **Baca JT**, Finegold DN, Asher SA, "photonic crystal sensors for the rapid detection of myocardial ischemia," Plenary talk at *American Society of Mechanical Engineers, Summer Bioengineering Conference*, Keystone, CO, 06/21/2007-06/23/2007.
- **Baca JT**, Taormina CR, Finegold DN, Grabowski JJ, Asher SA, "Photonic crystal sensors for point of care monitoring of acute and chronic disease states," Poster presented at the *NIH National Graduate Student Research Festival*, Bethesda, MD, 10/12/2006-10/13/2006.
- **Baca JT**, Taormina CR, Finegold DN, Grabowski JJ, Asher SA, "Tear glucose determination for the development of a non-invasive glucose sensor," Abstract and poster presentation at *232nd ACS National Meeting*, San Francisco, CA, 09/10/2006-09/14/2006.
- **Baca JT**, Finegold DN, Taormina CR, Grabowski JJ, Asher SA, "Determining the levels of glucose in tear fluid: motivating a non-invasive glucose sensor," Poster presented at the *American Society for Clinical Investigation / Association of American Physicians 2006 Joint Meeting*, Chicago, IL, 04/28/2006-04/30/2006.
- **Baca JT**, Taormina CR, Feingold E, Finegold DN, Grabowski JJ, Asher SA, "Determining the levels of glucose in tear fluid: motivating a non-invasive glucose sensor," Plenary talk at *56th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy*, Orlando, FL, 03/03/2005.
- **Baca JT**, Finegold DN, Taormina CR, Grabowski JJ, Somayajula K, Asher SA, "Determining the levels of glucose in tear fluid: motivating a non-invasive glucose sensor," Abstract and poster presentation at *Fourth Annual Diabetes Technology Meeting*, Philadelphia, PA, 10/28/2004-10/30/2004, published in *Diabetes Technology and Therapeutics*, 2005, 7(2): 364.
- **Baca JT**, Finegold DN, Taormina CR, Grabowski JJ, Somayajula K, Asher SA, "Glucose quantitation in tear fluid: steps toward non-invasive glucose monitoring," Abstract and poster presentation at *Gordon Research Conference: Bioanalytical Sensors*, Queens' College, Oxford, England, 07/04/2004-07/09/2004.

### **Contributed (unrefereed) abstracts and/or oral presentations at professional meetings:**

- **Baca JT**, Chen X, Reisner A, "Vital Sign Quality during Critical Care Transport" BWH/MGH HAEMR Senior Project Day, Harvard Medical School, Boston MA, 04/26/2013.
- **Baca JT**, Shtrahman M, Fiore D, Wu XL, "Synthesis and characterization of CdSe quantum dots for biological applications," Abstract and poster presentation at *18<sup>th</sup> National Student MD/PhD Conference*, Snowmass, CO, 07/11/2003-07/13/2003.
- **Baca JT**, Myers RL, Adams DP, "Microfabrication and micropatterning with soft lithography," Plenary talk at *Student Internship Program Symposium*, Albuquerque, NM, 2000.
- **Baca JT**, Kenis PJA, Whitesides GM, "Using soft lithography to construct heat exchange devices and microfluidic detectors for biological species," Plenary talk

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at *Materials Science REU Symposium*, Harvard University, Cambridge, MA, 1999.

### Works in progress:

#### Original research or scholarly articles in refereed journals:

- **Baca JT**, Parchim NF, Femling J, Taylor RM, Bussmann S, Candelaria L, Norii T, Moyer M Laliberte R, Patel S, Nowak R, “Feasibility and Safety evaluation of inhaled 13C-urea in patients with pneumonia” Under review at *Journal of Clinical Medicine*
- Goslow A, Warrick JB, Barkhuff D, Zink PA, Bussman S, **Baca JT**, “Attitudes In a High Risk Population Regarding a Naloxone Autoinjector Capable of Detecting Acute Overdose” Submitted to *Journal of Addiction Medicine*
- Taylor RM, **Baca JT**, “Interstitial fluid analysis in a model of ketosis to enable a wearable ketone sensor” (manuscript in preparation)
- Taylor RM, Perez L, Gadam SR, **Baca JT**, “Exosome isolation and analysis in dermal interstitial fluid” (manuscript in preparation)

