

## CONTACT INFORMATION

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Asaph B. Cousins  
Assistant Professor  
School of Biological Sciences  
Washington State University  
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## EDUCATION

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Ph.D., Plant Biology, 2001, Arizona State University, Tempe AZ Dissertation title: "*Photosynthesis in Sorghum Bicolor under Free-Air Carbon Dioxide Enrichment and Water Stress*"  
B.S., Biology, 1996, California State University Chico, Chico CA  
Minors in: Natural Resource Management & Chemistry

## PROFESSIONAL ACADEMIC EXPERIENCE

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Assistant Professor, School of Biological Sciences,  
Washington State University 2008-present  
Postdoctoral Research Associate, ARC Centre of Excellence in Plant Energy Biology,  
Australian National University 2006-2007  
NSF Postdoctoral Fellow,  
Australian National University, 2004-2006  
Postdoctoral Research Associate,  
UC Davis, 2002-2004  
Research Assistant,  
Arizona State University, 2001-2002  
NSF Graduate Research Training Fellow,  
Arizona State University, 1997-2001

## FUNDING

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### Current Support

Department of Energy, Office of Biological and Environmental Research *A systems-level analysis of drought and density response in the model C4 grass Setaria viridis. (co-PI, submitted through the Danforth Center, Saint Louis, MO) \$12,140,437 total, \$1,270,669 to WSU 2012-2017*  
Department of Energy: *Disruption of the CO<sub>2</sub> concentrating mechanism in C<sub>4</sub> plants: Implications for CO<sub>2</sub> fixation and photosynthetic efficiency during C<sub>4</sub> photosynthesis* \$510,000 **(sole-PI) 2012-2015**  
Bill and Melinda Gates Foundation *Supercharging rice photosynthesis- renewal.* \$256,374 to WSU **(co-PI with Gerry Edwards, SBS) 2012-2015**  
National Science Foundation: *Plant Energy Metabolism and Carbon/Nitrogen Assimilation.* \$498,308 **(sole-PI) 2009-2013** Under no cost extension  
National Science Foundation: *MRI: Acquisition of instrumentation to study stable isotopes of the carbon, nitrogen, and water biogeochemical cycles.* \$515,296 **(lead-PI, co-PIs: Evans, RD (SBS), Keller K (SEES), Orr C (SEES), Mount G (LAR)), 2009-2012**

### Pending

National Science Foundation: IOS pre-proposal *Phylogenetic Insights into Leaf CO<sub>2</sub> and H<sub>2</sub>O isotope exchange.* Resubmission to NSF January 2013 \$483,868 (sole-PI) *Third submission- previous reviews were 3 very good, 1 good and 1 excellent on the 2<sup>nd</sup> submission.*  
Pakistan-US Science and Technology Cooperation Program 2012 Joint Project Proposal Morphological,

physiological and biochemical plasticity of single cell C<sub>4</sub>, Kranz type C<sub>4</sub> and C<sub>3</sub> Suaedoideae species in response to environmental variations in light and salinity (co-PI) \$ \$177,142.

#### Grants completed

Department of Energy: *Disruption of C<sub>4</sub> photosynthesis by changes in light quantity and quality: Implications for CO<sub>2</sub> fixation and photosynthetic efficiency in C<sub>4</sub> crop and biofuel species* \$473,000 (**sole-PI**) 2009-2012

Bill and Melinda Gates Foundation *Creating the Second Green Revolution by Supercharging Photosynthesis: C<sub>4</sub>-rice*. \$334,959 (**co-PI** with Gerry Edwards) 2009-2012

U.S. Civilian Research and Development Foundation-*Identifying photosynthetic features of plants, which can reduce the impact of global warming*. \$32,900 (**co-PI** with Gerry Edwards) 2010-2012

U.S. Department of Agriculture *Food Security, WA FY2010* \$256,864 (**co-PI** with PI Cavalieri R. and co-PIs Kirchoff H, Neff M, Edwards GE, Kahn M, Kramer D) 2010-2012

WSU's Research and Graduate Education Equipment Grant *Photosynthetic Phenotyping Array (PPA): a critical step in a new direction for plant sciences at WSU* \$319,777 (co-PI with PI Kramer D and co-PIs Browse J, Burke I, Carter A, Dhingra A, Hulbert S, Knowles NR, Kirchoff H, Lewis NG, Neff M) 2010-2011

#### Funded grants listed as a collaborator

Natural Sciences and Engineering Research Council, Canada *Interactive effects of temperature and CO<sub>2</sub> levels on C<sub>3</sub> and C<sub>4</sub> plants* PI Rowan S (University of Toronto). Postdoc and PI will spend 3-6 months in my lab

Natural Environment Research Council, UK *Rubisco evolution, photosynthesis and plant adaptation to climate change* PIs Filatov D & Smith A (University of Oxford) £529,028 = \$804,096 USD PIs will spend ~9 months in my lab

Department of Energy *Regulation of chloroplast biogenesis: The immutans mutant of Arabidopsis* PI Steve Rodermel (Iowa State University) Collaborator

National Science Foundation *UI-WSU Program in Undergraduate Mathematics and Biology*. (Senior Personnel) \$425,350 Listed as senior personnel

