

# Cell and Molecular Biology (CEMB)

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Cell and Molecular Biology Program Website (<http://cemb.uark.edu>)

## Degrees Conferred:

M.S., Ph.D. (CEMB)

**Program Description:** Cell and Molecular Biology is an interdisciplinary graduate program incorporating faculty from 17 departments and four colleges in the University of Arkansas system. Graduate studies may be pursued in any area of cell or molecular biology for which there is faculty expertise.

**Primary Areas of Faculty Research:** The study of various aspects of cell function, structure, metabolism, and chemical functions on, within, and between cells; the study of biomolecular interactions; the relationships between biomolecular reactions and observed cellular properties; molecular genetics, protein chemistry, biological structures; as well as the use of molecular detection methods to detect or characterize biological states in prokaryotes, eukaryotes, systematics, forensics, or health care.

## M.S. in Cell and Molecular Biology

**Admission to Degree Program:** All applicants must have a B.A. or B.S. in a basic or applied science. Applicants must present Graduate Record Examination scores for the Verbal and Quantitative tests, and the GRE writing instrument. For admission, a student must have a sponsoring faculty member. The sponsoring faculty member will submit probable thesis subjects to the Program Committee prior to acceptance of the student. Once an applicant has been approved by the Program Committee, applications are forwarded to the Graduate School for application for admission to the Graduate School. Admitted and sponsored students will be responsible for the Graduate School's application fee unless paid by the department of the sponsoring faculty member. When deemed appropriate by the Director and Program Advisory Committee, the Cell and Molecular Biology program will allow a qualified applicant to be admitted to complete research rotations through up to three designated research laboratories during his/her first semester enrolled in the Cell and Molecular Biology graduate program. Admission for research rotations is contingent up: 1) Stipend support has been guaranteed for the student during the rotation semesters; and 2) the Cell and Molecular Biology faculty designated for the rotation have agreed to host the student during this period. After the rotation period, the student must obtain a faculty research sponsor.

**Requirements for the Master of Science Degree:** For the M.S. degree, the Graduate School and/or the program requires 30 semester hours, a

comprehensive examination, a cumulative GPA of 3.00, and a minimum residence of 30 weeks. Any student who receives a grade of "F" in any graduate-level course will be subject to dismissal following review by the Program Advisory Committee. All candidates for the M.S. must complete a minimum of 24 hours of post-baccalaureate graduate credits not including seminar and thesis credit hours (18 hours plus CHEM 5813 and CHEM 5843) in Cell and Molecular Biology-approved courses and 6 hours of thesis research. In addition, all candidates who are considered full-time must enroll every fall and spring semester in a Cell and Molecular Biology designated seminar course. Graduate advisory and thesis committees will consist of at least three program faculty representing at least two different departments. With the approval of the student's Graduate Advisory Committee, up to 6 hours of alternative graduate courses may be used to satisfy the 24 hours of course work. All M.S. candidates must complete a thesis based on their research and pass a comprehensive oral examination based on the thesis. Examination and approval of the thesis is by the student's Graduate Thesis Committee. Just prior to the Final Examination, the M.S. candidate will present a public seminar announced to all Cell and Molecular Biology faculty and students.

Students should also be aware of Graduate School requirements with regard to master's degrees (<http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext>).

## Ph.D. in Cell and Molecular Biology

**Requirements for the Doctor of Philosophy Degree:** Candidates for the Ph.D. must complete 18 hours of dissertation research. Students wishing to bypass the M.S. for a Ph.D. must complete the same 24 hours of course work in Cell and Molecular Biology-approved course work as for the M.S. degree, plus a minimum of 18 hours of dissertation research. In addition, all candidates who are considered full-time must enroll every fall and spring semester in a Cell and Molecular Biology designated seminar course. Graduate advisory and dissertation committees will consist of at least four program faculty representing at least two different departments. With the approval of the student's Graduate Advisory Committee, up to 6 hours of alternative graduate courses may be used to satisfy the 24 hours of course work. Any student who receives a grade of "D" or "F" in any graduate-level course will be subject to dismissal following review by the Program Advisory Committee. Any student receiving more than two grades of "C" in courses of two or more credit hours is no longer eligible for the Ph.D., but may elect to complete an M.S. degree in the program

Candidates for the Ph.D. who do not meet the requirement for proficiency in spoken English at the time of admission must demonstrate proficiency in spoken English through a university-accepted examination prior to their candidacy exam. English proficiency courses are available at the University of Arkansas to help in this effort. Meeting this language requirement will not only prepare candidates for communication in oral examinations, research groups, national meetings, and interviews, but will also (in conjunction with the written language evaluation) enable students to serve as teaching assistants, providing an alternative mechanism for support in the event that other support is unavailable.

