# Appendix A

# Workforce Analysis Request Form

# Workforce Analysis Request Form

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| Directions: An institution shall use this form to request workforce data analysis of a proposed degree program. In completing the form, the institution should refer to the document AHECB Policy 5.11 [Approval of New Degree Programs and Units](https://static.ark.org/eeuploads/adhe/New_Academic_Programs.pdf)*,* which prescribes specific requirements for new degree programs*.* **Note:** This form is required to be submitted by the Chief Academic Officer or individual(s) they designate. Answers need not be confined to the space allotted but may extend to several pages. |

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| **Program Information for Analysis** |
| 1. Institution: University of Arkansas-Fayetteville |
| 2. Program Name – Show how the program would appear on the Coordinating Board’s program inven- tory (*e.g., Bachelor of Business Administration or Associate of Science in Accounting*):  Master of Arts in Interdisciplinary Studies |
| 3. Proposed CIP Code: If the proposed program does not fit easily into one [CIP Code,](https://nces.ed.gov/ipeds/cipcode/) provide the code it most closely falls into and explain differences / nuances of your program  30.0000, Multi-/Interdisciplinary Studies, General |
| 4a. Standard Occupational Classification (SOC) from CIP-SOC Crosswalk:  Take SOC codes from NCES Crosswalk of CIP to SOC, ranked in order of relevance (i.e., the degree to which program graduates are expected to desire and/or be qualified to work in each occupation) **(See CIP-SOC Matching & NCES Crosswalk)**  **~**No Match between CIP and SOC found in crosswalk |
| 4b. Standard Occupational Classification (SOC) from Expert/Staff Opinion (optional): If you think the standard NCES crosswalk accurately represents the list of occupations in which graduates of the pro- posed program will be qualified to work, leave this blank. If you think the list of target occupations is longer, shorter, or different, please provide an alternative list here, ranked in order of relevance. Feel free to add qualitative information about the variety of jobs and pay scales that may exist within target oc- cupations, and where you expect graduates to fit in. **(See CIP-SOC Matching & NCES Crosswalk)**  Benchmarking reports from UA-Global Campus indicate that the top occupation of graduates from graduate programs in interdisciplinary studies are ranked in order, postsecondary teachers, general and operations managers, management analysts, project management specialists and business operations specialists, retail salespersons, personal service managers, first line supervisors of office and administrative support workers, customer service representatives, and financial managers. |
| 5. Brief Program Description – Describe the proposed program, the costs and investments involved in implementing it, the students you expect to recruit into it, and its educational objectives.  The Master of Arts in Interdisciplinary Studies supports graduate students whose academic interests and career goals are not currently serviced by existing degree programs or span two or more subject areas. This type of interdisciplinary study has been pioneered by the Graduate School & International Education. Currently, the Graduate School & International Education houses five interdisciplinary doctoral programs and six interdisciplinary masters programs that utilize faculty and coursework across every college on the University of Arkansas-Fayetteville campus.  Like the other interdisciplinary graduate programs, the Master of Arts degree in Interdisciplinary Studies will require research and coursework in at least two disciplines and challenges students to thematically link their graduate program of study through an interdisciplinary thesis or capstone research project. This coursework will be offered by faculty from every college at the University.  The target population for this program, similar to the undergraduate program in Interdisciplinary Studies, are both high-achieving students who cannot be adequately served in other degree programs offered by the University as well as those seeking to return to the University to complete their graduate degrees after an absence. This degree-completer audience, consisting of non-traditional working professionals, will be uniquely served through this program as it can combine prior graduate coursework completed in person on the UAF campus or at other accredited institutions (subject to transfer requirements) with online offerings in a variety of areas.  Nationally, these programs reach large populations of online students with the top five largest programs graduating between 80 and 150 students per year. The possibility of combining existing on-campus curriculum with existing online curriculum to create a flexible degree option will place the University in a unique position to support a variety of working professionals, degree-completers, and high achieving graduate students whose needs are not filled by current offerings.  By utilizing existing coursework and graduate programs, no new faculty will be required for this program. Only two courses, an introductory/research methods course and a research capstone course, both offered online, will be required. These courses will be housed within the Graduate School & International Education and will be taught by a variety of faculty hired from across campus. Costs related to course development will be supported by the University’s Global Campus and instructional costs for these required online courses will be supported by tuition revenue based on enrollments. A stipend for the director of the program to complete administrative tasks and advise students will be paid by the Graduate School & International Education. No new library resources or facilities will be required. |

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| 6. North American Industry Classification System (NAICS) – List some industries and/or companies which graduates would be most likely and/or qualified to work in (optional), and feel free to comment on why/in what capacity. Also, a description of the target industry in your region, its relative strength or weakness relative to other regions, and the reasons for that relative strength or weakness, is welcome.  Benchmarking reports from UA-Global Campus indicate that nationally the top companies posting positions for jobs with interdisciplinary studies graduate degrees are: Anthem Blue Cross, Amazon, Whole Foods, Humana, Robert Half, Deloitte, Citigroup, Raytheon Technologies, ExecuNet, and VF Corporation.  Top posted job titles nationally include: program manager, product manager, project manager, controllers, business analysts, human resource business partners, finance managers, and marketing product managers. |
| 7. Region of Possible Position(s) – Describe the region where you think graduates are most likely to work, e.g., in terms of a list of counties, a metropolitan statistical area, or a commuting radius:  Benchmarking reports from UA-Global Campus indicate that in the state of Arkansas, the following employers have sought graduates in this field. They are, in order: University of Arkansas, Walmart, Humana, Anthem Blue Cross, Tyson Foods, Arkansas State University, Black and Veatch, Arkansas Tech University, Robert Half, and University of Central Arkansas.  Top posted job titles in Arkansas include: product managers, controllers, administrative specialists, program managers, human resource business partners, and e-commerce architects. |
| 8. Existing Data – Describe any existing anecdotes or data you have that would shed light on the job prospects of graduates from the proposed academic program. This data can be helpful to ADFA in conducting labor market analysis.  Analysis from UA-Global Campus indicates job prospects in multiple teaching related fields as well as in various management and analyst based positions. |
| 9. Proposed Implementation Date – (MM/DD/YY): 08/15/2023 |
| 10. Contact Person – Provide contact information for the person who can answer specific questions about the program:  Name: Dr. Christa Hestekin  Title: Interim Associate Dean, Graduate School and International Education and Associate Professor of Chemical Engineering  E-  mail: [chesteki@uark.edu](mailto:chesteki@uark.edu) |