#### **PUBLICATIONS** cited 393 times, <sup>^</sup>from WSU, <sup>#</sup>WSU students or postdocs, <sup>\*</sup>Undergrads

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h-index = 12, Impact factor: high = 29.7, average = 9.7 and low = 2.3 average for plant biology is ~1.2

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<sup>#</sup>Walker B., **Cousins A.B.** (2013) Temperature dependent increases in photorespiratory CO<sub>2</sub> release in *Arabidopsis thaliana*: Implications to leaf CO<sub>2</sub> gas exchange. *Journal of Experimental Biology* Accepted

\*Research and funding exclusively from my lab, involved in design, implementation and writing

Busch F., Sage, T.L., **Cousins, A.B.**, Sage, R.F. (2013) C<sub>3</sub> plants enhance rates of photosynthesis by reassimilating photorespired and respired CO<sub>2</sub>. *Plant, Cell and Environment* 36:200-212

\*Research and funding in part from my lab, involved in design, implementation and writing of gas exchange experiments

<sup>^#</sup>Ubierna N., <sup>#</sup>Sun W., **Cousins A.B.** (2013) The efficiency of C<sub>4</sub> photosynthesis under low light conditions in *Zea mays*, *Miscanthus x giganteus* and *Flaveria bidentis*. *Plant Cell and Environment* 36:365-381

\*Research and funding exclusively from my lab, involved in design, implementation and writing

Gandin A., Duffes C., Day D.A., **Cousins A.B.** (2012) The absence of alternative oxidase AOX1A results in altered response of photosynthetic carbon assimilation to increasing CO<sub>2</sub> in *Arabidopsis thaliana*. *Plant, Cell and Physiology* 59:1627-1637

- \*Research and funding exclusively from my lab, involved in design, implementation and writing
- <sup>^</sup><sup>#</sup>King J.L., Edwards G.E., **Cousins A.B.** (2012) The efficiency of the CO<sub>2</sub>-concentrating mechanism during single-cell C<sub>4</sub> photosynthesis. *Plant Cell and Environment* 35, 513-523  
\*Research and funding exclusively from my lab, involved in design, implementation and writing, plant material from Dr. Edwards
- <sup>^</sup><sup>#</sup>Sun, W, <sup>#</sup>Ubierna, N, Ma, JY, and **Cousins, A.B.** (2012). The influence of light quality on C<sub>4</sub> photosynthesis under steady-state conditions in *Zea mays* and *Miscanthus × giganteus*: changes in rates of photosynthesis but not the efficiency of the CO<sub>2</sub> concentrating mechanism. *Plant, Cell & Environment* 35, 982-993  
\*Research and funding exclusively from my lab, involved in design, implementation and writing
- <sup>^</sup><sup>#</sup>Ubierna N., <sup>#</sup>Sun W., **Cousins A.B.** (2011) The efficiency of C<sub>4</sub> photosynthesis under low light conditions: assumptions and calculations with CO<sub>2</sub> isotope discrimination. *Journal of Experimental Botany* 62, 3119-3134  
\*Research and funding exclusively from my lab, involved in design, implementation and writing
- <sup>^</sup>**Cousins A.B.**, <sup>#</sup>Walker B. Pracharoenwattana I., Smith S.M., Badger M.R. (2011) A non-lethal disruption of photorespiration alters the stoichiometry of Rubisco oxygenation and photorespiratory release of CO<sub>2</sub> *Photosynthesis Research* 108, 91-100  
\*Half the research and funding exclusively from my laboratory from research started as postdoc
- <sup>^</sup>Bloom A.J., Randall R., Rachmilevitch S., **Cousins A.B.**, Carlisle E. (2011) CO<sub>2</sub> enrichment inhibits shoot nitrate assimilation in C<sub>3</sub> but not C<sub>4</sub> plants and slows growth under nitrate in C<sub>3</sub> plants. *Ecology* 93, 355-367  
\*Contribution to writing while at WSU, data collected as postdoc
- <sup>^</sup>Kodama N., **Cousins A.B.**, Tu K.P., Barbour M.M. (2011) Spatial variation in photosynthetic carbon and oxygen isotope discrimination along leaves of the monocot Triticale (*Triticum × Secale*) relates to mesophyll conductance and the Péclet effect. *Plant Cell and Environment* 34, 1548-1562  
\*Contribution to writing and data analysis while at WSU, data collected as postdoc
- <sup>^</sup>Bloom A.J., Asensio J.S.R., Burger M., **Cousins A.B.** (2010) Carbon Dioxide Enrichment Inhibits Nitrate Assimilation in Wheat and Arabidopsis *Science* 328, 899-902  
\*Contribution to writing while at WSU, data collected as postdoc
- <sup>^</sup>Edwards E.J., et al... **Cousins A.B.** one of 25 authors (2010) The Origins of C<sub>4</sub> Grasslands: Integrating Evolutionary and Ecosystem *Science* 328, 587-591  
\*One of many co-authors that contributed to the development and writing
- <sup>^</sup>**Cousins A.B.**, Ghannoum, O., Badger M.R., von Caemmerer S. (2010) Measuring Rubisco kinetics with a membrane inlet mass spectrometer. *Plant Cell and Environment* 33: 444-452  
\*Contribution to writing and data analysis while at WSU, data collected as postdoc
- <sup>^</sup><sup>#</sup>Leisner C.P., **Cousins A.B.**, <sup>#</sup>Offermann S., Okita T.W. & Edwards G.E. (2010) The effects of salinity on photosynthesis and growth of the single-cell C<sub>4</sub> species *Bienertia sinuspersici* (Chenopodiaceae). *Photosynthesis Research* 106, 201-214  
\*Involved in experimental design and writing while at WSU