All Ph.D. students must complete the Candidacy Examination. The Candidacy Examination for the Ph.D. will consist of the writing of an original research proposal using the guidelines for a federally funded post-doctoral fellowship (e.g., NIH, NSF, USDA) and an oral examination over the proposal, related subjects, and general knowledge. The written and oral portions of the candidacy examination must be completed within the Ph.D. candidate's first 29 months in this program.

Students in the Ph.D. track will, in collaboration with their Graduate Advisory Committee, select a topic and format for their research proposal

within the two years in the program. The proposal topic is to be within the field of Cell and Molecular Biology but on a subject distinct from the student's Ph.D. research. The written proposal is submitted to the student's Graduate Advisory Committee for evaluation and approval or rejection. Students may submit the proposal more than once. Upon completion of an approved proposal the candidate must then pass an oral examination by the student's Graduate Advisory Committee covering the proposal, related subjects as determined by the examining committee, and general knowledge relevant to research in Cell and Molecular Biology.

Only upon satisfactory completion of the proposal and oral examination, as judged by the student's Graduate Advisory Committee, does a student become a candidate for the Ph.D. Students who fail to complete the candidacy examination in the allotted time will be dropped from the Ph.D. program but may choose to become candidates for the M.S. The Ph.D. is granted not only for fulfillment of technical requirements but also for development and possession of critical and creative thought abilities in the areas of Cell and Molecular Biology. Evidence of these abilities is given through the completion of a dissertation. The student's Graduate Dissertation Committee will evaluate the dissertation and conduct an oral Final Examination of the candidate over the dissertation and any other subject matter deemed appropriate by the committee. Administration of the final oral defense will follow the Graduate School guidelines outlined in the Graduate Catalog. Just prior to the Final Examination, the Ph.D. candidate will present a public seminar announced to all CEMB faculty and students.

Students should also be aware of Graduate School requirements with regard to doctoral degrees ([http://catalog.uark.edu/graduatecatalog/degree\\_requirements/#phdandeddgreestext](http://catalog.uark.edu/graduatecatalog/degree_requirements/#phdandeddgreestext)).

## Graduate Faculty

### A

**Adams, Paul D.**, Ph.D. (Case Western Reserve University), B.S. (Louisiana State University), Associate Professor, Department of Chemistry and Biochemistry, 2006.

**Alverson, Andrew James**, Ph.D. (University of Texas at Austin), M.S. (Iowa State University), B.S. (Grand Valley State University), Assistant Professor, Department of Biological Sciences, 2012.

**Anthony, Nick**, Ph.D. (Virginia Polytech Institute and State University), M.S., B.S. (The Ohio State University), Professor, Department of Poultry Science, 1990.

### B

**Barabote, Ravi Damodar**, Ph.D. (Texas Tech University), M.S. (Madurai Kamaraj University, Madurai, India), B.S. (Osmania University, Hyderabad, India), Assistant Professor, Department of Biological Sciences, 2012.

**Baum, Jamie I.**, Ph.D., B.S. (University of Illinois-Urbana-Champaign), Associate Professor, Department of Food Science, 2011.

**Bluhm, Burt H.**, Ph.D., M.S. (Purdue University), B.S. (University of Oklahoma), Associate Professor, Department of Plant Pathology, 2008.

**Bottje, Walter G.**, Ph.D. (University of Illinois-Urbana-Champaign), M.S. (Southern Illinois University), B.S. (Eastern Illinois University), Professor, Department of Poultry Science, 1985.

**Burgos, Nilda Roma**, Ph.D., M.S. (University of Arkansas), B.S. (Visayas State College of Agriculture-Philippines), Professor, Department of Crop, Soil and Environmental Sciences, 1998.

### C

**Correll, Jim**, Ph.D., M.S. (University of California-Berkeley), B.S. (Pennsylvania State University), Distinguished Professor, Department of Plant Pathology, 1989.