### Invention disclosures:

- STC No. 2015-051, “In-Vivo Extraction of Interstitial Fluid Using Hollow Microneedles,” U.S. Provisional Application No. 62/144,545 (expired); U.S. Patent Application No. 15/078,870 (filed); International Patent Application No. PCT/US16/24747 (expired)
- STC No. 2017-017, “Device and Method for Interstitial Fluid Extraction,” U.S. Patent Application No. 15/913,629 (filed)
- STC No. 2017-038, “Wearable Auto Injector,” U.S. Provisional Application No. 62/434,882 (expired); U.S. Provisional Application No. 62/599,286 (expired); International Application No. PCT/US18/55506 (filed)
- STC No. 2017-067, “Device and Method for Interstitial Fluid Extraction,” U.S. Provisional Application No. 62/468,505 (closed)
- STC No. 2017-071, “Optically Transparent Temporary Splints,” U.S. Provisional Application No. 62/532,957 (expired); U.S. Provisional Application No. 62/698,676 (filed)
- STC No. 2017-098, “Method to Quantify Exosome Concentration,” U.S. Provisional Application No. 62/547,980 (expired); U.S. Provisional Application No. 62/721,908 (filed)
- STC No. 2018-003, “Color Changing Detection Patch Utilizing Microneedle Sampling of Interstitial Fluid,” U.S. Provisional Application No. 62/555,721 (expired); U.S. Provisional Application No. 62/728,935 (filed)
- STC No. 2018-042, “Mild Traumatic Brain Injury Diagnostic Immunochromatographic Microneedle Patch,” U.S. Provisional Application No. 62/597,010 (filed); International patent application (pending)
- STC No. 2018-071, “Bariatric Lift Assist Device,” U.S. Provisional Application No. 62/641,179 (filed)
- STC No. 2018-079, “Coaxial Microneedle Electrochemical Sensor,” U.S. Provisional Application (pending)
- STC No. 2019-018, “Needle Guard Tip Designs for Microneedle Holders Utilized for Interstitial Fluid Extraction,” U.S. Provisional Application No. 62/740,777 (filed)

**Grant and Contract Funding:**

- **Current Grant and Contract Funding:**
  - Project Title: Defining microRNA signatures in the development and modulation of chronic pain
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 75
  - Funding organization: NIH grant KL2TR001448, through UNM CTSC
  - Starting and stopping dates: 04/2018-04/2021
  - Amount awarded for the period listed (direct cost and indirect costs): \$300,000
  
  - Project Title: Development and Testing of a Surface Acoustic Wave Analytical System
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 10%
  - Funding organization: Sensor-Kinesis Corporation
  - Starting and stopping dates: 03/01/2020-02/28/2021
  - Amount awarded for the period listed (direct cost and indirect costs): \$150,179
  
  - Project Title: Quantifying Heavy Metals in Interstitial Fluid for Remote Monitoring of Chronic Exposures
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1
  - Funding organization: NIH grant R03DS031724
  - Starting and stopping dates: 10/2020-9/2022
  - Amount awarded for the period listed (direct cost and indirect costs):
  
  - Project Title: COVID19- AMDI-Autolab-20-01
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1%
  - Funding organization: Autonomous Medical Devices Inc. (AMDI)
  - Starting and stopping dates: 08/25/2020-08/24/2021
  - Amount awarded for the period listed (direct cost and indirect costs): \$159,219
  
  - Project Title: CRISIS COVID Clinical Trial
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1%
  - Funding organization: Clear Creek Bio Inc.
  - Starting and stopping dates: 10/02/2020-10/01/2021
  - Amount awarded for the period listed (direct cost and indirect costs): \$129,115
  
  - Project Title: Access Natriuretic Peptide Assay(s) ED Pivotal – Subject Enrollment and Specimen Collection