Before WSU

- Cousins A.B.**, Pracharoenwattana I., Smith S.M., Badger M.R. (2008) The non-essential role of peroxisomal malate dehydrogenase during photorespiration. *Plant Physiology* 148, 786-795
- Cousins A.B.**, Badger M.R., von Caemmerer S. (2008) C<sub>4</sub> photosynthetic isotope exchange in NAD-ME and NADP-ME type grasses. *Journal of Experimental Botany* 59, 1695-1703
- Cousins A.B.**, Baroli I., Badger M.R., Ivakov A., Lea P.J., Leegood R.C., von Caemmerer S. (2007) The role of PEPc during photosynthetic isotope exchange and stomatal conductance. *Plant Physiology* 145, 1006-1017
- Griffiths H., **Cousins A.B.**, Badger M.R., von Caemmerer S. (2007) Discrimination in the dark: resolving the interplay between metabolic and physical constraints to PEPc activity during the CAM cycle. *Plant Physiology* 143, 1055-1067
- Cousins A.B.**, Badger M.R., von Caemmerer S. (2006) A transgenic approach to understanding the influence of carbonic anhydrase on C<sup>18</sup>O<sub>2</sub> discrimination during C<sub>4</sub> photosynthesis. *Plant Physiology* 142, 662-672
- Cousins A.B.**, Badger M.R., von Caemmerer S. (2006) Carbonic anhydrase and its influence on carbon isotope discrimination during C<sub>4</sub> photosynthesis: Insights from antisense RNA in *Flaveria bidentis*. *Plant Physiology* 141, 232-242
- Cousins A.B.** and Bloom A.J. (2004) Oxygen consumption during leaf nitrate assimilation in a C<sub>3</sub> and C<sub>4</sub> plant: the role of mitochondrial respiration. *Plant Cell and Environment*. 27, 1537-1545.
- Rachmilevitch S., **Cousins A.B.** and Bloom A.J. (2004) Nitrate assimilation in plant shoots depends on photorespiration. *Proceedings of the National Academy of Sciences*. 101, 11506- 11510
- Cousins A.B.** (2004). Man bests machine, this time. *The Scientist*. 18: 58.
- Cousins A.B.** and Bloom A.J. (2003) Influence of elevated CO<sub>2</sub> and nitrogen nutrition on photosynthesis and nitrate photoassimilation in maize (*Zea mays* L.). *Plant Cell and Environment* 26, 1525-1530.
- Cousins A.B.**, Adam N.R., Wall G.W., Kimball B.A., Pinter Jr. P.J., Ottman M.J., Webber A.N. (2003) Development of C<sub>4</sub> photosynthesis in Sorghum leaves grown under free-air CO<sub>2</sub> enrichment (FACE) *Journal of Experimental Botany* 54, 1969-1975.
- Cousins A.B.**, Adam N.R., Wall G.W., Kimball B.A., Ottman M.J., Webber A.N. (2002) Photosystem II energy use, non-photochemical quenching and the xanthophyll cycle in *Sorghum bicolor* grown under drought and Free-Air CO<sub>2</sub> Enrichment (FACE) conditions. *Plant Cell and Environment* 25, 1551-1559
- Wall G.W., Brooks T.J., Adam N.R., **Cousins A.B.**, Triggs J., Kimball B.A., Pinter P.J. Jr., LaMorte R.L., Ottman M.J., Leavitt S.W., Matthias A.D., Williams D.G., Webber A.N. (2001) Elevated atmospheric CO<sub>2</sub> improved Sorghum plant water status by ameliorating the adverse effects of drought. *New Phytologist* 152(2), 438-473.
- Conley M.M., Kimball B.A., Brooks T.J., Pinter P.J. Jr., Hunsaker D.J., Wall G.W., Adam N.R., LaMorte R.L., Matthias A.D., Thompson T.L., Leavitt S.W., Ottman M.J., **Cousins A.B.**, Triggs J. (2001) Free-air Carbon Dioxide Enrichment (FACE) effects on sorghum evapotranspiration in well watered and water stressed irrigation treatments. *New Phytologist* 151, 407-412.
- Cousins A.B.**, Adam N. R., Wall G.W., Kimball B.A., Pinter Jr. P.J., Leavitt S.W., LaMorte R.L., Matthias A.D., Ottman M.J., Thompson T.L., Webber A.N. (2001) Reduced photorespiration and increased energy-use efficiency in young CO<sub>2</sub>-enriched sorghum leaves. *New Phytologist* 150, 275-284.

Book chapters

- von Caemmerer S., Evans J.R., **Cousins A.B.**, Badger M.R., Furbank R.T. (2006) C<sub>4</sub> photosynthesis and CO<sub>2</sub> diffusion. *In* Supercharging rice with C<sub>4</sub> photosynthesis.