Email the completed form: Dr. Nicolas Aguelakakis ([doc.workforce.analysis@arkansas.gov](mailto:doc.workforce.analysis@arkansas.gov)). After the labor market analysis has been completed, the institution will be invited to respond, providing further information that might shed light and help to interpret the data provided.

##### CIP-SOC MATCHING AND THE NCES CROSSWALK (Question 4a & 4b)

Labor market analysis for academic program requires the combination of diverse data sources. The National Center for Education Statistics (NCES) and the Bureau of Labor Statistics (BLS) devel- oped a “CIP-SOC crosswalk” linking fields of study, classified by a well-established classification scheme called Classification of Instructional Programs (CIP), with occupations, classified by a well- established classification scheme called Standard Occupational Classifications (SOC). The CIP- SOC crosswalk is available online, and guidelines on how to use the scheme are posted online.

In question 4a of the form, institutions are asked to copy and paste a list of occupations that match with their instructional programs, taken directly from the NCES CIP-SOC crosswalk, which can be downloaded from the Academic Affairs website.

To use this file to answer question 4a:

1. Select Column A.
2. In the Home ribbon, Editing section of the toolbar, click Find & Select to get a drop- down menu, and select the Find command. As you do this, your screen should look something like this.

Graphical user interface, application, table, Excel

Description automatically generated

1. In the Find and Replace dialog box, enter the CIP code that you’re interested in, and click “Find Next.” Your screen should then look like this:

Graphical user interface, application, table, Excel

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1. Since the CIP-SOC crosswalk file is already sorted by row, you can find all the rows corresponding to your CIP simply by starting from the first cell selected and then reading down in column A until you encounter a different CIP code.
2. Select all of these rows, columns A through D, this will form a table that can be pasted directly into the response field for question 4a.

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| 52.0808 | Public Finance. | 11-3031 | Financial Managers |
| 52.0808 | Public Finance. | 13-2031 | Budget Analysts |
| 52.0808 | Public Finance. | 13-2051 | Financial Analysts |
| 52.0808 | Public Finance. | 25-1011 | Business Teachers, Postsecondary |

1. If desired, ask a faculty or staff member to sort the matched occupations from the CIP-SOC crosswalk by relevancy/importance, with the occupations that seem most likely to employ your graduates ranked first.
2. Missing occupations from the list should be addressed in question 4b.

Question 4b, is requesting information from your local staff/workforce experts at your institution on the applicability of the NCES list. We are aware that the NCES might be “globally” wrong—the CIP/SOC match may never have been very accurate, or may become obsolete as fields and occupations evolve—or “locally” wrong—the CIP/SOC match may be reasonably robust in general, but fail to capture the role your particular program plays in students’ career paths. Graduates of a particular program may be over or underqualified for some of the matched occupations. Also, there may be SOCs not matched to your CIP by NCES for which, however, your program does help to prepare students, and which are likely to provide gainful employment for your graduates. Question 4b is the place to tell us about those as well.

**Appendix B**

**Course Evaluation**

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| ***GRSD Course Evaluation Survey*** | ***University of Arkansas   UARK*** |

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**Appendix C**

**Faculty CV**

**CHRISTA N. HESTEKIN**

*Curriculum Vitae*

University of Arkansas

Associate Professor

Ansel and Virginia Condray Professorship in Chemical Engineering

Associate Head for the Graduate Program

Ralph E. Martin Department of Chemical Engineering

3202 Bell Engineering Center

Fayetteville, AR 72701

Phone: 479-575-3416

FAX: 479-575-7926

Email: [chesteki@uark.edu](mailto:chesteki@uark.edu)

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**Education: Ph.D. in Chemical Engineering**, Northwestern University, June 2006.

Research Advisor: Dr. Annelise Barron, Chemical and Biological Engineering.

**B.S. Chemical Engineering**, University of Kentucky, May 2000.

**Professional University of Arkansas**, Fayetteville, AR, 08/06-present

**Experience:** *Associate Professor 2013 - present*

*Interim Department Head 2021*

*Assistant Professor 2006 – 2013*

Research interests include electrically driven separations with emphasis on biomedical (Alzheimer’s disease, artificial kidney) and biological applications (algae genotyping). **Over $4.25 million in funding as PI and co-PI.**

**Northwestern University,** Evanston, IL, 8/00-6/06

*Graduate Research Assistant.* Performed research towards Ph.D. dissertation including the development of a highly sensitive and specific microchip electrophoresis mutation detection method for genotyping tumor tissue from cancer patients. **Research led to continuation of NIH funding and multiple publications.**

**Major Awards and Recognition**

**Ralph E. Martin Department of Chemical Engineering Teaching Award (2020).** One award is given each year to recognize outstanding teaching within the department.

**University of Arkansas Teaching Academy Inductee (2017).** The Teaching Academy is composed of faculty members who have been recognized by their peers, colleges, and the university for their excellence in teaching.

**College of Engineering Rising Teaching Award (2017).** This award is given by the College of Engineering in recognition of outstanding teaching by a faculty member each year.

