

Olga Ruiz Kopp

Professor of Biology
Utah Valley University
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Orem, UT 84058

EDUCATION

- Ph.D. 2001. Emphasis: Plant Biology. Dissertation: Enhancer and gene trap analysis of the light signaling circuitry in *Arabidopsis thaliana*. Advisor: Dr. Albrecht von Arnim
University of Tennessee, Knoxville
- M.S. 1996. Emphasis: Plant Tissue culture. Thesis: Heavy metal, salts and osmotic pressure effect on shoot regeneration from leaf explants of *Dendranthema grandiflora*. Advisor: Dr. Robert N. Trigiano
University of Tennessee, Knoxville
- B.S. 1991. Thesis: In vitro propagation of *Statice* (*Limonium sinuatum* Mill.). Advisor: Dr. Margarita Perea Dallos
Universidad Nacional de Colombia, Bogotá

ACADEMIC POSITIONS

- Professor Utah Valley University, Orem, UT.
Fall 2017-present
- Associate Professor Utah Valley University, Orem, UT.
Fall 2009-Present
- Assistant Professor Utah Valley State College, Orem, UT.
Fall 2003-2009
- Invited Research Professor Michigan State University. Chloroplast 2010 Project.
Summer 2007
- Post-Doctoral Research Associate University of Tennessee, Knoxville, TN.
Spring 2002-Fall 2003.

OTHER TEACHING EXPERIENCE

- Graduate Teaching Assistant University of Tennessee, Knoxville, TN.
Fall 1995 – Fall 2001.

Teaching Assistant

Universidad Nacional de Colombia
Plant tissue culture laboratory
Spring 1989 – Spring 1991.

PUBLICATIONS: (* indicates undergraduate students)

- Lopatto D., Rosenwald AG, DiAngelo JR...Kopp OR... Leung W, Reed LK and Elgin SCR. 2019. Facilitating Growth through frustration: Using genomics research in a course-based undergraduate research experience: Formative frustration Is an Element of CUREs". Journal of Microbiology and Biology Education. Accepted for publication.
- Pandey, V.N., Chauhan, V., Pandey, V.S., Upadhyaya, P.P. and Kopp, O.R. 2019. Moringa oleifera Lam.: A biofunctional edible plant from India, Phytochemistry and medicinal properties. Journal of Plant Studies 8(1): 10-19.
- Arendt A., Tolman A, Sotomayor M., **Kopp O.**, Aguilera A. 2018 Scholarly and Creative Undergraduate Learning Partnership Team (SCULPT): Triple areas of focus. It Works for Me with High Impact Practices – A step by step guide. Sweet C., Blythe H & Carpenter R. High impact practices. Accepted for publication January 18, 2018. <http://studio.eku.edu/call-proposals-it-works-me-high-impact-practices-0>
- Arendt A., Tolman A, Sotomayor M., **Kopp O.**, Aguilera A. 2018 Scholarly and Creative Undergraduate Learning Partnership Team (SCULPT): Triple areas of focus. It Works for Me with High Impact Practices – A step by step guide. Sweet C., Blythe H & Carpenter R. High impact practices.
- Beck, S*., Mathison H*., Todorov T*, **Kopp OR.** 2018. A review of the Phytochemistry and Ethnopharmacology of *Tridax procumbens* (L.) L. Journal of Plant Studies 7(1): 19-35.
- Chamberlain TJ*, **Kopp OR.** 2018. Kava: An ethnobotanical review of *Piper methysticum*. The Journal of the Utah Academy of Sciences, Arts and Letters.
- Elgin S., Hauser C., Holsen TM, Jones CJ, Kleinschmit, Leatherman. Contributing author, among others:..**Kopp, O.R.**, ...Zhou L. (2016). The GEP: Crowd-Sourcing Big Data Analysis with Undergraduates. Trends in Genetics. <https://doi.org/10.1016/j.tig.2016.11.004>
- Todorov, T*., Zauner, R*., and **Kopp, O.R.** (2016). Astragalus: A Review of its medicinal uses and health effects. Advances in Medicine and Biology, Volume 100. Berhardt L.V. (Editor). Chapter 1. Nova Publishers. ISBN 978-1-63485-304-0
- Hill, P*., Gutierrez, B*., Carmack, L. and **Kopp O.R.** (2015). Micropropagation of *Astragalus holmgreniorum* (Holmgren milkvetch), an endemic and endangered species. **Plant Cell Tiss. Organ Cult.** 121: 371-387. <https://doi.org/10.1007/s11240-015-0708-4>
- Leung, W., Shaffer, C.D....**Kopp, O.R.** ... Elgin, S.C.R. (2015). Drosophila Muller F elements maintain a distinct set of genomic properties over 40 million years of evolution. **Genes/Genomes/Genetics.** March 4, 2015. DOI: 10.1534/g3.114.015966
- Beck, S*., Todorov, T*., and **Kopp, O.R.** (2015). Induction of callus on *Capsicum annuum*: the first step toward micropropagation. The Journal of the Utah Academy of Sciences, Arts, & Letters. Vol 91: 31-41.
- Lopatto,D., Hauser, C, ... Silver Key, C., Kokan, N.,**Kopp, O.R.**, Kuleck, G.A., ... Shaffer,C.D.,Threlfall, J., Elgin, S.C.R) (2014). A Central Support System Can Facilitate Implementation and Sustainability of a Classroom-Based Undergraduate Research Experience