## Justin T. Baca MD PhD, Curriculum Vitae

- Principal investigator: **Justin T. Baca**
  - Percent effort: 1%
  - Funding organization: Beckman Coulter Inc.
  - Starting and stopping dates: 08/11/2020-08/10/2024
  - Amount awarded for the period listed (direct cost and indirect costs): \$357,120
- **Past Grant and Contract Funding**
    - Project Title: Critical Care Intelligent Insights
    - Principal investigators J. Humberto Morales-Loredo and **Justin T. Baca**
    - Percent effort: NA
    - Funding organization: ISF through Lobo Rainforest I-Corps
    - Starting and stopping dates: 09/2020-12/2020
    - Amount awarded for the period listed (direct cost and indirect costs): \$3,000
  - Project Title: Quantifying the Metabolomic Profile of Interstitial Fluid for Health Monitoring
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1%
  - Funding organization: NIH through UNM CTSC
  - Starting and stopping dates: 10/01/2019-9/30/2020
  - Amount awarded for the period listed (direct cost and indirect costs): \$24,982
- Project Title: Clinical Evaluation of I-STAT Ctni Nxg Test to Aid in the Diagnosis of Myocardial Infarction (MI)
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1
  - Funding organization: Abbott POC
  - Starting and stopping dates: 06/26/2019-06/25/2020 (study terminated early by sponsor)
  - Amount awarded for the period listed (direct cost and indirect costs): \$490,410
- Project Title: Clinical Evaluation for i-STAT PTplus/aPTT Cartridge for APTT in Subjects Receiving Heparin Therapy
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1
  - Funding organization: Abbott POC
  - Proposed dates: 10/30/2018-10/29/2019
  - Amount awarded for the period listed (direct cost and indirect costs): \$81,316
- Project Title: Clinical Evaluation of the I-STAT Ionized Calcium and Lactate Tests in Venous and Arterial Specimens
  - Principal investigator: **Justin T. Baca**
  - Percent effort: 1
  - Funding organization: Abbott POC

## Justin T. Baca MD PhD, Curriculum Vitae

- Starting and stopping dates: 12/17/2018-12/16/2019
- Amount awarded for the period listed (direct cost and indirect costs): \$140,848
  
- Project Title: C-urea Breath Test for the detection of urease producing bacteria in patients diagnosed with pneumonia
- Principal investigator: **Justin T. Baca**
- Percent effort: 1-10%
- Funding organization: AVISA Pharma Inc.
- Starting and stopping dates: 10/01/2016-09/30/2019
- Amount awarded for the period listed (direct cost and indirect costs): \$117,323
  
- Project Title: PRedictive InterStitial fluid Markers for early diagnosis (PRISM)
- Principal investigator: Michelle Maughan
- Percent effort: 1
- Funding organization: Defense Threat Reduction Agency
- Starting and stopping dates: 10/2017-09/2020
- Amount awarded for the period listed (direct cost and indirect costs): \$74,977
  
- Project Title: Clinical Evaluation of the I-STAT System for Hematocrit in Venous and Arterial Specimens
- Principal investigator: **Justin T. Baca**
- Percent effort: 1
- Funding organization: Abbott POC
- Starting and stopping dates: 10/05/2018-03/31/2019
- Amount awarded for the period listed (direct cost and indirect costs): \$85,296
  
- Project Title: Blood collection from patients presenting with suspected new onset or exacerbated heart failure
- Principal investigator: **Justin T. Baca**
- Percent effort: 1%
- Funding organization: Fujirebio Inc.
- Starting and stopping dates: 02/01/2018-01/31/2019
- Amount awarded for the period listed (direct cost and indirect costs): \$129,897
  
- Project Title: Development of an On-Body Microneedle Sensor Platform for Transdermal Monitoring of Physiological Markers
- Principal investigator(s) as listed on title page: Ronen Polsky
- Percent effort: 1-25
- Funding organization: Defense Threat Reduction Agency
- Starting and stopping dates: 10/2015-09/2018
- Amount awarded for the period listed (direct cost and indirect costs): \$1,600,336

## Justin T. Baca MD PhD, Curriculum Vitae

- Project Title: A Wearable, Rapid Interstitial Fluid Sensor for Ketones
- Principal investigator: **Justin T. Baca**
- Percent effort: NA
- Funding organization: Research Allocation Committee, University of New Mexico School of Medicine
- Starting and stopping dates: 11/2017-10/2018
- Amount awarded for the period listed (direct cost and indirect costs): \$24,940
  