**Honors College Distinguished Faculty Award (2012).** This award is given by the Honors College in recognition of their support to students. Three awards are given each year.

**University of Arkansas Outstanding Faculty Nominee (2012).** This nomination is made by a student to the student government in recognition of a faculty member who has been an important influence in their life. One of nine nominees in 2012.

**University of Arkansas Golden Tusk Award (2012).** This award is given by the Division of Student Affairs based on nomination as a faculty member going “above and beyond.”

**Ralph E. Martin Department of Chemical Engineering Teaching Award (2011).** One award is given each year to recognize outstanding teaching within the department.

**Molecular Biology of Breast Neoplasia Training Fellowship (2003-2004).** Recipient of competitive graduate fellowship for students whose research involved breast cancer.

**Students Mentored (Former students have current assignments listed in bold.)**

***Graduate***

**Davinder Braich** M.S. CHEG (Fall 2020) **Tyson Foods**

**Grekeem Cartwright** M.S. CHEG (Spring 2021) **Alliantgroup**

**Haley Duncan** M.S. (Spring 2021) / Ph.D. CHEG

**Juliana Louzada Marcal**, MS CHEG (co-advised with J. Hestekin)

**Eric Walker,** Ph.D. CHEG (co-advised with J. Hestekin)

**Leticia Santos de Souza**, Ph.D. CHEG (co-advised with J. Hestekin)

**Efecan Panakker** Ph.D. CHEG (co-advised with J. Hestekin, Summer 2021) **post-doc at KU Leuven (Belgium)**

**Humeyra Ulusoy-Erol** Ph.D. CHEG (co-advised with J. Hestekin, Spring 2021) **CatalyzeH2O**

**Xavier Redmon** Ph.D. CHEG (Summer 2021) **Evonik**

**Jennifer Kurtz** M.S. BMEG (Summer 2015) **Wells Fargo**

**Sadia Paracha** M.S. CHEG (Fall 2015) **Merck**

**Emilio Duverna** M.S. CEMB (Summer 2015) **Vertex Pharmaceutical**

**Elizabeth Pryor** Ph. D. CHEG, (Fall 2012); 2012 Ralph E. Martin Department of Chemical Engineering Outstanding Graduate Student Research Award, Women in Engineering student coordinator. **Novazymes**

**Alice Jernigan** Ph. D. CHEG (Spring 2013, M.S. CHEG Summer 2009); 2009 2nd place American Electrophoresis Society Poster Award, 2008 3rd place American Electrophoresis Society Poster Award **Company Owner of Hyperdyne Systems Inc**

**Michael May** M.S. BMEG (Spring 2014) **MANA Medical Associates**

**Sowmya Krothapalli** M.S. CHEG (Fall 2008); **Fresenius Medical Care North America**

***Undergraduate (selected from 40+ total)***

**Catherine Atchley** (2017 – 2018), EcoREU and undergraduate researcher, **Engineer/Designer II at Atwell, LLC**

**Sadie Beeman** (2020 - 2021)

**Siddhi Bhat** (2021 – present)

**Brandon Booth** (2009), George Washington Carver Research Summer Research Experience 1st Place Poster Competition

**Gram Booth** (2016 – 2018), Honors College Thesis, **Technical Consultant at capSpire**

**Jeremiah Born** (2008 - 2009), Honors College Research Grant recipient. **Process Engineer at Westlake Chemical.**

**Andrew Bryson** (2015 – 2016), Honors College Thesis, **attended UAMS and now practices medicine in Jonesboro, AR**

**Caroline Campbell** (2019 – 2021), Honors thesis, **Process Engineer at Baxter**

**Lauren Cole** (2013 – 2014), Honors thesis, **Area Manager at Eastman**

**Kimberly Cribbs** (2016 – 2017) Honors thesis, **Engineer I - NCDEQ Public Water Supply**

**Elizabeth Crowder** (2011). **Accepted to Pharmacy School for Spring 2013.**

**Benjamin Drewry** (2015 – 2018), **PhD student at University of Texas**

**Keiron Durant** (2013 – 2014), Honors thesis, **Process Engineer at LANXESS**

**Amanda Elswick** (2020 – 2021), **PA major at University of Oklahoma**

**Zach Fricke** (2007) **Process Engineer at Dow Chemical.**

**Micah Fritsche** (2008 - 2009), Honors College Research Grant recipient, Honors College Thesis, **obtained M.D. from University of Arkansas Medical School, currently radiology resident at Vanderbilt University.**

**Jennifer Gaines** (2017 – 2018), **Process Engineer at FutureFuel Chemical Company**

**Josh Goodrich** (2021 - present)

**Jesse Haney III** (2007 - 2008), Honors College Grant recipient, **Process Engineer at Tate and Lyle.**

**Meghan Hemken** (2011), Sustainability, **REU obtained MS from University of Michigan and currently Research Scientist at Minnesota Pollution Control Agency.**

**Luis Jiminez** (2007- 2008), Honors College Research Grant recipient.

**Jennifer Kurtz** (2011- 2012), Honors College Research Grant recipient, Honors College Thesis. **obtained MS from University of Arkansas and now Financial Consultant at** **Wells Fargo.**

**Svenja Lenhardt** (2010), RISE in North America Recipient

**Jessica Orton** (2020), **PhD graduate student at Cornell University**

**Thomas Lewis** (2007 - 2008), Honors College Research Grant recipient, Honors College Thesis. **obtained Ph.D. from University of Texas at Austin**, **now** **Senior Manager, Cell Therapy Business Insights & Analytics - Global Product Supply at Bristol** **Myers Squibb.**

**Hannah Lintag** (2008 - 2011), Honors College Research Grant recipient, SURF recipient, Honors College Thesis). **Process Engineer at Albermarle.**