Non-refereed

**Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2001) Photochemical energy use in Sorghum plants grown under drought and elevated CO<sub>2</sub>. *Proceeding of the 12<sup>th</sup> International Congress on Photosynthesis*.

**Cousins A.B.**, Adam N.R., Webber A.N. (1999) The enhancement of photosynthesis during the 1999 FACE Sorghum experiment. *U. S. Water Conservation Annual Report*.

In review

Giuliani R., Voznesenskaya E., Koteyeva, N., Evans M., **Cousins A.B.** The Structure and Function Relationship of Photosynthesis and Water Use Efficiency in Rice (*Oryza sativa* and *Oryza glaberrima*) and the Wild Relatives within the Genus *Oryza*. *Plant Physiology*

In preparation

Gandin A., Koteeva N., Voznesenskaya E., Edwards G. **Cousins A.B.** Temperature response of the photosynthetic machinery in the C<sub>3</sub>-C<sub>4</sub> intermediate *Salsola divaricate*

Ubierna N., Cambaliza M.O.L., Griffith D., Mount G.H., **Cousins A.B.** Comparison of Fourier Transform Infrared Spectroscopy (FTIR) and Tunable Diode Laser Absorption Spectroscopy (TDLAS) methods for determining stable isotope ratios of atmospheric CO<sub>2</sub>.

Sun W., Ubierna N., Ma J-Y., **Cousins A.B.** The effect of light quality on C<sub>4</sub> photosynthetic efficiency in *Zea mays* and *Miscanthus giganteus*. *Plant Physiology*

**COLLABORATIONS**

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WSU

Sonja Roje, Washington State University

Gerry Edwards, Washington State University

Helmut Kirchhoff, Washington State University

George Mount, Washington State University

Camille Steber, ARS, Washington State University

National

Dave Kramer, Michigan State University

Tom Brutnell, Danforth Center

Chris Myers, Cornell University

Steve Rodermel, Iowa State University

Marty Spalding, Iowa State University

International

Rowan Sage, University of Toronto

Andrew Smith, University of Oxford

Murray Badger, Australian National University

Steve Smith, The University of Western Australia

James Burnell, James Cook University, Australia

Robert Furbank, CSIRO, Australia

Julian Hibberd, Cambridge University, UK

Jane Langdale, Oxford University, UK

Richard Leegood, University of Sheffield

Erik Murchie, University of Nottingham

Susanne von Caemmerer, Australian National University

Peter Westhoff, University of Duesseldorf

Zinguang Zhu, Shanghai Institutes for Biological Sciences

Paul Quick, International Rice Research Institute

**PRESENTATIONS** <sup>+</sup>invited departmental seminars, <sup>\*</sup>Key Note SpeakerOral

- Cousins A.B.** (2012) The efficiency of photosynthetic carbon metabolism. *Key Note Speaker, 38<sup>th</sup> Annual Midwest/Southeast Photosynthesis Meeting, Marshall, Indiana*
- Cousins A.B.** (2012) Measuring leaf photosynthesis. *Cougar Undergraduate Research Experience (CURE) program, Washington State University, Pullman, Washington*
- <sup>+</sup>**Cousins A.B.** (2012) The efficiency of photosynthetic carbon metabolism: Adaptation to changing environmental conditions. *Division of Plant Sciences, University of Missouri-Columbia*
- <sup>+</sup>**Cousins A.B.** (February, 2012) Adaptation of photosynthetic carbon metabolism to changing environmental conditions: Insights Past, Present and Future. *School of Life Sciences, Arizona State University*
- Sage R.F., Busch F.A., **Cousins A.B.**, Sage T.L. (2012) The trapping and re-fixation of photorespiratory CO<sub>2</sub> in C<sub>3</sub> plants: a novel mechanism to compensate for low atmospheric CO<sub>2</sub>. *Photorespiration Meeting, Rostock, Germany*
- Busch F.A., **Cousins A.B.**, Sage T.L., Sage, R.F. (2012) A new method for the measurement of photorespiration *in vivo* and the quantification of re-assimilation of photorespired CO<sub>2</sub> in C<sub>3</sub> plants. *Photorespiration Meeting, Rostock, Germany*
- Gandin A., Ubierna-Lopez N., **Cousins A.B.** (2012) The contribution of respiratory fractionation to leaf CO<sub>2</sub> isotope exchange in the C<sub>3</sub> plant *Nicotiana tabacum*. *20<sup>th</sup> Western Photosynthesis Conference, Asilomar, CA*
- Li P., Giuliani R., Araujo W.L., Si Y., Zhang C., Slewinski T., Liu P., Sun Q., Edwards G.E., Fernie A., Turgeon R., Barkan A., **Cousins A.B.**, T.P. Brutnell (2012). Defining the maize Pyruvate orthophosphate dikinase regulatory network. *International Plant and Animal Genome XX Conference, San Diego, CA*
- Cousins A.B.** (2011) Efficiency of the CO<sub>2</sub> concentrating mechanism during C<sub>4</sub> photosynthesis: Response to change in light availability and potential of the single-cell C<sub>4</sub> plant. *XVIII International Botany Congress, Melbourne, Australia*
- Ubierna N., Cambaliza M.O.L., Griffith D., Mount G.H., **Cousins, A.B.** (2011). Comparison of Fourier Transform Infrared Spectroscopy (FTIR) and Tunable Diode Laser Absorption Spectroscopy (TDLAS) methods for determining stable isotope ratios of atmospheric CO<sub>2</sub>. *American Geophysical Union, Fall Meeting, San Francisco, CA*
- Cousins A.B.** (2011) Limitation of photosynthesis by a slow schizophrenic enzyme: Evolutionary insights into the structure-function relationship of Rubisco. *Palouse Evolution and Ecology Society, Pullman, WA*
- Cousins A.B.** (2011) Efficiency of the CO<sub>2</sub> concentrating mechanism during C<sub>4</sub> photosynthesis: Response to changes in light availability. *DOE contractors meeting, Baltimore MD*
- Cousins A.B.**, Guiliani R., Edwards G.E. (2011) Disruption of C<sub>4</sub> photosynthesis: a gas exchange perspective. *The C<sub>4</sub> Rice Project Meeting International Rice Research Institute, Los Baños, Philippines*
- Cousins A.B.**, Guiliani R., Koteyeva N., Voznesenskaya E., Edwards G.E. (2011) Photosynthesis in wild-relatives of *Oryza sativa*. *The C<sub>4</sub> Rice Project Meeting International Rice Research Institute, Los Baños, Philippines*
- Walker B., **Cousins A.B.** (2011) Increases in photorespiratory CO<sub>2</sub> release under high temperature and oxygen. *19<sup>th</sup> Western Photosynthesis Conference, Asilomar, CA*
- Cousins A.B.** (2010) The CO<sub>2</sub>-Concentrating Mechanism in Single-Cell C<sub>4</sub> Photosynthesis. *C<sub>4</sub> photosynthesis Conference, Shanghai, China*
- Cousins A.B.**, Guiliani R., Koteyeva N., Voznesenskaya E., Edwards G.E. (2009) The CO<sub>2</sub> compensation point in Rice. *The C<sub>4</sub> Rice Project Meeting International Rice Research Institute, Los Baños, Philippines*