- (CURE) in Genomics. **CBE Life Sciences Education**. 13(4): 711-723 DOI: 10.1187/cbe.13-10-0200
- Shaffer CD, Alvarez CJ, ... Kokan NP, **Kopp O**, Kuleck G, Leatherman J, ... Leung W, Lopatto D, Elgin SCR. (2014). A course-based research experience: How benefits change with increased investment in instructional time. **Cell Biology Education - Life Science Education** 13(1): 111-130. DOI: 10.1187/cbe-13-08 0152
- Kopp, O.R.** (2012) 21st Century Guidebook to Fungi review. *Plant Science Bulletin*. Botanical Society of America. 58(2): 69-70.
- Rawlings D.J*., Hill, P.R*., Gutierrez, B*., Martínez J.C. (**O. Kopp**). (2012). Research in the Classroom: Cloning and sequencing of the GAPDH gene as a tool in the molecular biology classroom. Proceedings of the National Conference on Undergraduate Research (NCUR) 2012. Weber State University, Ogden Utah
- Shaffer CD, Alvarez C, Bailey C, ... Kaehler M, Kokan N, **Kopp OR**, Kuleck GA, McNeil G, ... Mardis ER, Lopatto D, Elgin SCR. (2010). The Genomics Education partnership: successful integration of Research into laboratory classes at a diverse group of undergraduate institutions. **Cell Biology Education-Life Sciences Education**. 9: 55-69. doi: 10.1187/09-11-0087.
- McGowan B* and **Kopp, O.R.** (2009). Bioprospecting in a global environment. The New Globalism. **Proceedings of the 10th Annual Utah Valley University Conference by the Faculty**. Utah Valley University. Pages 40-45
- Kuddus, R.H., J. Oakes*, C.L. Sharp*, J. Scott, K. Slater, J.J. Kirsi, **O.R. Kopp**, W.R. Burt. (2009). Isolation of medically important fungi from *Ginkgo biloba* leaves and crude ginkgo supplements. **The Internet Journal of Microbiology**. Vol 7(1)
<http://ispub.com/IJMB/7/1/5059>
- Lopatto, D., C. Alvares, D. Barnard, C. Chandrasekaran, H.M. Chung, C. Du, T. Eckdahl, A.L. Goodman, C. Hauser, C.J. Jones, **O.R. Kopp**, G.A. Kuleck, ... W. Leung, C.D. Shaffer, J. Buhler, E. Mardis, S.C.R. Elgin. (2008). Genomics Education Partnership. **Science**. 322: 684-685. DOI: 10.1126/Science.1165351.
- Breinholt JW*, Van Buren RV, **Kopp OR**, Stephen CL. (2009). Population Genetic structure of an endangered Utah endemic *Astragalus ampullarioides* (Fabaceae) (Welsh) Welsh. **American Journal of Botany** 96(3): 661-667. DOI: 10.3732/ajb.0800035
- Jarvis, D. E., **O.R. Kopp**, E.N. Jellen, M.A. Mallory, J. Pattee, A. Bonifacio, C.E. Coleman, M.R. Stevens, D.J. Fairbanks, P.J. Maughan. (2008). Simple Sequence Repeat Marker Development and Genetic Mapping in Quinoa (*Chenopodium quinoa* Willd.). **Journal of Genetics** 87(1): 39-51 DOI: 10.1007/s12041-008-0006-6
- Normand P, Lapierre P, Tisa LS, Gogarten JP, Alloisio N, Bagnaron E, Bassi CA, Berry AM, Bickhart DM, Choisine N, Couloux A, Cournover B, Cruveiller S, Daubin V, Demange N, Francino MP, Goltsman E, Huang Y, **Kopp OR**, Labarre L, Lapidus A, Lavire C, Marechal J, Martinez M, Mastronunzio JE, Mullin BC, Nieman J, Pujic P, Rawnsley T, Rouy Z, Schenowits C, Sellstedt A, Tavares F, Tomkins JP, Vallenet D, Valverde C, Wall LG, Wang Y, Medigue C, Benson DR. (2007) Genome characteristics of facultative symbiotic *Frankia* sp. strains reflect host range and host plant biogeography **Genome Res**. 17(1): 7 – 15 DOI: 10.1101/gr.5798407
- Kopp, O.R.**, Samson, A., Wilson-Ashworth, H. (2007). Lab Manual. College Biology I. Biology 1610. Pearson Custom Publishing.

Kopp, O. (2007). Historical review of unethical experimentation in humans. Ethics in the professions. **Proceedings of the 8th annual Utah Valley State college conference by the faculty.** Edited by Rick McDonald & David Yells. Pp.2-11

Kuddus R, Oakes J* and **Kopp OR** (2006). Globalization and international molecular biotechnology transfer: Ethical, technological and organizational issues. Spheres of globalization. Proceedings of the Seventh Annual Utah Valley State College Conference by the Faculty.

Ruiz-Marín, O., Augé, R.M. and Trigiano, R.N. (2001) Effect of heavy metals in the regeneration *in vitro* of Chrysanthemum. In: Biotecnología agrícola. M. Perea Dallos (Ed). Editora Guadalupe. Bogotá. pp.89-98.

Stacey, M.G., **Kopp, O.R.**, Kim, T.H. and von Arnim, A.G. (2000). Molecular domain structure of Arabidopsis COPI. Reconstitution of activity by fragment complementation and mutational analysis of a nuclear localization signal *in planta*. **Plant Phys.** 124(3): 979-990.

PUBLICATIONS BY MENTORED STUDENTS*

Brittain, Hunter*; Echols, McKay*; Fletcher, Nathan*; Medved, Zach*; Robles, Francisco*; Kopp, Olga. 2019. Paper accepted for publication: Proceedings of the Utah Academy of Sciences, Arts and Letters. Accepted December 2019.

Harris, Caeleb*. Hillock, Tyson*; Humes, Alysa; Orullian, Jedediah*; Neely, Levi*; Johnson, B. **Kopp, O.R.** 2018. Investigation of the synergistic effect of select phytochemical-containing oils and Amphotericin B to inhibit fungal biofilm growth in *Rhizopus oryzae*. Proceedings of the National Conference On Undergraduate Research (NCUR). Edmond, Oklahoma, April 5-7, 2018

Bradley T*, Fulton C*, Gordon J*, Hunter B*. (**Kopp OR Advisor**). 2018. Analysis of the benefits of urban home gardens in Utah County. Inquiry Connections (ICON). UVU. Fall 2017.

Evensen Arthur*, Blain Nathalie*, Belnap C*. (**Kopp OR Advisor**). 2018. Impact of locular gel on the formation of callus in tomato tissue cultures. Inquiry Connections (ICON). UVU. Fall 2017.

PAPER SUBMITTED FOR PUBLICATION (student author*)

Houghton, Sydney*; Meyer, Susan E, and Kopp, Olga R. 2020. *Ex situ* seed production protocol by means of embryo excision for high cue-nonresponsive dormant seeds of the endangered Clay Phacelia. Native Plants Journal. Submitted December 16th, 2020. Waiting for response.

ORAL PRESENTATIONS (*indicates undergraduate students)

Larson, Joseph*; DeNittis, Alyson*; Perez, June*; **Kopp, O.** 2020. Ex vitro rooting and acclimatization for the micropropagation of *Lepidium ostleri*, an edaphic endemic plant species. Botanical Society of America Botany 2020 Virtual. July 27- July 31, 2020.