**Jessica Orton** (2018 – 2020), Honors College Thesis.

**William Scott** (2007 - 2008). **obtained** **Ph.D. from University of California David and now post-doc at Wageningen University & Research (Netherlands).**

**Florencio Serrano Castillo** (2013 – 2014), Honors thesis, **Senior Scientist at Amgen**

**Kirsten Stuesser** (2011, Sustainability REU). **Graduating with B.S. in Biological Sciences at the University of Arkansas in Fall 2012 and accepted to UAMS for degree in Nuclear Medicine Imaging.**

**Caitlin Stellpflug** (2011). **Pharmacy Technician**

**Katelyn Thomas** (2010 - 2011, MicroEP REU, Honors College Research Grant recipient, Honors College Thesis), **obtained DDM at Midwestern University and currently dentist at ABQ Modern Dental Group.**

**Kayla Tichy** (2013 – 2014), Honors thesis, **Senior Production Engineer at ConocoPhillips**

**Nicole Turnage** (2012, INBRE summer program).

**Anh Vu** (2012). Honors College Thesis, **Battery Engineer at COnovate Inc.**

**Shane Weindel** (2011 - 2012), Honors College Research Grant recipient, Honors College Thesis. **Attended University of Arkansas Medical School, currently Pathologist in Kansas City, KS**

**Benjamin Yeldell** (2017 – 2018), **Staff Engineer at Eastman**

**Kenya Zahir** (2012), George Washington Carver Research Summer Research Experience

**Papers and Presentations**

***Refereed Journal Publications***

1. ML Menegazzo, HB Ulusoy-Erol, **CN Hestekin**, JA Hestekin, GG Fonseca, “Evaluation of the yield, productivity, and composition of fatty acids methyl esters (FAME) obtained from the lipidic fractions extracted from Chlorella sorokiniana by using ultrasound and agitation combined with solvents,” *Biofuels,* 13, 519-526 (2022)

2. ML Menegazzo, VM Nascimento, **CN Hestekin**, JA Hestekin, GG Fonseca, “Evaluation of Chlorella sorokiniana cultivated in outdoor photobioreactors for biodiesel production,” *Biofuels* 13, 483-488 (2022)

3. E. Pakkaner, C. Smith\*, C. Trexler\*, J. Hestekin, and **C. Hestekin**, “Blood driven biopower cells: acquiring energy from reverse electrodialysis using sodium concentrations from the flow of human blood,” *Journal of Power Sources*, 488, 229440 (2021).

4. H.B. Ulusoy-Erol, **C.N. Hestekin**, and J.A. Hestekin, “Effects of resin chemistries on the selective removal of industrially relevant metal ions using wafer-enhanced electrodeionization,” *Membranes*, 11(1) (2021).

5. **C.N. Hestekin**, J.A. Hestekin, S. Paracha, G. Morrison, E. Pakkaner, J. Moore, L. Souza, S. Stephens, C. Atchley\*, and I. Kurtz, “Towards Simulating Nephron Ion Transport Function Using Activated Wafer Electrodeionization,” *Communications Materials*, 1(20) (2020). https://doi.org/10.1038/s43246-020-0016-3

6. H.B. Ulusoy-Erol, M.L. Menegazzo, E. Gottberg, J. Vaden, M. Asgharpour, **C.N. Hestekin**, and J.A. Hestekin, “*Porphyridium cruentum* Grown on Swine Waste Has Minimal Changes to Productivity and Fatty Acid Composition,” *Energies*, 13(12) (2020). https://doi.org/10.3390/en13123194

7. M.L. Menegazzo, V.M. Nascimento, **C.N. Hestekin**, J.A. Hestekin, and G.G. Fonseca, “Evaluation of *Chlorella sorokiniana* cultivated in outdoor photobioreactors for biodiesel production,” *Biofuels*, (2020) https://doi.org/10.1080/17597269.2020.1763094

8. M.L. Menegazzo, H.B. Ulusoy-Erol, **C.N. Hestekin**, J.A. Hestekin, and G.G. Fonseca, “Evaluation of the yield, productivity, and composition of fatty acids methyl esters (FAME) obtained from the lipidic fractions extracted from *Chlorella sorokiniana* by using ultrasound and agitation combined with solvents,” *Biofuels*, (2020). https://doi.org/10.1080/17597269.2020.1779977

9. Paracha, S. and **Hestekin, C.**, “Field amplified sample stacking of amyloid beta (1-42) oligomers using capillary electrophoresis,” *Biomicrofluidics*, 10(3) 033105 (2016) doi: 10.1063/1.4954051.

10. Jernigan, A. and **Hestekin, C.**, “Capillary Electrophoresis-Single Strand Conformational Polymorphisms (CE-SSCP) as a Method to Differentiate Algal Species,” *Journal of Analytical Methods in Chemistry*, http://dx.doi.org/10.1155/2015/272964, (2015).

11. Pryor, N.E., M.A. Moss, and **C.N. Hestekin**, “Capillary Electrophoresis for the Analysis of the Effect of Sample Preparation on Early Stages of Aβ1-40 Aggregation,” *Electrophoresis*,35 (12-13) 1814-1820 (2014).

12. Jernigan, A., M. May, T. Potts, B. Rodgers, J. Hestekin, P.I. May, J. McLaughlin, R.R. Beitle, and **C. Hestekin**, “Effects of drying and storage on year-round production of butanol and biodiesel from algal carbohydrates and lipids using algae from water remediation,” *Environ Prog Sustain Energy*, 32 (4) 1013-1022 (2013).

13. Krothapalli, S., May, M., and **C.N. Hestekin**, “Capillary Electrophoresis – Single Strand Conformation Polymorphism for the Detection of Multiple Mutations Leading to Tuberculosis Drug Resistance,” *J. Microbiol. Methods*, in press (2012)

14. Pryor, N.E., M.A. Moss, and **C.N. Hestekin**, “Unraveling the Early Events of Aβ Aggregation: Techniques for the Determination of Aβ Aggregate Size,” *Int. J. Mol. Sci.*, 13(3) 3038-3072 (2012).