### D

**Donoghue, Dan**, Ph.D. (Texas A&M University), M.S. (Brigham Young University), B.S. (Medical University of South Carolina), Professor, Department of Poultry Science, 2000.

**Douglas, Michael Edward**, Ph.D. (University of Georgia), M.S., B.S. (University of Louisville), Professor, Department of Biological Sciences, 2011.

**Douglas, Marlis R.**, Ph.D., M.S., B.S. (University of Zurich), Professor, Department of Biological Sciences, 2012.

**Dowling, Ashley Patrick Gregg**, Ph.D. (University of Michigan-Ann Arbor), B.S. (University of Arizona), Associate Professor, Department of Entomology, 2008.

**Du, Yuchun**, Ph.D. (Kagoshima University, Japan), B.S. (Shaanxi University of Technology, China), Associate Professor, Department of Biological Sciences, 2007.

**Durdik, Jeannine M.**, Ph.D. (Johns Hopkins University), B.S. (Purdue University), Professor, Department of Biological Sciences, 1994.

### E

**Erf, Gisela F.**, Ph.D. (Cornell University), M.S., B.S. (University of Guelph, Canada), Professor, Department of Poultry Science, 1994.

**Etges, William J.**, Ph.D. (University of Rochester), M.S. (University of Georgia), B.S. (North Carolina State University), Professor, Department of Biological Sciences, 1987.

### G

**Goforth, Robyn**, Ph.D., B.S. (University of Arkansas), Research Assistant Professor, Department of Biological Sciences, 2001.

**Goggin, Fiona**, Ph.D. (University of California-Davis), B.S. (Cornell University), Professor, Department of Entomology, 2001.

### H

**Hargis, Billy M.**, Ph.D., D.V.M. (University of Minnesota-Twin Cities), M.S. (University of Georgia), B.S. (University of Minnesota), Distinguished Professor, Department of Poultry Science, 2000.

**Henry, Ralph Leroy**, Ph.D., M.S. (University of Florida), B.S.E. (University of Kansas), Distinguished Professor, Department of Biological Sciences, 1996.

**Hestekin, Christa**, Ph.D. (Northwestern University), B.S.Ch.E. (University of Kentucky), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2006.

**Hettiarachchy, Navam S.**, Ph.D. (University of Hull, England), M.S. (Edinburgh University, Scotland), B.S. (University of Madras, India), University Professor, Department of Food Science, 1992.

### K

**Koeppel, Roger E.**, Ph.D. (California Institute of Technology), A.B. (Haverford College), Distinguished Professor, Department of Chemistry and Biochemistry, 1979.

**Kong, Byungwhi**, Ph.D., M.S. (University of Minnesota-Twin Cities), B.S. (Korea University), Associate Professor, Department of Poultry Science, 2006.

**Korth, Ken L.**, Ph.D. (North Carolina State University), B.S. (University of Nebraska), Professor, Department of Plant Pathology, 1999.

**Kuenzel, Wayne J.**, Ph.D. (University of Georgia), M.S., B.S. (Bucknell University), Professor, Department of Poultry Science, 2000.

**Kwon, Young Min**, Ph.D. (Texas A&M University), M.S., B.S. (Seoul National University), Associate Professor, Department of Poultry Science, 2002.

**L**

**Lay, Jackson**, Ph.D. (University of Nebraska-Lincoln), Professor, Department of Chemistry and Biochemistry, 2002.

**Lehmann, Michael Herbert**, Ph.D., Diploma in Biology (Philipps University of Marburg, Germany), Associate Professor, Department of Biological Sciences, 2002.

**Lessner, Daniel J.**, Ph.D. (University of Iowa), B.S. (University of Wisconsin-Stevens Point), Associate Professor, Department of Biological Sciences, 2008.

**Lewis, Jeffrey A.**, Ph.D. (University of Wisconsin-Madison), B.S. (University of California-Santa Barbara), Assistant Professor, Department of Biological Sciences, 2013.

**M**

**McIntosh, Matt**, Ph.D. (Pennsylvania State University), B.A. (Virginia Tech), Professor, Department of Chemistry and Biochemistry, 1996.

**McNabb, David S.**, Ph.D. (Louisiana State University Health Sciences Center), B.S. (University of Texas at Arlington), Associate Professor, Department of Biological Sciences, 2000.

**Millett, Francis**, Ph.D. (Columbia University), B.S. (University of Wisconsin), Distinguished Professor, Department of Chemistry and Biochemistry, 1972.