- Project Title: Method for opioid overdose prevention
- Principal investigator: **Justin T. Baca**
- Percent effort: NA
- Funding organization: ISF through Lobo Rainforest I-Corps
- Starting and stopping dates: 09/2018-01/2019
- Amount awarded for the period listed (direct cost and indirect costs): \$3,000
  
- Project Title: Feasibility and acceptability study of a wearable naloxone autoinjector
- Principal investigator: Daniel Barkhuff
- Percent effort: NA
- Funding organization: Valente Foundation
- Starting and stopping dates: 02/2017-01/2019
- Amount awarded for the period listed (direct costs and indirect costs): \$3,000
  
- Project Title: Prototype Lift to improve bariatric transport; Banana Lift System
- Principal investigator: **Justin T. Baca**
- Percent effort: 1
- Funding organization: Valente Foundation
- Starting and stopping dates: 02/2017-01/2019
- Amount awarded for the period listed (direct costs and indirect costs): \$2,000
  
- Project Title: Real-time data collection through wearable devices to quantify attributes related to health and performance in extreme conditions
- Principal investigator: Glory Avina, Jon Femling
- Percent effort: NA
- Funding organization: Defense Threat Reduction Agency
- Starting and stopping dates: 10/2016-09/2019
- Amount awarded for the period listed (direct costs and indirect costs): \$2.38M
- Brief description: This grant funded the study of wearable devices in subjects crossing the Grand Canyon in a single day.
  
- Project Title: Banana Lift System for Bariatric Transport
- Principal investigator: **Justin T. Baca**

## Justin T. Baca MD PhD, Curriculum Vitae

- Percent effort: NA
  - Funding organization: UNM CTSC
  - Starting and stopping dates: 04/01/2017-03/31/2018
  - Amount awarded for the period listed (direct costs and indirect costs): \$11,200
  - Brief description: This grant funded further development of a bariatric lift system that was conceived as part of the UNM Biodesign class.
- 
- Project Title: SAW Sensor Technology
  - Principal investigator(s): Richard Larson
  - Percent effort: 10
  - Funding organization: Pharmaco-Kinesis Corporation
  - Starting and stopping dates: 03/2016-10/2016
  - Amount awarded for the period listed (direct costs and indirect costs):
  - Brief description: This industry funded contract supports advanced development of SAW Sensor Technology for pathogenic bacteria in food.
- 
- Project Title: Point-of-Care Tumor Marker Detection for Germ Cell and Epithelial Ovarian Tumors in Rural Environments
  - Principal investigator(s): **Justin T. Baca**
  - Percent effort: 5
  - Funding organization: NIH through the Center for Future Technologies in Cancer Care
  - Starting and stopping dates: 06/01/2014-05/31/2015
  - Amount awarded for the period listed (direct costs and indirect costs): \$75,500
  - Brief description: This grant supported the development of an acoustic wave sensor for the rapid detection of ovarian cancer tumor markers.
- 
- Project Title: Use of Antimicrobial Films to Reduce of Bacterial Counts on Commonly Used Surfaces in the Emergency Department
  - Principal investigator(s): **Justin T. Baca**
  - Percent effort: NA
  - Funding organization: Valente Foundation
  - Starting and stopping dates: 01/2014-12/2015
  - Amount awarded for the period listed (direct costs and indirect costs): \$3,000
  - Brief description: This grant supported a pilot project to determine the feasibility of using antimicrobial films to decrease bacterial contamination of commonly touched surfaces in the Emergency Department.
- 
- Project Title: Clinical Trial to Validate Use of Nanoparticles in clinical imaging
  - Principal investigator(s): Richard Larson, **Justin T. Baca**
  - Percent effort: 10
  - Funding organization: Senior Scientific LLC
  - Starting and stopping dates: 10/01/2013-11/30/2014
  - Amount awarded for the period listed (direct costs and indirect costs): \$1.35M



## Justin T. Baca MD PhD, Curriculum Vitae

- Brief description: This industry-funded contract supported development of clinical applications for magnetic nanoparticles to enable improved localization and detection of tumors.
  