Brunetti, Bryce*; Escarate, Ashley*; Conway, Matt*; Islam, Mohammed; **Kopp, Olga.** 2020. Are electrohydraulic shockwaves a possible treatment against bacterial biofilms? ., 14th Annual

- Utah Conference on Undergraduate Research (UCUR), Utah State University. February 7th, 2020. Logan, UT. Presented by Bryce Brunetti
- Larson, Joseph*; DeNittis, Alyson*; Perez, June*; **Kopp, O.** 2020 Micropropagation of *Lepidium ostleri*, an Edaphic and Endemic Plant Species., 14th Annual Utah Conference on Undergraduate Research (UCUR), Utah State University. February 7th, 2020. Logan, UT.
- Hillock Tyson*, Anderson Karaleen*, **Kopp Olga**, Sterflinger Katie, Slezak Cyrill, and Slezak Paul. 2019. The Effect of Extracorporeal Shockwave Therapy on Fungal Biofilms. The International Society for Medical Shockwave Treatment (ISMST) International Congress. Beijing, China. May 23-26, 2019.
- Hillock T.**, Anderson K, Kopp O, Sterflinger K, Slezak C, and Slezak P. 2019. Inhibition and Stimulation of *Rhizopus oryzae* Biofilm Growth using Low-Frequency Ultrasound and Extracorporeal Shockwave Therapy. Biology Seminar (Biol 497R), Utah Valley University. Orem, Utah. April 24, 2019.
- Hendricks Kyle*, Barlow Landon*, Hillock Tyson*, Callister Rachel*, Richards Michael*, Neely Levi*, Orullian Jedediah*, and **Kopp Olga**. 2019. *Borrelia burgdorferi* Biofilm: An Investigation into Growth and Control of an Alzheimer's Disease-Associated Bacterium. American Society of Microbiology, Intermountain Branch 2019 Regional Meeting. Provo, Utah. April 13, 2019.
- Callister R***, **Hillock T***, Hendricks K*, Barlow L*, Richards M*, Neely L, Orullian J*, and **Kopp O.** 2019. *Borrelia burgdorferi* Biofilm: An Investigation into Growth and Control of an Alzheimer's Disease-Associated Bacterium. National Conference on Undergraduate Research. Atlanta, Georgia. Annual Conference. April 10-13, 2019.
- Hillock, Tyson*; Anderson, Karaleen*; **Kopp, Olga**; Sterflinger, Katja; Slezak, Cyrill and Slezak, Paul. 2019. Effect of extra-corporeal shockwaves on *Rhizopus oryzae* biofilms. Utah Conference on Undergraduate Research, Weber State University, Ogden, UT. February 22, 2019.
- Callister, Rachel*; Hillock, Tyson*; Hendricks, Kyle*; Richards, Mike*; Barlow, Landon*; Neely, Levi*; Orullian, Jedediah*, **Kopp, Olga**. 2019. Propagation of *Borrelia burgdorferi* biofilms: an Alzheimer's disease-associated bacterium. Utah Conference on Undergraduate Research, Weber State University, Ogden, UT. February 22, 2019. Also presented at NCUR, April 11-13, 2019. Kennesaw State University, Kennesaw, GA.
- Gunnerson, Shane*; Hoehn, Nick*; Neely, Levi*; Hillock, Tyson*; Orullian, Jedediah*; **Kopp, Olga**. 2019. The effect of photodynamic therapy on Mucormycosis-causing *Rhizopus oryzae* fungal biofilms. Utah Conference on Undergraduate Research, Weber State University, Ogden, UT. February 22, 2019.
- Hillock, Tyson*; Anderson, Karaleen* and **Kopp, Olga**. Presentation of biofilm research and training At the Ludwig Boltzmann Institute for Experimental and Clinical Traumatology. Vienna, Austria, June 15-June 22, 2018
- Anderson, Karaleen*; Hillock, Tyson*; **Kopp, Olga**. Bologna, Italy June 23-June 30th, 2018 – conference the 5th ISMST basic research meeting: “physical tissue stimulation” - organized by the Ludwig Boltzmann Institute.
- Anderson, Karaleen*; Hatch, Mariel*; **Olga R. Kopp**; Doyle, Timothy. 2018. Synergistic antifungal activity of amphotericin B, essential oils and low frequency ultrasound on *Rhizopus oryzae* biofilm. IUPESM World Congress on Medical Physics and Biomedical Engineering. June 3-8, 2018. Prague, Czech Republic. Contribution ID: 110 (Diagnostic and Therapeutic Instrumentation; Therapeutic systems.

- Hatch, Mariel*; Anderson, Karaleen*; **Kopp, Olga**; Doyle, Timothy. 2018. SG 16(P31)- Synergistic antifungal activity of amphotericin B, essential oils, and low-frequency ultrasound on *Rhizopus oryzae* biofilm. Ultrasonics. Third International Caparica Conference on Ultrasonic-Based applications: From analysis to synthesis. June 11-14, 2018. Caparica, Portugal. 2018_Caparica@US
- DeNitis, Alyson*, **Olga R. Kopp**. 2018. Micropropagation of two edaphic species, *Lepidium ostleri* and *Eriogonum soredium*. Oral presentation. UCUR. Southern Utah University. February 9, 2018.
- Anderson, Karaleen*, Hillock, Tyson*, **Kopp, Olga**; Sterflinger, Katjia; Slezak, Cyrill and Slezak, Paul. 2018. Response of *Rhizopus oryzae* biofilm to low frequency ultrasound and extracorporeal shockwave therapy. Bologna, June 28, 2018.
- Harris, Caeleb*; Neely, Levi*, **Kopp, OR**. 2018. Investigation of the synergistic effect of select phytochemical containing oils and amphotericin B to inhibit fungal biofilm growth in *Rhizopus Oryzae*. NCUR. University of Central Oklahoma. April 4-7, 2018.
- Hatch, Mariel*; Anderson, Karaleen*; **Kopp, OR**; Doyle, T. 2018. Synergistic antifungal activity of amphotericin B, essential oils and low-frequency ultrasound on *Rhizopus oryzae* biofilm. University of Central Oklahoma. April 4-7, 2018.
- Chamberlain T* and **Kopp OR**. 2017. Kava: An ethnobotanical monograph on *Piper methysticum*. Utah Academy of Sciences, Arts and Letters. Annual conference, April 7, 2017.
- Anderson K*, Hatch M* and **Kopp OR**. 2017. Synergistic activity of Amphotericin B and thyme oil on the biofilm formation in mucormycosis-causing fungi. Young Researcher Forum category. 4th Global Summit on herbals and traditional medicine. Oral presentation. Osaka, Japan. June 6-8, 2017.
- Evenson A*, **Kopp OR**. 2017. Effect of locular gel removal on the germination of *Solanum lycopersicum*. ASPB (American Society of Plant Biologists) Western Section Annual meeting. Brigham Young University, Provo, May 19-21, 2017
- Zavala B* and **Kopp OR**. 2017. Nemautilli, Depression and PTSD: A comparison of active compounds in plants and medicine used for treatment. Westminster College – McNair Scholars Symposium. July 7, 2017.