**P**

**Paul, David W.**, Ph.D. (University of Cincinnati), B.S. (Southwestern University), Associate Professor, Department of Chemistry and Biochemistry, 1980.

**Pereira, Andy**, Ph.D. (Iowa State University), M.S. (Indian Agricultural Research Institute, India), B.Sc.Ag. (Govind Ballabh Pant University of Agriculture and Technology, India), Professor, Department of Crop, Soil and Environmental Sciences, 2011.

**Pinto, Ines**, Ph.D. (Louisiana State University Health Sciences Center), M.S., B.S. (University of Chile), Associate Professor, Department of Biological Sciences, 2000.

**R**

**Rhoads, Douglas Duane**, Ph.D. (Kansas State University), M.A., B.A. (Wichita State University), University Professor, Department of Biological Sciences, 1990.

**Ricke, Steven C.**, Ph.D. (University of Wisconsin-Madison), M.S., B.S. (University of Illinois), Professor, Department of Food Science, 2005.

**Rorie, Rick**, Ph.D. (Louisiana State University), M.S., B.S. (University of Arkansas), Professor, Department of Animal Science, 1989.

**Rosenkrans, Charles F.**, Ph.D. (Kansas State University), M.S., B.S. (University of Missouri-Columbia), Professor, Department of Animal Science, 1991.

**S**

**Sakon, Joshua**, Ph.D. (University of Wisconsin-Madison), B.S. (Southern Oregon University), Professor, Department of Chemistry and Biochemistry, 1997.

**Smith-Blair, Nancy J.**, Ph.D. (University of Kansas), M.S.N. (Northwestern State University), B.S.N. (Texas Christian University), Associate Professor, Eleanor Mann School of Nursing, 1994.

**Srivastava, Vibha**, Ph.D. (Jawaharlal Nehru University, New Delhi), M.S. (Govind Ballabh Pant University of Agriculture and Technology), B.S. (D.E.I. University), Professor, Department of Crop, Soil and Environmental Sciences, 2001.

**Stites, Wesley**, Ph.D. (Massachusetts Institute of Technology), M.A., B.A. (Johns Hopkins University), Professor, Department of Chemistry and Biochemistry, 1991.

**Szalanski, Allen Lawrence**, Ph.D. (University of Nebraska-Lincoln), M.S. (Kansas State University), B.S. (University of Manitoba), Professor, Department of Entomology, 2001.

**T**

**Thallapuram, Suresh**, Ph.D. (Osmania University), Professor, Department of Chemistry and Biochemistry, 2003.

**Tipsmark, Christian K.**, Ph.D., M.S. (University of Southern Denmark), Associate Professor, Department of Biological Sciences, 2010.

**Tzanetakis, Ioannis E.**, Ph.D. (Oregon State University), M.S., B.S. (Agricultural University of Athens, Greece), Professor, Department of Plant Pathology, 2008.

**W**

**Wideman, Robert F.**, Ph.D. (University of Connecticut), B.A. (University of Delaware), Professor, Department of Poultry Science, 1993.

**Wilkins, Charles L.**, Ph.D. (University of Oregon), B.S. (Chapman College), Distinguished Professor, Department of Chemistry and Biochemistry, 1998.

**Wolchok, Jeffrey Collins**, Ph.D. (University of Utah), M.S., B.S. (University of California at Davis), Associate Professor, Department of Biomedical Engineering, 2011.

**Courses****CEMB 590V. Special Topics in Cell and Molecular Biology. 1-6 Hour.**

Consideration of new areas in Cell and Molecular Biology not yet treated adequately in textbooks or in other courses. May be repeated for up to 6 hours of degree credit.

**CEMB 5911. Seminar in Cell and Molecular Biology. 1 Hour.**

Discussion of current topics in Cell and Molecular Biology. All graduate students in the Cell and Molecular Biology degree program must enroll every fall and spring semester in this course or an approved alternate seminar course. Prerequisite: Graduate standing. May be repeated for degree credit. This course is cross-listed with BIOL 5001.

**CEMB 600V. Master's Thesis. 1-6 Hour.**

Master's thesis. Prerequisite: Graduate standing. May be repeated for degree credit.

**CEMB 700V. Doctoral Dissertation. 1-18 Hour.**

Doctoral dissertation. Prerequisite: Graduate standing. May be repeated for degree credit.