15. Pryor, E., J.A. Kotarek, M.A. Moss, and **C.N. Hestekin**, “Monitoring Insulin Aggregation via Capillary Electrophoresis,” *Int. J. Mol. Sci.*, 12(12) 9369-9388 (2011).

16. **Hestekin, C.N**., J.S. Lin, L. Senderowicz, J.P. Jakupciak, C. O’Connell, A. Rademaker, and A.E. Barron, “Blinded study determination of high sensitivity and specificity microchip electrophoresis–SSCP/HA to detect mutations in the p53 gene,” *Electrophoresis*, 32(21) 2921-2929 (2011).

17. Hill, B.W., C.S. Gattis, **C.N. Hestekin**, N. Tschepikow, G.S. Denny and E.C. Clausen,”UAESP: A New and Improved Program for Helping Middle School Teachers Devise Their Own Hands-on Engineering and Science Activities,” Proceedings of the 2010 American Society for Engineering Education Midwest Section Annual Conference, 2010.

18. Davis, S.G., B.W. Hill, C.S. Gattis, B. M. Dearing, **C.N Hestekin** and E.C. Clausen, “UASPP: Three Years of Helping Middle School Teachers Devise Their Own Hands-on Engineering and Science Activities,” Proceedings of the 2009 American Society for Engineering Education Midwest Section Annual Conference, 2009.

19. R.J. Meagher, J.A. Coyne, **C.N. Hestekin**, T.N. Chiesl, R.D. Haynes, J.-I. Won and A.E. Barron, “Highly multiplexed p53 mutation detection by free-solution conjugate microchannel electrophoresis with polyamide drag-tags,” *Anal. Chem.,* 79(5) 1848-1854 (2007)

20. **C.N. Hestekin**, J.P. Jakupciak, T.N. Chiesl, C.W. Kan, C.D. O’Connell, and A.E. Barron, “An optimized microchip electrophoresis system for mutation detection by tandem SSCP and heteroduplex analysis for p53 gene exons 5-9,” *Electrophoresis,* 27 3823-3835 (2006)*.*

21. **C.N. Hestekin** and A.E. Barron, “The Potential of Electrophoretic Mobility Shift Assays for Clinical Mutation Detection,” *Electrophoresis,* 27 3805-3815 (2006).

22. I.V. Kourkine, **C.N. Hestekin**, B.A. Buchholz, and A.E. Barron, “High-throughput, high sensitivity genetic mutation detection by tandem single strand conformation polymorphism (SSCP) – heteroduplex analysis (HA) capillary array electrophoresis (CAE),” *Anal.Chem.*, 74 2565-2572 (2002).

23. I.V. Kourkine, **C.N. Hestekin**, and A.E. Barron, “Technical Challenges in Applying Capillary Electrophoresis (CE)-Single Strand Conformation Polymorphism (SSCP) for Routine Genetic Analysis,” *Electrophoresis*, 23 1375-1385 (2002).

24. J. A. Hestekin**, C. N. Smothers (Hestekin)**, and D. Bhattacharyya, "Nanofiltration of Charged Organic Solutes from Aqueous and Non-Aqueous Streams: Mechanisms and Experimental Results", in Membrane Technology in the Chemical Industry, Edited by S. P. Nunes and K. V. Peinemann, Wiley-VCH, 173-190 (2001).

25. M. E. Williams, J. A. Hestekin, **C. N. Smothers (Hestekin)**, and D. Bhattacharyya, "Separation of Organic Pollutants by Reverse Osmosis and Nanofiltration Membranes: Mathematical Models and Experimental Verification", *Ind. Eng. Chem. Res.,*38, 3683-3695 (1999).

\* = undergraduate student

***Patents and Patent Applications***

1. J.A. Hestekin, C.N. Hestekin, G.A. Morrison, and S.A. Paracha, “Dialysate free artificial kidney device,” US Patent#10933184B2

2. R. Beitle, C.N. Hestekin, A. Elmasheiti, K. Cribbs, M. Rienisch, B.C. Jones, A. Swearingen, B. Hart, K. Clark, and V. Thompson, “Simple LAMP PCR Design For Low Resource Setting And Minimal Environmental Footprint,” US Patent #11,052,330

3. J. Hestekin, C. Hestekin, C. Smith, B. Rodgers, and P.R.Lima Vieira, “Medical implants powered by reverse electrodialysis,” US Patent#20190374780A1

***Invited Presentations***

1. C. Hestekin (speaker), “A Dialysate Free Portable Artificial Kidney Device”, Presented at University of Tulsa (Spring 2022)

2. C. Hestekin (speaker), “A Dialysate Free Portable Artificial Kidney Device”, Presented at University of San Francisco Inventors Forum (Spring 2022)

3. Hestekin, J. (speaker), Hestekin, C., Ludlow, L., Kurtz, I., NAMS 2021, "Towards an Artificial Kidney," North American Membrane Society, Estes Park, CO, United States. (Fall 2021).

4. Hestekin, J. (speaker), Hestekin, C., Ludlow, R., Kurtz, I., ASAIO 2021, "Towards an Artificial Kidney," International Federation of Artificial Organs, Washington, DC, United States. (Summer 2021).

5. C. N. Hestekin (speaker), “Electrically Driven Separations for Environmental and Medical Applications”, Presented at LSU (Spring 2017).

6. C. N. Hestekin (speaker), “Amyloid Oligomer Analysis Using Microchannel Electrophoresis”, Presented at PITTCON (Spring 2016).

7. C. N. Hestekin (speaker), “Capillary and Microchip Electrophoresis for Detection of Protein Aggregation”, Presented at the University of South Carolina (*Fall 2012*).