- Project Title: Ruth L. Kirschstein National Research Service Award Individual Fellowship, NIH grant R31 EB004181-01A
- Principal investigator(s), as listed on title page: **Justin T. Baca**
- Percent effort: 100
- Funding organization: NIH
- Starting and stopping dates: 2005-2007
- Amount awarded for the period listed (direct costs and indirect costs): \$80,271
- Brief description: This grant supported my doctoral research on the development of point-of-care sensors for the management of diabetes and myocardial ischemia.
  
- Project Title: NASA Pennsylvania Space Grant Consortium Fellowship
- Principal investigator(s), as listed on title page: **Justin T. Baca**
- Percent effort: 100
- Funding organization: NASA Pennsylvania Space Grant Consortium
- Starting and stopping dates: 2002
- Amount awarded for the period listed (direct costs and indirect costs): \$3,000
- Brief description: This grant supported my work on the development of CdSe quantum dots for the non-invasive imaging of neuronal action potentials.
  
- Project Title: Medical Scientist Training Program Grant Scholarship, NIH grant T32 GM08208
- Principal investigator(s), as listed on title page: Clayton A. Wiley
- Percent effort: 100
- Funding organization: NIH
- Starting and stopping dates: 2001-2003
- Amount awarded for the period listed (direct costs and indirect costs): \$479,254
- Brief description: This grant supported my first two years of MSTP training and my summer research rotations in the Wu and Asher labs. This involved work on the development of CdSe quantum dots for the non-invasive imaging of neuronal action potentials, and work on the development of polycrystalline colloidal arrays for the detection of glucose.
  
- Project Title: Material Research Experience for Undergraduates Program
- Principal investigator(s), as listed on title page: **Justin T. Baca**
- Percent effort: 100
- Funding organization: Harvard University
- Starting and stopping dates: 1999
- Amount awarded for the period listed (direct costs and indirect costs): \$2,000
- Brief description: This grant supported the development of a new fabrication method to produce heat exchange devices.

## Justin T. Baca MD PhD, Curriculum Vitae

- Project Title: Harvard College Research Program
  - Principal investigator(s), as listed on title page: **Justin T. Baca**
  - Percent effort: 25
  - Funding organization: Harvard University
  - Starting and stopping dates: 1998-2001
  - Amount awarded for the period listed (direct costs and indirect costs): \$3,000
  - Brief description: This grant supported the development of a portable microfluidic detector by using multistream laminar flow patterning to create arrays of self-assembled monolayers for rapid detection of pathogens.
- **Pending Grant and Contract Funding (proposals submitted):**
    - Project Title: Rapid Alcohol Detection and Monitoring in Dermal Interstitial Fluid
    - Principal investigator: **Justin T. Baca** and Duncan McClure
    - Percent effort: 3
    - Funding organization: NIH
    - Proposed dates: 4/2020-9/2022
    - Proposed amounts: \$148,296
    - Status of review: assigned to review committee

## **Justin T. Baca MD PhD, Curriculum Vitae**

### **Mentoring of other faculty in research or scholarship.**

- Daniel Barkhuff (Assistant Professor), 2016-Present, research mentor for study of a wearable naloxone autoinjector, outcomes include a seed grant award for initial study (Valente Foundation), a filed provisional patent, and an accepted abstract at a national meeting
- Tatsuya Norii (Assistant Professor), 2017-Present, advised and collaborated on development of transparent splinting materials, outcomes include a filed provisional patent
- Margaret Greenwood-Ericksen (Assistant Professor), 2017-Present, assisted in transition to new faculty research role at UNM. Specifically advised on grant applications and made introductions to current UNM researchers in population health.
- Silas Bussmann (Lecturer III), 2016-Present, assisted in development and teaching of Research in Acute Care Course, and assisted in developing and launching a staff research network.