POSTER PRESENTATIONS (* indicates undergraduate students)

- Joseph Larson*, June Perez*, Alyson DeNittis* and **Olga R. Kopp**. 2020. In Vitro and Ex Vitro_Rooting for Micropropagation of *Lepidium ostleri*, an Edaphic Endemic Species. Presented by Joseph Larson at UCUR. February 7, 2020.
- Buhler, Nathan*; Stokes, Brittain*; Tyler, Areiann*; Walker, Joshua*; Hoehn, Nick*; **Kopp, Olga**; Thulin, Craig. 2020. Synthesis and analysis of liposomes for antimicrobial treatment. 14th Annual Utah Conference on Undergraduate Research. Utah State University (UCUR), Utah State University. February 7th, 2020. Logan, UT.
- Brunetti, Bryce*; Escarate, Ashley*; Conway, Matthew*; **Kopp, Olga** and Islam, Mohammed. 2020. Synergistic effect of Vancomycin and electrohydraulic shockwaves against *Staphylococcus aureus* biofilms. 14th Annual Utah Conference on Undergraduate Research. Utah State University (UCUR), Utah State University. February 7th, 2020. Logan, UT.
- Babb, Eric*; Nuñez, Carlos*; Sekona, Nanasi; Balderrama, Ashley*; Landefeld, Alissa; **Kopp, Olga**. 2020. An investigation of protein expression from *Rhizopus oryzae* biofilms. 14th

- Annual Utah Conference on Undergraduate Research. Utah State University (UCUR), Utah State University. February 7th, 2020. Logan, UT.
- DeNittis, Alyson*, Larson, Joseph*, Perez, June*. **Kopp, Olga R.** (2019) In Vitro and Ex Vitro Rooting for the Micropropagation of *Lepidium ostleri*, an Edaphic Endemic Plant Species. Poster Presentation, Showcase of Undergraduate Scholarly and Creative Works, Utah Valley University, Orem, UT.
- Anderson Karaleen*, Hillock Tyson*, Hendricks Kyle*, Slezak Paul, Slezak Cyrill, Sterflinger-Gleixner, Katja, and **Kopp O.** 2019. Effect of Extracorporeal Shockwaves on *Rhizopus oryzae* Biofilm. Utah Valley University Showcase of Undergraduate Scholarly and Creative Works. Orem, Utah. October 15, 2019. This was also presented at the Medical Student Research Presentations (MSRP at the University of Utah Medical School). Salt Lake City, UT, October 11, 2019 and at the University of Utah Learning Abroad Research Conference. Salt Lake City, UT, September 19, 2019.
- Anderson Karaleen*, Hillock Tyson*, Hendricks Kyle, Slezak Paul, Slezak Cyrill, Sterflinger-Gleixner, Katja, and **Kopp Olga.** 2019. Effect of Extracorporeal Shockwaves on *Rhizopus oryzae* Biofilm. Utah Valley University Showcase of Undergraduate Scholarly and Creative Works. Orem, Utah. October 15, 2019.
- Brunetti Bryce*, Hillock Tyson*, Frahm A, Slezak C, Slezak P, and **Kopp O.** 2019. Electrohydraulic Shockwaves as a Possible Treatment for Bacterial Biofilms. American Society for Microbiology (ASM) and European Society for Clinical Microbiology and Infectious Diseases (ESCMID) Conference on Drug Development. Boston, Massachusetts. September 3-6, 2019.
- Chelepis, Iryna*; Balderrama, Ashley*; Hillock, Tyson*; Neely, Levi*; Orullian, Jedediah*; **Kopp, Olga.** Anti-fungal Synergistic Effect of Amphotericin B and Posaconazole with Thymol and Cinnamaldehyde against *Rhizopus oryzae* Biofilm. The National Conference on Undergraduate research, Kennesaw State University, Kennesaw, Georgia, April 11 – April 13, 2019
- Chelepis I*, Balderrama A*, Orullian J*, Hillock T*, Neely J*, and **Kopp O.** 2019. Anti-Fungal Synergistic Effect of Amphotericin B and Posaconazole, Thymol and Cinnamaldehyde against *Rhizopus oryzae* Biofilm. National Conference on Undergraduate Research. Atlanta, Georgia. Annual Conference. April 10-13, 2019.
- Chelepis I*, Balderrama A*, Orullian J*, Hillock T*, Neely J*, and **Kopp O.** 2019. Anti-fungal synergistic effect of Amphotericin B and Thymol against *Rhizopus oryzae* biofilm. Utah Academy of Science, Arts, and Letters. Ogden, Utah. Annual Conference. March 23, 2019.
- Balderrama; Ashley*, Chelepis, Iryna*; Hillock*, Tyson; Neely*, Levi; Orullian*, Jedediah; Kopp, Olga. Anti-fungal synergistic effect of Amphotericin B and Thymol against *Rhizopus oryzae* biofilm”, The Utah Conference on Undergraduate Research (UCUR), Weber State University, February 22, 2019
- Gunnerson, Shane*; Hoehn, Nick*; Neely, Amanda*; Hillock, Tyson*; Neely, Levi* and **Kopp, Olga R.** 2019. Investigation of the effect of various intensities of photodynamic therapy on mucormycosis-causing *Rhizopus oryzae* fungal biofilms. National Conference on Undergraduate Research (NCUR), April 11-13, 2019. Kennesaw State University, Kennesaw, GA.
- Brittain, Hunter*; Echols, McKay*; Fletcher, Nathan*; Medved, Zach*; Robles, Francisco*; **Kopp, Olga** 2019. Analyzing attitudes toward the use of essential oils among UVU students. Utah