8. C. N. Hestekin (speaker), “Microchannel Electrophoresis for Detection of Biomedical and Environmental Applications”, Presented at the University of Kentucky (*Fall 2012*).

9. C. N. Hestekin (speaker), “Microchannel Electrophoresis for Detection of Protein Aggregation”, Presented at the University of Miami (2012).

10. C. N. Hestekin (speaker), “Microchannel Electrophoresis for Biological Applications,” Presented at Mississippi State University (2008).

***Other Presentations***

1. Santos de Souza, L. (speaker), Hestekin, J., Hestekin, C., Kurtz, I., NAMS 2022, "Towards an Artificial Kidney," North American Membrane Society, Estes Park, CO, United States, May 2022
2. Hestekin, J. (speaker), Hestekin, C., NAMS 2022, “Powering up Biomedical Devices by Harnessing Energy from Reverse Electrodialysis” North American Membrane Society Annual Meeting, May 2022
3. Hestekin, J. (speaker), Hestekin, C., Ludlow, R., Kurtz, I., NAMS 2021, "Towards an Artificial Kidney," North American Membrane Society Annual Meeting, Estes Park, CO, United States, August 2021
4. Carter, S., Hestekin, J., Pakkaner, E., Hestekin, C., Kurtz, I., ASAIO, "Novel Nanocellulose Membrane for Dialysis," International Federation for Artificial Organs, Washington, DC, United States, June 2021
5. Efecan Pakkaner, Jessica Orton, Jamie. Hestekin and Christa Hestekin, “Powering up Biomedical Devices by Harnessing Energy from Reverse Electrodialysis using Sodium Concentrations from the Flow of Human Blood” North American Membrane Society Annual Meeting, May 2020
6. Jamie Hestekin, Leticia Santos De Souza, John Moore, and Christa Hestekin, “Ion Transport Improvement by Surface Modification of Beads” North American Membrane Society Annual Meeting, May 2020
7. Humeyra Ulusoy Erol, Jamie Hestekin and Christa Hestekin, “Effects of resin bead chemistries on the selective removal of industrially relevant metal ions using wafer-enhanced electrodeionization” North American Membrane Society Annual Meeting, May 2020.
8. Humeyra B. Ulusoy Erol, Christa N. Hestekin and Jamie A. Hestekin, “Selective Separation of Industrially Relevant Metal Ions from High TDS Water Using Wafer-Enhanced Electrodeionization (WE-EDI)” North American Membrane Society, May 2019.
9. Xavier Redmon, Zeb Vance, Melissa Moss, and Christa Hestekin, “Separating Early Stage Amyloid Aggregates Using Microchannel Electrophoresis,” AIChE Annual Meeting, November 2019.
10. Haley Duncan and Christa Hestekin, “Utilizing Gel Electrophoresis to Separate Aggregates after Photo-Crosslinked Proteins,” AIChE Annual Meeting, November 2019. (poster)
11. Humeyra B. Ulusoy Erol, Christa N. Hestekin and Jamie A. Hestekin, “Selective Separation of Industrially Relevant Metal Ions from High TDS Water Using Wafer-Enhanced Electrodeionization (WE-EDI)” AIChE Annual Meeting, November 2019.
12. Humeyra B. Ulusoy Erol, Cody Bossio, Christa N. Hestekin and Jamie A. Hestekin, “Selective Separation of Industrial Metal Ions from High Tds Water Using Wafer-Enhanced Electrodeionization (WE-EDI)” NAMS, 2018.
13. Efecan Pakkaner, Chase Smith, Nickolas M. Newnham, Jessica Orton, Jamie A. Hestekin and Christa N. Hestekin, “Miniaturized Reverse Electrodialysis Biobattery for Biomedical Applications”, NAMS 2018.
14. Xavier Redmon, Zeb Vance, Melissa Moss, and Christa Hestekin, “Improving the Understanding of Early Stage Amyloid Aggregation Using Microchannel Electrophoresis,” AES Annual Meeting at SCIX, October 2018
15. Haley Duncan and Christa Hestekin, “Utilizing Fluorescent Capillary Electrophoresis & Dyes to Study the Hydrophobicity of Amyloid Beta,” AES Annual Meeting at SCIX, October 2018
16. Hestekin, C., C. Smith, B. Rodgers, and J. Hestekin. “Novel Reverse Electrodialysis Biofuel Cell.” Presented at the AIChE Annual Meeting, Minneapolis, MN October 29 – November 3, 2017.
17. Redmon, X., M. Moss, and C. Hestekin. “Improving the Understanding of Early Stage Amyloid Aggregation Using Microchannel Electrophoresis.” Presented at the AIChE Annual Meeting, Minneapolis, MN October 29 – November 3, 2017.
18. Ulusoy-Erol, H., M. L. Menegazzo, E. Gottberg, J. Vaden, M., C. N. Hestekin and J. A. Hestekin. “Porphyridium cruentum Grown on Swine Waste has Minimal Changes to its Fatty Acid Composition.” Presented at the AIChE Annual Meeting, Minneapolis, MN October 29 – November 3, 2017.
19. Ulusoy-Erol, H., C. Atchley, B. Drewry, Y. J. Lin, C. N. Hestekin and J. A. Hestekin. “Understanding the Effects of Carbon Dioxide and Bicarbonate on Chlamydomonas reinhardtii.” Presented at the AIChE Annual Meeting, Minneapolis, MN October 29 – November 3, 2017.