- Cousins A.B.** (2009) CO<sub>2</sub> exchange in C<sub>3</sub> and C<sub>4</sub> grasses: Mechanisms and Phylogenetic Insights. *National Evolutionary Synthesis Center: C<sub>4</sub> grass meeting*, Durham North Carolina
- Cousins A.B.**, Walker B., Guiliani R., Edwards G.E. (2009) Variation in the efficiency of photosynthetic carbon metabolism: Response to changing environmental conditions. *Molecular Plant Sciences*, WSU
- Cousins A.B.** (2009) Productive Proposal Writing OGRD Grant Writing Workshop, WSU  
Connecting Mentoring Work to the Next Steps- applying for graduate/professional school, entering workforce *Team Mentoring Workshop*, WSU
- Cousins A.B.** (2009) Mathematical modeling of leaf isotope exchange: mechanisms and phylogenetic insights into global CO<sub>2</sub> exchange. *Research and Training for Undergraduates in Biological and Mathematical Sciences*, WSU
- Cousins A.B.** (2009) Photosynthetic isotope exchange in C<sub>4</sub> plants: mechanisms and phylogenetic insights in global CO<sub>2</sub> exchange. *18<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Pracharoenwattana I., Smith S.M., Badger M.R. (2007) The non-essential role of peroxisomal malate dehydrogenase during photorespiration. *The 14<sup>th</sup> International Congress on Photosynthesis*, Glasgow, Scotland
- Cousins A.B.**, Badger M.R., von Caemmerer S. (2007) C<sub>4</sub> photosynthetic isotope exchange in NAD-ME and NADP-ME type grasses. *C<sub>4</sub> and CAM Meeting*, Cambridge, UK
- Cousins A.B.**, Badger M.R., von Caemmerer S. (2006) Molecular mechanisms of leaf isotope exchange: the role of carbonic anhydrase during C<sub>4</sub> photosynthesis. *American Society of Plant Biologists, Plant Biology*, Boston, MA
- Cousins A.B.** and Bloom A.J. (2004) Influence of elevated CO<sub>2</sub> and nitrogen nutrition on photosynthesis and nitrate photoassimilation in maize (*Zea mays* L.). *12<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2001) Effects of Free-Air CO<sub>2</sub> Enrichment (FACE) and water-stress on photosynthesis in Sorghum leaves. *10<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2000) Development of the C<sub>4</sub> photosynthetic apparatus in sorghum grown in elevated CO<sub>2</sub>. *9<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2000) C<sub>4</sub> photosynthesis in Sorghum leaves under elevated CO<sub>2</sub> and water stress. *USDA, Agricultural Research Service, U.S. WCL*, Phoenix, AZ