- Academy of Sciences, Arts and Letters. Annual Conference. March 23, 2019, Weber State University.
- Neely, Levi*; Nomiya, Misae*; Nymeyer, Jake*; Rhee, Hutch*; Roundy, Nathan*; Robles, Francisco* and **Kopp, Olga R.** 2019. Perception analysis of the use of indoor plants and their benefits among college students. Utah Academy of Sciences, Arts and Letters. Annual Conference. March 23, 2019, Weber State University
- Hendricks, Kyle*; Barlow, Landon*; Hillock, Tyson*; Callister, Rachel*; Richards, Mike*; Neely, Levi*; Orullian, Jedediah*, **Kopp, Olga**. 2019. Propagation of *Borrelia burgdorferi* biofilms: an Alzheimer's disease-associated bacterium. Utah Conference on Undergraduate Research, Weber State University, Ogden, UT. February 22, 2019.
- Gunnerson, Shane*; Hoehn, Nick*; Neely, Levi*; Hillock, Tyson*; Orullian, Jedediah*; **Kopp, Olga**. 2019. Investigation of the effect of photodynamic therapy on Mucormycosis-causing *Rhizopus oryzae* fungal biofilms. Utah Conference on Undergraduate Research, Weber State University, Ogden, UT. February 22, 2019.
- Balderrama, Ashley*; Chelepis, Iryna*; Johnson, Blake*; Hillock, Tyson*; Neely, Levi*; Orullian, Jedediah*; **Kopp, Olga**. 2019. Anti-fungal synergistic effect of Amphotericin B and thymol against *Rhizopus oryzae* biofilm. Utah Conference on Undergraduate Research. Weber State University, Ogden, UT. February 22, 2019
- Hillock, Tyson*; Hendricks, Kyle*; Callister, Rachel*; Barlow, Landon*; Richards, Michael*; Neely, Levi*; Orullian, Jedediah*, **Kopp, Olga R.** 2019. *Borrelia burgdorferi* biofilm: An investigation into growth and control of an Alzheimer's associated bacterium.
- Hillock, Tyson*; Anderson, Karaleen*; Sterflinger, Katjia; Slezak, Cyrill; Slezak, Paul, and **Kopp, Olga R.** 2018. Response of *Rhizopus oryzae* biofilm to low frequency ultrasound and extracorporeal shockwave therapy.
- Blain, Nathalie*; Evensen, Arthur* and **Kopp O.R.** 2018. Impact of locular gel on the formation of callus in tomato tissue culture. Utah Academy of Sciences, Arts and Letters. Annual conference. Southern Utah University, April 7, 2018. Cedar City, UT.
- Larsen, Preston*; Teh, Li Szhien*; Sudbury, Ian* and **Kopp, O.R.** 2018. Evaluation of antifungal activity of endophytes in *Ephedra nevadensis*. UCUR. Southern Utah University, Cedar City, UT. February 9, 2018.
- Anderson, Karaleen*; Hatch, Mariel*; Harris, Caeleb*; Ferrin, Jeremiah*; Orullian, Jedediah*; Rhee, Hutch*; **Kopp, O.R.** 2018. Synergistic activity of *cinnamomum verum* (Cinnamon) oil and Amphotericin B on *Rhizopus oryzae* biofilm. UCUR. Southern Utah University, Cedar City, UT. February 9, 2018.
- Anderson, Karaleen*; Hatch, Mariel*; Harris, Caeleb*; Hopkins, Stephanie*; Humes, Alissa*; Rob, Hannah*; Teh, Li-Szhien* and **Kopp, O.R.** 2018. *Cymbopogon flexuosus* (Lemongrass) essential oil and Amphotericin B as antifungal agents against *Rhizopus oryzae* Biofilms. UCUR. Southern Utah University, Cedar City, UT. February 9, 2018.
- Anderson, Karaleen*; Hatch, Mariel*; Harris, Caeleb*; Bravo, Karina*; Hillock, Tyson*; Lyle, Rawlings E*. and **Kopp, O.R.** 2018. Synergistic activity of Amp B and *Eugenica caryophyllus* (Clove) oil against *Rhizopus oryzae* Biofilm. UCUR. Southern Utah University, Cedar City, UT. February 9, 2018.
- Anderson, Karaleen*; Hatch, Mariel*; Harris, Caeleb*; Kiggins, Kendrick*; Matkovska, Anastasiia*; Neely, Levi* and **Kopp, O.R.** 2018. Inhibition of fungal biofilm in species known to cause mucormycosis and studies of the antifungal activity of Amphotericin B and

- Origanum vulgare (oregano) oil. UCUR. Southern Utah University, Cedar City, UT. February 9, 2018.
- Anderson K, Hatch M and **Kopp OR**. 2017. Induction of fungal biofilm in species known to cause mucormycosis and its application to the antifungal activity of Amphotericin B and Thyme oil. Utah Academy of Sciences, Arts and Letters. Annual conference, April 7, 2017.
- Beck Samantha* and **Kopp OR**. 2017. A review of the phytochemistry and ethnopharmacology of *Tridax procumbens*. The International Botanical Congress, Shenzhen, China – July 23-29, 2017.
- Anderson K*, Hatch M* and **Kopp OR**. Studies of synergistic effects of Amphotericin B and essential oils against Mucormycosis-causing fungi. Submitted to the International Botanical Congress, China – July 23-29, 2017
- Anderson K*, Hatch M* and **Kopp OR**. 2017. Synergistic activity of Amphotericin B and thyme oil on the biofilm formation in mucormycosis-causing fungi. Young Researcher Forum category. 4th Global Summit on herbals and traditional medicine. Osaka, Japan. June 6-8, 2017.
- Bastian R*, Carlson A*, Wood J* and **Kopp OR**. 2017. Use of fish oils as complementary and alternative medicine (CAM). Utah Academy of Sciences, Arts and Letters. Annual conference, April 7, 2017.
- White J*, Neeley C*, Fenton C*, Finley S* and **Kopp OR**. 2017. Use of complementary and alternative medicine to remedy stress by Utah Valley University students. Utah Academy of Sciences, Arts and Letters. Annual conference, April 7, 2017.
- Daniels T*, Dodson M*, Horspool J*, Kallas H*. and **Kopp OR**. 2017. An analysis of the use of essential oils and correlation with demographic factors. Utah Academy of Sciences, Arts and Letters. Annual conference, April 7, 2017.
- Anderson K*, Hatch M*, **Kopp O.R.** 2017. Synergistic efficacy of Amphotericin B and essential oils against fungal strains known to cause mucormycosis. Countours of Knowledge. Utah Valley University, March 28, 2017.
- Cotton-Betteridge A, Koller M, Larsen P, Teh, Li S zhen, Richards B and Kopp OR. 2017. Evaluation of antifungal activity of endophytes in *Ephedra nevadensis*. Utah Conference on Undergraduate Research, UVU, Orem, UT. Feb 17, 2017
- Evensen, A., Belnap, C., El-Saidi, M. and **Kopp, O.R.** 2016. Effects of locular gel removal on germination of *Solanum lycopersicum*. Botanical Society of America meeting, July 30-August 3, 2016
- Todorov, T*., Zauner, R*. and **Kopp, O.R.** 2016. Astragalus: Traditional medicinal herb to modern medicine. Botanical Society of America meeting, July 30-August 3, 2016
- Lindow, A*., Cotton-Betteridge*, Peterson D*. and **Kopp, O.R.** 2016. *Ephedra nevadensis* endophytic competition and analysis of antifungal activity. Engaged Learning Week. March 20, 2016.
- Bowers, A*., Smith, D*., and **Kopp, O.R.** 2016. Preliminary studies for induction of polyploidy in *Raphanus sativus*. Engaged Learning Week. March 29, 2016.
- Todorov, T*., Zauner, R*. and **Kopp, O.R.** 2016. Astragalus: A review of its medicinal uses and health effects. Engaged Learning Week. March 29, 2016.
- Harris R*., Carreon J*. and **Kopp, O.R.** 2016. Preliminary studies of organogenesis in *Ocimum basilicum* using Kinetin. 2016. UCUR. SLC. Feb 19,2016.