## Teaching / Education

- **Post-doctoral student mentoring.**
  - J Humberto Morales-Loredo, Critical Care Intelligent Insights, 9/20-12/20, successful funding of iCORPs project
  - Robert Taylor, Clinical and Animal studies of microneedles to enable wearable sensing technologies, 08/2016-06/2018, 2 published manuscripts and 1 accepted manuscript
  
- **Graduate student mentoring.**
  - Srinivasa Rao Gadam, 10/2018-Present, microRNA signatures of acute neuritis and toxic metal exposure, PhD expected 5/2021
  - Dilendra Maharjan, 10/2018-Present, Development of a wearable sensor for biomedical applications, MS 12/2019
  - Andrew Duff, 10/2018-06/2019, Design and Characterization of Novel Robotic Mechanisms for Applications in Prosthetics and Biomechanics, successfully defended MS thesis on 04/26/19, currently employed by Sandia National Laboratories as research staff.
  - Sergio Torres, 04/2017-08/2017, Animal studies of microneedles for enhanced toxicology methods, completed laboratory rotation
  - Parwana Ebrahimi, 05/2017-12/2017, Characterization of microneedle and tissue interactions, completed laboratory rotation
  - Amir Faraji, 06/2005-08/2005, Mentored Analytical Chemistry lab rotation for MSTP (MD/PhD) student, completed rotation with presentation at local conference, currently a Neurological Surgery resident
  
- **Undergraduate medical student mentoring.**
  - Lionel Candelaria, 7/2019-present, Multiple research projects including paid Molecular Identification of Covid-19 Infected People via Runtime Breath Analysis, outcomes include successful grant application
  - Sumit Patel, 06/2018-11/2018, Utilization Improvement of Existing Cloud-based Imaging Software in Inter-Hospital Patient Transfers, outcomes included a poster presentation at American College of Physicians NM chapter meeting 11/1/2018
  - Martha Gallegos, 06/2018-10/2018, Utilization Improvement of Existing Cloud-based Imaging Software in Inter-Hospital Patient Transfers, outcomes included a poster presentation at the New Mexico Medical Society conference 9/15/2018
  - Thomas Byrd, 08/2013-05/2016, Initial clinical studies of multiplexed microneedles, and clinical trial for Ferumoxytol as a contrast agent to enhance the detection of osteomyelitis, outcomes included a published manuscript
  
- **Pre-baccalaureate student and honors student mentoring.**
  - Jesus Fuentes 2/20-Present (>20 contact hours), Introduction to emergency medicine, provided clinical shadowing experiences and career mentoring
  - Anne Scripsick, 7/2018-Present (>80 contact hours). Introduction to emergency medicine and research in the acute care setting. Extensive career mentoring and supervised on multiple clinical research projects.
  - Lauren Perez, 7/2018-Present (>120 contact hours), Characterization of exosomes in interstitial fluid, ongoing summer laboratory project

## Justin T. Baca MD PhD, Curriculum Vitae

- Cody Moezzi, 1/2018-6/2019 (>80 contact hours), Mentored I-CORPs NSF innovation project, introduction to emergency medicine through shadowing experience, extensive individual meetings on research opportunities and career planning, outcomes include successful transition into BA/MD program at UNM
- Monica Renfro, 6/2017-Present (>40 contact hours), Introduction to emergency medicine and research in the acute care setting, extensive career mentoring, outcomes include successful placement in an undergraduate research experience and decision to apply for medical school
- Jacob Osborne, 2/2019-Present (>20 contact hours), discussed career goals, provided clinical shadowing experience, assisted with resources to develop undergraduate research experience
- Jonathan Haase, 06/2016-08/2016 and 05/2019-present (>200 contact hours), Characterizing surface properties of microneedles for enhanced bio fluid transport, outcome included development of laboratory writing skills and submission of final report, subsequently advised on application to medical school and provided clinical shadowing experience
- Christopher Hunter, 6/2018-7/2019 (~30 contact hours), Extensive career mentoring in MD/PhD careers, advised on application to Medical Scientist Training Programs, and provided clinical shadowing experience
- Sarah Park, 01/2017-08/2017 (~10 contact hours), Extensive career mentoring, outcomes include successful application and matriculation in pharmacy school at UNM
- Andrew Gutierrez, 11/2014-01/2018 (~20 contact hours), Extensive career mentoring and clinical shadowing, outcomes include successful application and matriculation into MSTP (MD/PhD) program at University of Pittsburgh
- Velia Moran (Williams College), 01/2015 (>20 contact hours a week and >80 hours total for an Emergency Medicine Emersion experience), Outcomes included clinical shadowing, emergency medicine didactics, and evaluation of written projects
- Briann Fink, 06/2007-02/2008 (>200 contact hours), Mentored Undergraduate Research project on Polymerized Crystalline Colloidal Arrays for Heavy Metal Sensing, completion of mentored research project, successful employment as a patent examiner for USPTO
- Uchechi Anumundu, 06/2006-08/2006 (>300 contact hours), Summer Undergraduate Research Program for Underrepresented Students, completed summer project, presented results at national conference (SACNAS, 10/2006, Tampa, FL)
- Gretchen Allison, 05/2005-05/2006 (>200 contact hours), Mentored chemistry research project for 2 semesters and advised in application to osteopathic medical schools
- Matthew Meisel, 6/2005-8/2005 (>200 contact hours), Mentored summer research project in analytical chemistry, currently Chief Financial Officer Little Leaf Farms, Devens, MA
- **Classroom, laboratory teaching, and tutoring (courses or blocks taught or team-taught):**
  - 2020: Diagnostic Test Engineering, contributed 2 guest lectures on "Point-of-Care SARS-CoV-2 detection tests." Graduate credit: BME 598