20. Vance, S. Z., R. Hall, J. Crawford, G.L. Booth, C.N. Hestekin, and M.A. Moss. “Understanding the Role of Glycine in Amyloid Protein Aggregation through Rationally Designed Protein Sequences.” Presented at the AIChE Annual Meeting, Minneapolis, MN October 29 – November 3, 2017.
21. Hestekin, C., C. Smith, B. Rodgers, and J. Hestekin. “Novel Reverse Electrodialysis Biofuel Cell.” Presented at the ICOM Meeting, San Francisco, CA July 29 – August 4, 2017.
22. Hestekin, C., C. Smith, P. Vieira, B. Rodgers, and J. Hestekin. “Novel Reverse Electrodialysis Biobattery.” Presented at the ECI: Advanced Membrane Technology VII Conference, Cork, Ireland September 11-16, 2016.
23. Redmon, X., M. Moss, and C. Hestekin. “Improving the Understanding of Early Stge Amyloid Aggregation Using Microchannel Electrophoresis.” Presented at AES Electrophoresis Society / AIChE Annual Meeting, San Francisco, CA November 13-18, 2016.
24. Hestekin, C.N., S. Paracha, J. Kurtz, and M.A. Moss. “Analysis of Amyloid Oligomers Using Microchannel Electrophoresis.” Presented at the Annual Meeting of AIChE / AES Electrophoresis Society Meeting, Salt Lake City, UT, November 8-13, 2015.
25. Hestekin, C.N., S. Paracha, and M.A. Moss. “Analysis of Amyloid Protein Aggregation Using Microchannel Electrophoresis.” Presented at Pacifichem, Honolulu, HI, December 15-20, 2015.
26. Hestekin, C.N., M.A. Moss, E. Pryor, J. Kurtz, and S. Paracha. “Microchannel Electrophoresis for the Analysis of Amyloid Protein Oligomers.” Presented at the Annual Meeting of AIChE / AES Electrophoresis Society Meeting, Atlanta, GA, November 16-21, 2014.
27. Jernigan, A., M. May, T. Potts, B. Rogers, J. Hestekin, P. May, J. McLaughlin, R. Beitle, and C. Hestekin. “Effects of Storage on Extraction of Algal Carbohydrates and Oils for Biofuel Production.” Presented at the American Institute of Chemical Engineers (AIChE) Annual Meeting, San Francisco, CA, November 3-8, 2012.
28. Pryor, E., M. Moss, and C. Hestekin. “Microchannel Electrophoresis Analysis of Amyloid Protein Aggregation.” Presented at the AIChE / AES Electrophoresis Society Annual Meeting, San Francisco, CA, November 3-8, 2012.
29. E. Pryor, M. Moss, and **C. Hestekin** (presenter), “The Use of Microchannel Electrophoresis to Understand Amyloid Aggregation,” AIChE/AES Meeting, October 2011 (Minneapolis, MN).
30. A. Jernigan and **C. Hestekin** (presenter), “Algae Genotyping for Biofuel Production,” AIChE/AES Meeting, November 2010 (Minneapolis, MN).
31. A. Jernigan (presenter), H. Lintag, and **C. Hestekin**, “Detection of Rare Variants of Type 2 Diabetes by CE-SSCP. American Institute of Chemical Engineers Meeting, November 2010 (Salt Lake City, UT).
32. E. Pryor (presenter), M. Moss, and **C. Hestekin**, “Electrophoretic Separation of Amyloid Proteins Via Capillary Electrophoresis,” American Institute of Chemical Engineers Meeting, November 2010 (Salt Lake City, UT).
33. A. Jernigan and **C. Hestekin** (presenter), “Algae Genotyping for Biofuel Production. AIChE/AES Meeting,” November 2010 (Minneapolis, MN).
34. A. Jernigan (presenter), J. Hestekin, and **C. Hestekin**, “Monitoring Algae Species in Bio-fuel Production by CE-SSCP,” Presented at American Electrophoresis Society Poster Session of AIChE Meeting, November 2009 (Nashville, TN).
35. E. Pryor (presenter), M. Moss, and **C. Hestekin**, “Capillary Electrophoresis as a Tool to Monitor the Early Stages of Insulin Aggregation,” Presented at American Electrophoresis Society Poster Session of AIChE Meeting, November 2009 (Nashville, TN).
36. A. Jernigan (presenter), G. Thoma, D. Wolf, and **C. Hestekin**, “Monitoring Bioremediation Using Single Strand Conformational Polymorphism and Capillary Electrophoresis,” Presented at American Electrophoresis Society Poster Session of AIChE Meeting, November 2009 (Nashville, TN).
37. E. Pryor (presenter), M. Moss, and **C. Hestekin**, “The Use of Capillary Electrophoresis to Monitor the Early Stages of Insulin Aggregation,” AIChE Meeting, November 2009 (Nashville, TN).
38. **C. Hestekin** (presenter) and S. Krothapalli, “Rapid and Sensitive Detection of Drug Resistant Tuberculosis Mutations,” AES Annual Meeting at AIChE Meeting, November 2009 (Nashville, TN).
39. A. Jernigan (presenter), G. Thoma, D. Wolf, **C. Hestekin**, “Characterizing the Abundance and Activity of Soil Microbes using Single-Strand Conformational Polymorphism by Capillary Electrophoresis,” Presented at American Electrophoresis Society Poster Session of AIChE Meeting, November 2008 (Philadelphia, PA).