Posters \* Undergraduate, + Poster competition winner

- Walker B., \* Ariza, L., Kaines S., Badger, M.R., **Cousins A.B.** (2012) Comparing the *in vivo* parameters for temperature response models of photosynthesis of Tobacco and Arabidopsis *American Society of Plant Biologists, Plant Biology*, Austin, Texas
- Boyd, R., **Cousins, A.B.** (2012) Biochemistry of photosynthetic CO<sub>2</sub> assimilation: a phylogenetic insight into Rubisco kinetics *American Society of Plant Biologists, Plant Biology*, Austin, Texas
- Stutz S., Edwards G., **Cousins, A.B.** (2012) Efficiency of the single-cell CO<sub>2</sub> concentrating mechanism under light limited growth conditions *American Society of Plant Biologists, Plant Biology*, Austin, Texas
- \*Stack, G., Walker, B., **Cousins, A.B.** (2012) Understanding the balance of energy supply and demand during photosynthesis using biophysical approaches *Showcase for undergraduate research and creative activities*, WSU Pullman, Washington
- \* Ariza, L. Walker, B., **Cousins, A.B.** (2012) Modeling and measuring the temperature response of photosynthesis *Showcase for undergraduate research and creative activities*, WSU Pullman, Washington
- Gandin A., \*Duffes C., Barthet M., Smith P., Day D.A., **Cousins A.B.** (2011) The role of the mitochondrial alternative oxidase pathway (AOX) and the nonphosphorylating NAD(P)H

- dehydrogenase in optimizing rates of photosynthetic CO<sub>2</sub> assimilation. *The Gordon Conference on CO<sub>2</sub> fixation*, Les Diablerets, Switzerland
- Ubierna N., Sun W., **Cousins A.B.** (2011). The efficiency of C<sub>4</sub> photosynthesis under low light conditions. *The Gordon Conference on CO<sub>2</sub> fixation*, Les Diablerets, Switzerland.
- Walker B., **Cousins A.B.** (2011) Temperature-dependent increase in photorespired CO<sub>2</sub> impacts modeling of leaf photosynthesis. *American Society of Plant Biologists, Plant Biology*, Minneapolis, MN
- Walker B., **Cousins A.B.** (2011) Increases in photorespiratory CO<sub>2</sub> release under high temperature and oxygen. *The Gordon Conference on CO<sub>2</sub> fixation*, Les Diablerets, Switzerland
- Giuliani R., Voznesenskaya E., Koteyeva N., **Cousins A.B.**, Edwards G.E. (2011). Structural and functional characterization of photosynthesis in *Oryza* lines. *XVIII International Botany Congress*, Melbourne, Australia
- Ritter J., **Cousins A.B.** (2011) Leaf CO<sub>2</sub> and H<sub>2</sub>O isotope exchange in C<sub>4</sub> plants *American Society of Plant Biologists, Plant Biology*, Minneapolis, MN
- Boyd R., **Cousins A.B.** (2011) Identifying a structure-function relationship in Rubisco. *ARCS Fellows Convocation and Luncheon*, Sheraton, Seattle, Washington
- Boyd R., **Cousins A.B.** (2011) Identifying a structure-function relationship in Rubisco. *ARCS Site Visit*, Compton Union Building, Pullman, Washington
- \*Bollinger-Smith C., Boyd R., Walker B., **Cousins A.B.** (2011) Modeling Photosynthetic Temperature Response in *Arabidopsis*. *College of Sciences Undergraduate Research Poster Competition*, WSU Pullman, Washington,
- Boyd R., \*Bollinger-Smith C., **Cousins A.B.** (2011) Complete Rubisco kinetic parameters in *Arabidopsis thaliana* determined with a membrane inlet mass spectrometer assay technique. *WSU Plant Sciences Retreat*, Ensminger Pavilion, Pullman, Washington
- Stutz S., Edwards G.E., **Cousins A.B.** (2011) Efficiency of the CO<sub>2</sub> concentrating mechanism in the single-cell C<sub>4</sub> plant *Bienertia sinuspersici* under light limited growth conditions. *American Society of Plant Biologists, Plant Biology*, Minneapolis, MN
- Sun W., Ubierna N., Ma J-Y., **Cousins A. B.** (2010) Impacts of light quality on the photosynthesis of *Zea mays* and *Miscanthus × giganteus*. *C<sub>4</sub> photosynthesis Conference*, Shanghai, China
- Sun W., Ubierna N., Ma J-Y., **Cousins A. B.** (2010) Impacts of light quality on the photosynthesis of *Zea mays* and *Miscanthus × giganteus*. *15th International Congress of Photosynthesis*, Beijing, China
- Sun W., Ma J-Y, Ubierna N., **Cousins A. B.** (2010). Impacts of light quality on the photosynthesis of two C<sub>4</sub> crops, *Zea mays* and *Sorghum bicolor* and a C<sub>4</sub> grass *Miscanthus × giganteus*. *Western ASPB Meeting*, Pullman, Washington
- Walker, B.J, Edwards, G.E., **Cousins A.B.** (2010) Increases in photorespiratory carbon dioxide release. *15th International Congress of Photosynthesis*, Beijing, China
- King J., Edwards G.E., **Cousins A.B.** (2010) Efficiency of the CO<sub>2</sub> Concentrating Mechanism in Single-Cell C<sub>4</sub> Metabolism *C<sub>4</sub> photosynthesis Conference*, Shanghai, China
- King J., Edwards G.E., **Cousins A.B.** (2010) Efficiency of the CO<sub>2</sub> Concentrating Mechanism in Single-Cell C<sub>4</sub> Metabolism *Western ASPB Meeting*, Pullman, Washington
- Giuliani, R., Voznesenskaya, E., Koteyeva, N., **Cousins, A.B.**, Edwards, G.E. (2010) Structural and Functional Characterization of Photosynthesis in Rice and wild relatives (genus *Oryza*) *C<sub>4</sub> photosynthesis Conference*, Shanghai, China
- Giuliani, R., Voznesenskaya, E., Koteyeva, N., **Cousins, A.B.**, Edwards, G.E. (2010) Structural and Functional Characterization of Photosynthesis in Rice and wild relatives (genus *Oryza*) *15th International Congress of Photosynthesis*, Beijing, China
- Giuliani, R., Voznesenskaya, E., Koteyeva, N., **Cousins, A.B.**, Edwards, G.E. (2010) Structural and Functional Characterization of Photosynthesis in Rice and wild relatives (genus *Oryza*) *Western ASPB Meeting*, Pullman, Washington
- Florian, B., Sage, T.L., **Cousins, A.B.**, Sage, R.F. (2010) Refixation of photorespiratory CO<sub>2</sub> as a method to minimize carbon loss in C<sub>3</sub> grasses *15th International Congress of Photosynthesis*, Beijing, China