## Justin T. Baca MD PhD, Curriculum Vitae

- section 004, NSME 595 section 004, CBE 515 section 007, PHRM 598 section 015, Undergraduate credit: CBE 499 section 004, Course Director Scott Sibbett
- 2019: Adaptable design for the community: a physician scientist's perspective on engineering in the clinical setting, guest lecture for engineering students
  - 2018: Cultures of New Mexico; orientation lecture for Emergency Medicine interns, Fellows, and Physician assistants
  - 2018: Research Regulated; lecture providing an overview of clinical research regulations for Emergency Medicine Resident Research curriculum
  - 07/2017-06/2018: Emergency Medicine Resident research curriculum group leader
  - 2017: Evidence Based Medicine, Studies on Therapy; Resident lecture
  - 2017: HO2 research presentations session chair and commentator
  - 2017: Cultures of New Mexico; orientation lecture for Emergency Medicine interns, Fellows, and Physician assistants
  - 2016: Point of care Diagnostics, Investigation and Translation; CBME seminar
  - 2016: Systematic Reviews; Resident lecture
  - Biodesign (BIOM 505 section 005, BME 598 section 003, CBE 499 section 001, CBE 515 section 002, NSMS 595 section 003, ME 561 section 001), Biodesign course to introduce engineering students to the process of innovating medical technologies
  - 2016: Interprofessional Disaster Preparedness Event, Group Facilitator
  - 2015: Point of care Testing, Developing Technologies for the ER; CBME seminar
  - 2014: Pulmonary Embolism, Pneumothorax, and Pneumonia; Resident Lecture
  - 2013: "Boston 4/15/13," Lecture to Disaster Medicine class on the Boston Marathon Bombing
  - 2010-2013: "Toxicology and Endocrine Emergencies," Pro-EMS, Cambridge, MA; 20; instructor for 4 number of sessions
  - 2009: "Introduction to Physical Exam," University of Pittsburgh School of Medicine, Pittsburgh, PA; instructor for 4 sessions
  - 1999-2001: 4 semesters, "Multivariable Calculus and Linear Algebra," Harvard University, Department of Mathematics, Cambridge, MA; 35; Course Assistant for 60 sessions
- **Resident and fellow teaching and mentoring**
    - Nicholas Parchim, 11/2016-Present, *Urease breath test for rapid diagnosis of bacterial pneumonia*, manuscript in preparation
    - Bethany Glatz, 02/2017-06/2019, *Prototype Lift to improve bariatric transport; Banana Lift System*, outcomes include anticipated manuscript publication and presentation at national conference
    - Amjad Musleh, 10/2013-06/2015, *Use of antimicrobial films to reduce bacterial counts on commonly used surfaces in the emergency department*, outcomes included submission of HRPO protocol, obtained initial grant funding, published meeting abstract, and presentation at national conference