- Mathison, H*; Beck, S*., Todorov, T*. and **Kopp, O.R.** 2016. A review of the phytochemistry and ethnopharmacology of *Tridax procumbens*. UCUR. SLC Feb 19, 2016.
- Medrano, G.Y*., Tingey C*. and **Kopp, O.R.** 2016. Organogenesis studies in Thai Pepper (*Capsicum annuum*). UCUR, SLC, Feb 19, 2016.
- Beck S* and **Kopp OR** (2015) Micropropagation studies of *Capsicum annum* – Var Moruga Scorpion. Botanical Society of America. Edmonton, Canada. July 25-29, 2015
- Gaffney G*, Stratton S*, Gibbs M* and **Kopp OR** (2015) Preliminary studies of *Ephedra nevadensis* endophytes with potential antibiotic activity. Botanical Society of America. Edmonton, Canada. July 25-29, 2015
- Todorov T*, Tingey C* and **Kopp OR** (2015) Inducing somatic embryogenesis on the Thai (*Capsicum annuum*) callus. Botanical Society of America. Edmonton, Canada. July 25-29, 2015
- Houston L*, Wethall J*, Curtis C*, Kopp O (2014). Analysis of Gene expression in Arachis hypogaea. Botanical Society of America. Boise, Idaho. July 26-30, 2014
- Beck S*, Todorov T* and **Kopp O.R.** (2014) Micropropagation studies of *Capsicum annuum*. Botanical Society of America. Boise, Idaho. Idaho. July 26-30, 2014
- Velasco MJ* and **Kopp OR** (2014) Propagation studies of Calochortus species. UCUR – February 28, 2014. BYU Provo.
- Houston L*, Mead J*, Curtis C* and **Kopp O** (2014) Preliminary gene expression studies of Ara h1 and Ara h2 in peanuts (Arachis hypogaea). UCUR – BYU Provo.
- Worthington I*, **Kopp OR**. 2013. Biofuels: Engineering Anabaena for Methylbutanol production. NCUR – University of Wisconsin – La Crosse, April 11-13, 2013.
- Tregaskis D*, Cook C*, Smiley J*, North T* and **Kopp OR** (2013) Construction of a scytonemin-GFP reporter vector for analysis of gene expression in Fremyella diplosiphon. UCUR, Utah State University, Logan, February 22, 2013.
- Worthington I*, Zhou R, Chen K and **Kopp O.R.** (2013) Genetic engineering of cyanobacteria to produce methyl butenol. NCUR and UCUR poster presentation. UCUR – Utah State University, Logan February 22, 2013.
- Worthington I*, **Kopp OR**. 2013. Biofuels: Engineering Anabaena for Methylbutanol production. NCUR – University of Wisconsin – La Crosse, April 11-13, 2013.
- McGowan B A*, Babaoka J* and **Kopp OR** (2012) Micropropagation of Astragalus holmgreniorum. UCUR.
- Jenson WT*, Ramirez MR* and **Kopp OR** (2012) Scytonemin studies and long-term storage of Fremyella diplosiphon. UCUR- Weber State University- February 2012.
- Told J,* Cook C.* (2012). Analysis of the effect of different wavelenghts of light in the growth of *Fremyella diplosiphon*. Botanical Society of America meeting. July 2012
- Rawlings DJ*, Hill PR*, Gutierrez B*, Martinez JC*, Smith TA*, Abreau SD* and **Kopp OR** (2012) Cloning and sequencing the GAPC gene in the undergraduate molecular biology classroom. Botanical Society of America meeting. July 2012.
- Martinez JC*, Hill PR*, Gutierrez B*, Smith TA*, Abreau SD.*, **Kopp OR.** (2012) JCMII poster presentation. March 22, 2012.
- Ramirez M* and Jenson WT* (2012). Isolation of Scytonemin, a UV-blocking compound in cyanobacteria *Fremyella diplosiphon*. UCUR, Weber State.
- Rawlings DJ,* Hill PR,* Gutierrez B*, Martinez JC*, Smith TA*, Abreau SD* and **Kopp OR** (2012) Research in the classroom: cloning and sequencing the GAPC gene from multiple