- Florian, B., Sage, T.L., **Cousins, A.B.**, Sage, R.F. (2010) Refixation of photorespiratory CO<sub>2</sub> as a method to minimize carbon loss in C<sub>3</sub> grasses *Canadian Society of Plant Physiologists*, Toronto, Canada
- \*+ Cha, P., **Cousins, A.B.** (2010) Modeling Oxygen Isotope Exchange Between Atmospheric CO<sub>2</sub> and Leaf H<sub>2</sub>O in C<sub>4</sub> Plants *Western ASPB Meeting*, Pullman, Washington
- \*+ Cha, P., **Cousins, A.B.** (2010) Modeling Oxygen Isotope Exchange Between Atmospheric CO<sub>2</sub> and Leaf H<sub>2</sub>O in C<sub>4</sub> Plants *WCOS Undergraduate Research Poster Competitions*, Pullman, Washington
- Ritter, J., **Cousins, A.B.** (2010) Deviation of H<sub>2</sub>O Oxygen Isotope Composition between the Leaf Site of Water Evaporation and Source Water *Western ASPB Meeting*, Pullman, Washington
- Sun K., Huang T., **Cousins A.B.**, Maliga P. & Roje S (2010) An unusual photorespiratory-like phenotype in plants expressing 5,10-methylenetetrahydrofolate reductase in plastids *Western ASPB Meeting*, Pullman, Washington
- Sun K., Huang T., **Cousins A.B.**, Maliga P. & Roje S (2009) An unusual photorespiratory-like phenotype in plants expressing 5,10-methylenetetrahydrofolate reductase in plastids *Plant Metabolic Engineering Gordon Conference*
- Walker B. & **Cousins A.B.** (2009) Photorespiration and plant carbon use: More of the story to tell *WSU Academic Showcase*
- King J., Edwards G.E., **Cousins A.B.** (2009) Efficiency of the CO<sub>2</sub> Concentrating Mechanism in Single-Cell C<sub>4</sub> Metabolism *American Society of Plant Biology*, Honolulu Hawaii
- Courtney L. *et al.* (2009) Salinity tolerance in the single-cell C<sub>4</sub> species *Bienertia sinuspersici*. *American Society of Plant Biology*, Honolulu Hawaii
- Courtney L. *et al.* (2009) Salinity tolerance in the single-cell C<sub>4</sub> species *Bienertia sinuspersici*. *Molecular Plant Sciences Symposium*, Washington State University.
- Courtney L. *et al.* (2009) Salinity tolerance in the single-cell C<sub>4</sub> species *Bienertia sinuspersici*. *18<sup>th</sup> Western Photosynthesis Conference*, Asilomar CA
- Cousins A.B.**, Walker, B.J, Pracharoenwattana I., Smith S.M., Badger M.R. (2009) Non-lethal disruption of photorespiration alters the stoichiometry of Rubisco oxygenation and photorespiratory release of CO<sub>2</sub>. *18<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Ghannoum O., von Caemmerer S, Badger M. (2008) Complete Rubisco kinetic parameters in C<sub>3</sub> (*Triticum aestivum*) and C<sub>4</sub> (*Zea mays*) grasses determined with a membrane inlet mass spectrometer assay technique. *The Gordon Conference on CO<sub>2</sub> fixation*, Biddeford, USA
- Griffiths H., **Cousins A.B.**, Badger M.R., and von Caemmerer S (2007) Discrimination in the dark: resolving the interplay between metabolic and physical constraints to PEPC activity during the CAM cycle. *C<sub>4</sub> and CAM Meeting*, Cambridge, UK
- Baroli I., **Cousins A.B.**, \*Ivakov A., Lea P.J., Leegood R.C., von Caemmerer S. (2007) The influence of phosphoenolpyruvate carboxylase activity on stomatal conductance in C<sub>4</sub> plants. *C<sub>4</sub> and CAM Meeting*, Cambridge, UK
- Baroli I., **Cousins A.B.**, \*Ivakov A., Lea P.J., Leegood R.C., von Caemmerer S. (2006) The influence of phosphoenolpyruvate carboxylase activity on stomatal conductance in C<sub>4</sub> plants. *ASPB, The Biology of Transpiration*, Snowbird, UT
- Baroli I., **Cousins A.B.**, \*Ivakov A., Lea P.J., Leegood R.C., von Caemmerer S. (2006) The influence of phosphoenolpyruvate carboxylase activity on stomatal conductance in C<sub>4</sub> plants *International Society of Plant Molecular Biology*, Adelaide, Australia
- Cousins A.B.**, Badger M., von Caemmerer S. (2006) Mechanisms of leaf isotope exchange: the role of carbonic anhydrase during C<sub>4</sub> photosynthesis. *American Society of Plant Biologists, Plant Biology*, Boston, MA
- Burger M., **Cousins A.B.**, Bloom A.J. (2006) Nitrate Assimilation in Elevated CO<sub>2</sub> or Low O<sub>2</sub> Atmospheres *15<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Badger M., von Caemmerer S. (2005) C<sup>18</sup>O<sup>16</sup>O and <sup>13</sup>CO<sub>2</sub> discrimination during C<sub>4</sub> photosynthesis: The role of carbonic anhydrase. *The Gordon Conference on CO<sub>2</sub> fixation*, Aussois, France