## Justin T. Baca MD PhD, Curriculum Vitae

- Derek Stadie, 11/2013-06/2015, *Does use of point-of-care troponin testing decrease time to anticoagulation in NSTEMI?*, outcomes included an approved HRPO protocol and presentation of results at a local conference
- **Curriculum development or educational administrative positions**
  - Director, MD/PhD program, University of New Mexico, Albuquerque, NM; 8/2020-Present
  - *Co-director*, MD/PhD program, University of New Mexico, Albuquerque, NM; 3/2020-7/2020
  - *Committee Member*, BA/MD Admissions committee, University of New Mexico, Albuquerque, NM; 2014-Present
  - *Committee Member*, MD/PhD Admissions committee, University of New Mexico, Albuquerque, NM; 2017-Present
  - *Selected Participant*, UNM Medical Leadership Academy, University of New Mexico Health System, Albuquerque, NM; 2016-2018
  - *Committee Member*, Building the Next Generation of Academic Physicians (BNGAP) Regional Conference Executive Planning Committee, University of New Mexico, Albuquerque, NM; 2015-2016
  - *Leadership Council*, Office of Multicultural Careers, Brigham and Women's Hospital, Boston, MA; member of advisory council on multicultural affairs; 2010-2013
  - *Chair*, Medical Scientist Training Program student committees, University of Pittsburgh School of Medicine, Pittsburgh, PA; chair of student committees for a 70 student MSTP—represented program at national meetings, ran weekly committee meetings, organized student activities, served as student representative of program in administrative meetings; 2007-2008
  - *Chair and laboratory mentor*, Summer Undergraduate Research Program for Minority Students, University of Pittsburgh School of Medicine, Pittsburgh, PA; 2006-2009
  - *Vice President*, Phi Lambda Upsilon, National Chemistry Honor Society, University of Pittsburgh, Pittsburgh, PA; 2006-2007
  - *Student Chair*, Summer Undergraduate Research Program for Minority Students, University of Pittsburgh School of Medicine, Pittsburgh, PA; 2004-2006
  - *Committee Member*, LCME Accreditation Self-Study Committee- Basic Science Research, University of Pittsburgh School of Medicine, Pittsburgh, PA; 2002-2003
  - *Committee Member*, Admissions Committee, University of Pittsburgh School of Medicine, Pittsburgh, PA; 2001-2008
  - *Elected Student Representative*, UPSOM Curriculum Committee, University of Pittsburgh School of Medicine, Pittsburgh, PA; 2001-2006

## Justin T. Baca MD PhD, Curriculum Vitae

### Service

- **Present patient care activities**
  - Attending Physician, Emergency Medicine, University of New Mexico Hospital, 08/2013-Present
  - Attending Physician, Emergency Medicine, Sandoval Regional Medical Center 08/2013-Present
  - Attending Physician, Emergency Medicine, Taos Holy Cross Hospital, 09/2014-Present
  - Attending Physician, Emergency Medicine, Miners Colfax Medical Center, 03/2015-Present
- **Past patient care activities**
  - Resident Physician, Emergency Medicine, Harvard Affiliated Emergency Medicine Residency, Brigham & Women's Hospital, 07/2009-06/2013
  - Resident Physician, Emergency Medicine, Harvard Affiliated Emergency Medicine Residency, Massachusetts General Hospital, 07/2009-06/2013
- **University, SOM, HSC administrative duties**
  - 2014-Present, BA/MD Admissions Committee Member
  - 2017-Present, MD/PhD Admissions Committee Member
  - 2018-2019, Geriatrics Center of Excellence Planning Committee
- **University, SOM, HSC, department committees**
  - 10/2018-Present Integrating Special Populations Committee for the UNM Clinical and Translational Science Center
  - 2015-Present, Core Faculty Member, Emergency Medicine Residency
  - 2020 Search committee member for position of Chief Medical Investigator
  - 2020 Search committee member for position of HSLIC Executive Director
  - 2019 Search committee member for position of Chief Medical Investigator
  - 07/2017-06/2018, Emergency Medicine Residency Research Committee, Member
  - 11/2017, Strategic planning committee for Biomedical Sciences Graduate Program (BSGP), focusing on Research Education Programs