**Funded Projects since Appointment ($4,247,830 total)**

***PI ($1,426,948 total)***

Project Title (PI): USKRC Year 7

Source of Support: US Kidney Research Corp

Total Award Amount: $686,805

Total Award Period Covered: 11/01/2021 - 10/31/2022

Project Title (PI): Reverse Electrodialysis Based Medical Devices for Pacemaker Battery Charging

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $18,338

Award Period Covered: 07/01/2018 - 06/30/2019

Project Title (PI): Study of Amyloid Protein Oligomerization Using Microchannel Electrophoresis

Source of Support: National Science Foundation

Total Award Amount: $425,706

Award Period Covered: 07/01/2015 - 06/30/2018

Project Title (PI): Understanding Amylin Aggregation for Improved Diabetes Treatment

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $18,374

Award Period Covered: 07/01/2012 - 05/31/2013

Project Title (PI): The Production of Fuel Grade Butanol and Characterization of Algae Production from the Rockaway Wastewater Treatment Plant.

Source of Support: New York City

Total Award Amount: $99,119

Total Award Period Covered: 12/01/2011 - 08/31/2012

Project Title (PI): Microchannel Electrophoresis Analysis of Amyloid Aggregation State for Alzheimer’s Disease Drug Design

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $25,900

Award Period Covered: 07/01/2011 - 05/31/2012

Project Title (PI): Microchannel Electrophoresis Analysis of Amyloid Aggregation State for Alzheimer’s Disease Drug Design

Source of Support: NIH COBRE Phase III

Total Award Amount: $8,000

Award Period Covered: 07/01/2011 - 05/31/2012

Project Title (PI): Microchannel Electrophoresis Monitoring of Early Stages of Amyloid Protein Aggregation.

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $31,536

Total Award Period Covered: 07/01/2010 - 05/31/2011

Project Title (PI): Microchannel Electrophoresis Monitoring of Early Stages of Amyloid Protein Aggregation.

Source of Support: NIH COBRE Phase III

Total Award Amount: $4,000

Total Award Period Covered: 07/01/2010 - 05/31/2011

Proposal Title (PI): Proteomic-based understanding of prostate cancer in light of central

carbon flow.

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $75,000

Total Award Period Covered: 07/01/2008 - 05/31/2009

Project Title (PI): PCR-Free Detection of Methylated DNA by Microchannel Electrophoresis

Source of Support: Arkansas Biosciences Institute

Total Award Amount: $30,720

Total Award Period Covered: 07/01/2007 - 05/31/2008

***Co-PI ($2,820,882 total)***

Project/Proposal Title (co-PI): USKRC Year 6

Source of Support: Curion Research Corporation

Total Award Amount: $310,000

Total Award Period Covered: 03/15/2021 – 03/14/22

Project/Proposal Title (co-PI): USKRC Year 5

Source of Support: Curion Research Corporation

Total Award Amount: $300,000

Total Award Period Covered: 03/01/2020 – 02/28/21

Project/Proposal Title (co-PI): COVID-19 Rapid: Sprayable Cellulosic Nanoparticle Coatings for Covid 19

Source of Support: National Science Foundation

Total Award Amount: $194,865

Total Award Period Covered: 06/01/2020 – 05/31/21

Project/Proposal Title (co-PI): Curion Year 4

Source of Support: Curion Business Software

Total Award Amount: $358,746

Total Award Period Covered: 09/01/2018 – 12/31/19

Project/Proposal Title (co-PI): Biological Research

Source of Support: Curion Business Software

Total Award Amount: $916,257

Total Award Period Covered: 09/01/2015 – 08/31/18

Project/Proposal Title (co-PI): Integrated Research Approach for Sustainable Algal Energy Production and Environmental Remediation: The Chesapeake Algae Project (CHAP).

Source of Support: Statoil Hydro

Total Award Amount: $250,000

Total Award Period Covered: 10/01/2009 – 04/30/12

Project/Proposal Title (co-PI): University of Arkansas-Engineering Science Partnership Proposal.

Source of Support: Arkansas Department of Education

Total Award Amount: $501,014

Total Award Period Covered: 07/01/2009 - 06/30/2012

***External Funding for Student Projects ($8,225)***

Project Title: Identification of Algae Species via CE-SSCP for Biofuel Production

Source of Support: Arkansas Department of Higher Education

Amount: $2,125

Total Award Period Covered: 2011

Student: Hannah Lintag

Project Title: Rapid Detection of Mutations Leading to Type 2 Diabetes via CE-SSCP

Source of Support: Arkansas Department of Higher Education

Amount: $2,650

Total Award Period Covered: 2010

Student: Hannah Lintag

Project Title (PI): Understanding Amyloid Protein Aggregation.

Source of Support: DAAD RISE

Total Award Amount: $3,450

Total Award Period Covered: 08/01/2010 – 10/31/2010

Student: Svenja Lenhardt

**Service**

***Conference Chairs***

**AES Session Co-Organizer:** 2012 SCIX Annual Meeting

**Overall Conference Co-Chair:** 2009 American Electrophoresis Society Annual Meeting

**Overall Conference Chair:** 2000 American Institute of Chemical Engineers Southern Regional Meeting

**Average of at least one chair and co-chair responsibility over the last 15 years at American Institute of Chemical Engineers and American Electrophoresis Society.**

***Other Recognition and Service Achievements***

American Electrophoresis Society Past-President (2017-2019)

American Electrophoresis Society President (2015-2017)

American Electrophoresis Society Vice President (2013-2015)

American Electrophoresis Society Board Member (2010-2013; 2017 - 2019)

Alpha Chi Sigma Fraternity Advisor (co-advisor: 2007-2014, advisor: 2014-present)

Judge at Junior Academy of Sciences Fair (2007)

Junior Achievement High School Program Advisor (2005-2006)

Reviewer for the journals including *Electrophoresis* and *Chemical Engineering Education*.

Reviewer for NSF, DOE, and NIH panels.

**Teaching**

***Classes Taught as an Assistant Professor***

Thermodynamics I, Mass II, and Engineering Principles for Molecular Biology. Average Teaching Evaluation 4.1/5.0.

***Classes Taught as an Associate Professor***

Thermodynamics I, Fluid Mechanics, Heat and Mass Transfer, Design II, Introduction to Chemical Engineering II, Separation Processes, Polymers, Advanced Separations, and Transport Processes I. Average Teaching Evaluation 4.7/5.0.