- plant species in the undergraduate learning of molecular biology. NCUR. 2012.
https://ncurdb.cur.org/ncur2016/archive/Display_NCUR.aspx?id=63000
- Cook C*, Told J*, **Kopp OR** (2012). The morphological plasticity in *Fremyella diplosiphon* when exposed to low nutrient growth media. UCUR poster presentation. July, 2012.
- Gutierrez B*, Hill P* and **Kopp OR**. (2011) Fungal Pathogens of *Pinus longaeva*. UCUR conference.
- Fry, A.R.*, McGowan BA*, Babaoka, J.* Searly A, Van Buren R. and **Kopp OR**. (2009) In vitro propagation studies in *Astragalus holmgreniorum*. Fifth Southwest Rare Plant Conference: Changing Landscapes in the Southwest. Salt Lake City, March 16-20, 2009.
- Fry, A.R.*, McGowan BA*, Babaoka, J.* Searly A, Van Buren R. and **Kopp OR**. (2009) Micropropagation studies in *Astragalus holmgreniorum*. UCUR, Westminster college, February 20, 2009.
- Breinholt JW*, Van Buren R, **Kopp OR** and Stephen CL (2009). Population Genetic structure of an endangered Utah endemic *Astragalus ampullarioides* (Fabaceae) (Welsh) Welsh. 2009. Fifth Southwest Rare Plant Conference: Changing Landscapes in the Southwest. Salt Lake City, March 16-20, 2009.
- Calvin Bell*, Jaron Larsen*, Peter J. Maughan, Michael R. Stevens, Craig E. Coleman, Eric N. Jellen and **Olga R. Kopp**. (2007) Preliminary studies of micropropagation of Quinoa (*Chenopodium quinoa* Willd). Annual Winter Meeting 2008. Western Section of the American Society of Plant Biologists. Utah Valley State College. Orem, UT. February 22 and 23, 2008.
- Jarvis DE*, **Kopp OR**, Jellen EN, Mallory MA*, Pattee J, Bonifacio A, Coleman CE, Stevens MR, Fairbanks DJ, Maughan PJ* (2007) Simple Sequence Repeat Development, Polymorphism and Genetic Mapping in Quinoa (*Chenopodium quinoa* Willd.). McKnight Foundation, Collaborative Crop Research Program Biennial Grantees Conference. Paris, France
- Joshua S. Bentley*, Scott W. Robertson*, **Olga R. Kopp**. 2007. Characterization of the bacterial population of the red gypsiferous soil supporting the growth of the endangered species *Arctomecon humilis*. Utah Conference on Undergraduate Research (UCUR). University of Utah. February 2, 2007. University of Utah. Salt Lake City.
- Joshua S. Bentley*, Scott W. Robertson*, **Olga R. Kopp**. 2007. Characterization of the microbiota of the soil where *Arctomecon humilis* grows. American Society for Microbiology. Annual meeting of the Intermountain Branch. March 10, 2007.
- Olga R. Kopp**, Melanie Mallory*, Christina McArthur*, Justin Pattee*, Eric N. Jellen, Mikel R. Stevens, Daniel J. Fairbanks, Craig E. Coleman, Peter J. Maughan. Development of Microsatellite markers for *Chenopodium quinoa*. Plant and Animal Genomes conference. San Diego, California. January 14-18, 2006.
- Rakesh K. Gupta, John Dunlap, Svetlana V. Dobritsa, Cynthia A. Stiles, Michael E. Essington, Zhaoyang Liu, Chung-Hsuan Chen, Engin H. Serpersu, **Olga Ruiz Kopp** and Beth C. Mullin. Metallohistins: A new class of proteins with potential for use in the development of phytoremediation systems. 13th International Symposium on Frankia and Actinorhizal Plants Durham, NH, Aug. 1-4, 2004.
- Brook Nelson*, **Olga R. Kopp**, Ying Wang & Beth C. Mullin. In search of the biological role of actinorhizal nodulin AgNt84. 13th International Symposium on Frankia and Actinorhizal Plants Durham, NH, Aug. 1-4, 2004.

Lowe, R., B. Blackmon, D. Main, **O.R. Kopp**, B.C Mullin, and J. Tomkins. Development of a Physical Framework for the Frankia Genome. 13th International Symposium on Frankia and Actinorhizal Plants Durham, NH, Aug. 1-4, 2004.

THESIS ADVISOR

Honors Thesis: Jedediah Orullian. The synergistic activity of Thymol and Cinnamaldehyde with Amphotericin B and Posaconazole against *Rhizopus oryzae* biofilms. Utah Valley University Thesis Database. Defense: April 25, 2019. Co-Advisor: Steve Chamberland.

INVITED SPEAKER:

- Kopp O.R. Undergraduate research opportunities in Botany. Presented to the Botany club, January 31, 2020.
- **Kopp, O.R.** Biofilms and medical applications. Ludwig Boltzmann Institute for Experimental and Clinical Traumatology. Vienna. June 20, 2018.
- **Sixth Annual Scholarship of Teaching & Engagement (SoTE) conference at UVU – 2016:** Reducing the drudgery of “Group work” with Team-Based. March 27, 2016.
- **Science Association of Women – Club Activity – 2014 - Women in science research.** November 14, 2014. Room SB 136.
- **Scholarship of Teaching and Engagement (SoTE) conference.** 2013. Harnessing the Power of student engagement with Team-Based Learning. Andersen B, Emerman S and **Kopp O.** 2013 March 28-29, 2013. Utah Valley University.
- **UVU Pre-Freshman Engineering Program (PREP)** –June 2013 and July 2014 Carnivorous plants, June 21, 2013 and July 2014.
- **Second Annual Intermountain PreMed and Pre-PA Conference – 2012 –:** Research opportunities for undergraduates. Utah Valley University, May 18, 2012.
- **Utah Rare Plant meeting –** March 9th, 2010, University of Utah. Presentation: *Astragalus holmgreniorum*, Utah’s and Arizona’s Endemic species. Aaron R. Fry, Brett A. McGowan, Julianne Babaoka, Ally Searly, Renee Van Buren and **Olga R. Kopp.**
- **Tenth Annual Utah Valley University Conference by the Faculty: What Role for the United States in the New Globalism?** The U.S. Role in Bioprospecting in Underdeveloped countries. January 21, 2009.
- **Ethics Awareness week 2009.** Panel discussion on Medical Ethics: Should Nutraceuticals be regulated. September 23, 2009, Library Auditorium LI 120, 12-12:50 p.m.
- **Internship opportunities for undergraduates: December 3, 2008. UVU**
- **Ethics of biotechnology in food agricultural products.** The ethics of handling food in multicultural societies. Panel Discussion on the Ethics Awareness Week. September 17, 2008.
- **Historical Review of unethical experimentation with humans.** The 2007 Ethics Conference. Utah Valley State College.
- **Ethical issues of agricultural plant biotechnology.** September 21, 2006. At the: Ethics of biotechnology and bioengineering issues. Ethics awareness week, UVU.
- **Research and internship opportunities for undergraduates.** Organized by the Pre-Med club. February 17, 2006

- **Teaching DNA Science:** Resources available at the DNA learning center (CSHL) for high school and undergraduate education. Biology Seminar. September 22, 2004.
- **GTA seminar on college teaching 2000.** Participated as part of the panel entitled "Outstanding GTAs discuss teaching". Knoxville, August 16, 2000 and August 19, 1998 (University of Tennessee).
- **Second National Meeting of Plant Biotechnology** organized by Aceviv (Colombian Association for Plant Tissue Culture). Bogotá, June 1991.

AWARDS

- Outstanding Educator of the Year Award 2017-2018.
- Presidential Award of Excellence – Engagement. 2017
- Higher Education Academy – Senior Fellow – in recognition of attainment against the UK Professional Standards Framework for teaching and learning support in higher education. PRI07027 – 10/10/2016
- College of Science and Health Dean’s Award of Excellence – Scholarship. February 2016.
- UVU Department of Biology – Outstanding Faculty – 2014-2015.
- Nomination for the Council on Undergraduate Research – Biology Division Mentor Awards. UVU - September 2015.
- Board of Trustees Award of Excellence, UVU 2009-2010 (May 2010)
- UVU Thinks Big – Utah Valley University – September 22, 2011
- Nomination for the Faculty Excellence Award in the College of Science and Health – UVU 2010.
- Wolverine Achievement Award- Full Time Faculty of the Year (finalist) 2009-2010.
- Outstanding Educator of the Year Award. UVU. 2007-2008.
- Teacher of the Semester Award (Athletes’ choice) – Spring 2005
- Nomination for Faculty of the year award. UVU 2007.
- Nomination for Faculty of the year award. UVU 2006
- Summer Faculty NSF fellowship – Cold Spring Harbor Laboratory, July 12-30, 2004.
- Arthur E. Yates Graduate Fellowship – Academic year 2000-2001. University of Tennessee, Knoxville.
- Chancellor's Outstanding GTA Award. University of Tennessee, Knoxville.1998.
- The Raymond W. Holton Graduate Student Teaching Award. University of Tennessee-Knoxville. Academic Year 1998-1999.

WORKSHOPS ATTENDED

- Course Undergraduate Research Experience (CURE) workshop – University of West Alabama. October 28-29, 2016. Livingston, AL. Organizer: Dr. Mustafa Morsey. Training done by Dr. Erin Dolan, Director of the Texas Institute for Discovery Education in Science.
- Council of Undergraduate Research (CUR) workshop – Institutionalizing Undergraduate Research. University of San Diego – April 10-12, 2015.
- Ninth Annual Utah Conference on Undergraduate Research: February 27, 2015. Poster presentation – (students presenting: Samantha Beck and Toma Todorov: Micropropagation of *Capsicum annuum*) – Dixie State University, St. George.

- Sixth Annual Scholarship of Teaching and Engagement conference at UVU. March 27-March 28, 2014.
- Science Education for New Civic Engagements and Responsibilities (SENCER) – 2013. Santa Clara University, August 1-5, 2013
- Fourth Annual Scholarship of Teaching and Engagement Conference, Reaching New Heights Through Engagement. 2012 - Utah Valley University, March 22-23, 2012.
- Mythinkinglab training. Measuring your students' learning: Gathering and analyzing student success data. March 30, 2012. Organized by Pearson Education.
- Third Annual Scholarship of Teaching and Engagement Conference. Utah Valley University, March 25-26, 2011 (presented research about Mastering Biology and student success).
- Teaching Academy – 2010. UVU Center for Teaching Excellence.
- National Association of Biology Teachers. Memphis, TN. October 15-18, 2008. Attended a variety of teaching workshops.
- Tradeline – Leading Edge Resources for Facilities Planning and Management. 2008. October 27-October 28, 2008. San Diego, CA.
- American society for Microbiology. Annual meeting of the Intermountain Branch. March 10th, 2007. Idaho State University.
- Council for Undergraduate Research: Institutionalizing Undergraduate Research. October 13-15, 2006. Harvey Mudd College. Claremont, CA.
- Institute in Functional Genomics and Bioinformatics. Funded by the National Science Foundation: July 31- August 4, 2006. University of California Davis.
- Genome Annotation workshop: Washington University – St. Louis. June 18-20, 2006 Funded by NSF.
- Plant and Animal Genome XIV conference. San Diego. January 14,-18, 2006
- GCAT – NSF supported DNA microarrays workshop. Morehouse College, Biology Department. Atlanta, GA. July 27- August 1, 2005.
- Bridging research and teaching workshop: June 21, 2005. Washington University. St. Louis.
- Teaching workshop: Model organisms to Bedside. June 22-24, 2005. Washington University, St. Louis.
- Case Studies in Science Summer workshop. University at Buffalo, State University of New York. May 23-27, 2005.
- National Science Foundation Fellowship. Summer 2004. Cold Spring Harbor July 12-30, 2004. Training in teaching plant molecular genetics and genomics.
- Embryogenesis: Molecules, morphogens and mountains: Southwest and Gulf Regional society for Developmental Biology Meeting. September 19-21, 2003. Salt Lake City, UT.
- Bioquest summer workshop: Biocomplexity in undergraduate education: from hard data to hard decisions. June 15-23, 2002. Beloit College. Beloit, WI.
- Science with Fast Plants. University of Wisconsin, Madison. January 14-16, 2000.

WORKSHOPS ORGANIZED

- Annual Winter meeting of the Western Section of the American Society of Plant Biologists. February 22 and 23, 2008.
- Plant molecular Genetics and bioinformatics workshop. 2007 for high school teachers in Utah (collaboration with Cold Spring Harbor Laboratory).

- Bioinformatics workshop at UVSC taught by staff from the National Center for Biotechnology Information (NCBI- Washington). August 14 and 15, 2006.
- Organized a Plant Molecular Genetics and Bioinformatics workshop for High School and Junior College Faculty in collaboration with the Dolan DNA Learning Center (Cold Spring Harbor Laboratory). June 6-8, 2005.

TEACHING

Courses taught at UVU:

- BIO 1010 – General Biology for non-majors.
- BIO 1610 – College Biology
- BIO 494R – Seminar
- BOT 4430 – Plant Pathology
- BOT 4600, 4605 – Plant Physiology and Plant physiology laboratory
- BOT 4700 – Plant Tissue Culture
- BOT 3800 – Ethnobotany
- BIO 489R – Student Research
- BIO 499R – Senior Thesis