- Cousins A.B.** and Bloom A.J. (2004) Oxygen consumption during leaf nitrate assimilation in a C<sub>3</sub> and C<sub>4</sub> plant: the role of mitochondrial respiration in the light. *The 13<sup>th</sup> International Congress on Photosynthesis*, Montreal, Canada
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2001) Photochemical energy use in Sorghum plants grown under drought and elevated CO<sub>2</sub>. *The 12<sup>th</sup> International Congress on Photosynthesis*, Brisbane, Australia
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (2000) Elevated CO<sub>2</sub> effects on photosynthesis in the C<sub>4</sub> crop, Sorghum. *American Society of Plant Biologists, Plant Biology*, San Diego, CA
- Cousins A.B.**, Adam N.A., Wall G.W., Kimball B.A., Webber A.N. (1999) The effects of water stress and elevated CO<sub>2</sub> on C<sub>4</sub> photosynthesis of *Sorghum bicolor*. *8<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA
- Cousins A.B.**, Webber A.N. (1998) Examining C<sub>4</sub> photosynthesis in *Sorghum*. *7<sup>th</sup> Western Photosynthesis Conference*, Asilomar, CA

## TEACHING

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### At WSU

- Lecturer, Biology 513 Plant Metabolism  
Washington State University, Fall 2012
- Co-Lecturer, Biology 106 Introduction to Biology,  
Washington State University, Spring 2008, 2009, 2010, 2011 and 2012
- Guest lecturer, Biology 540 Stable Isotope Theory and Methods,  
Washington State University, Spring 2012
- Guest lecturer and lab, CE 543 Nitrogen measurements  
Washington State University, Spring 2012
- Lecturer, Biology 504 Methods in Plant Physiology  
Washington State University, Fall 2009 and 2011
- Co-Lecturer, Crops 405 Plant Biotechnology  
Washington State University, Spring 2010

### As Postdoc or graduate student

- Co-Lecturer, Functional Ecology,  
Australian National University, 2006
- Guest lecturer, Plant Ecophysiology,  
UC Davis, Winter 2004
- Teaching and course development workshops,  
UC Davis, Spring 2003
- Substitute lecturer, Plant Biology,  
UC Davis, Fall 2002
- Teaching Assistant, Computers applications in biology,  
Arizona State University, F 2001
- Co-Lecturer, Cell and Molecular Biology,  
Arizona State University, Spring 2001
- Substitute lecturer, Cell Biology,  
Arizona State University, Fall 2000
- Substitute lecturer, Plant Anatomy,  
Arizona State University, Fall 1999
- Teaching Assistant, Plant Anatomy laboratory,  
Arizona State University, Fall 1999
- Teaching Assistant, Plant Physiology laboratory,  
Arizona State University, Spring 1999

**ADVISEES**

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## Undergraduate coursework advisees active during Spring 2012

Joseph Choi  
Sean Hauck  
Kellon Hunt  
Kelly Sutherland  
Brittany Comstock  
Corson Cunningham  
Alex Gallacher  
Sarah Pike  
Chenghung Shih  
Chris Smolkowski  
Kevin Tran

## Undergraduate Research Projects

Paul Cha (08-10)  
Courtney Cacabelos (2009)  
Connor Bollinger-Smith (09-2011)  
Patrick Kramer (09-2011)  
Clarie Duffee (10-2011)  
Loren Ariza (11-2012)  
Gordon Stack (11-current)  
Tom Sexton (12-current)  
Mykhaylo Denysyuk (12-current)  
Kevin Tran (12-current)  
Lwanga Nsubuga (12-current)  
Jenna Degreef (12-current) co-supervised with Dr. Gittes, Department of Physics, WSU

## Graduate Students

Jenny King, MS (08-2010)  
Berkley Walker, PhD (08-current)  
Jeff Ritter, PhD (09-current)  
Samantha Stuz, MS (10-current)  
Ryan Byod, PhD (10-current)  
Conor Bollinger-Smith, MS (11-current)  
Erika Serrano, PhD Fulbright Fellow (12-current)

## Postdoctoral Scientist

Anthony Gandin: (10-current)  
Rita Guilianni (09-current) co-supervised with Dr. Gerry Edwards, School of Biology, WSU  
Nerea Lopez (09-2011)  
Wei Sun (09-2011)

## Visiting Scientist

Maxim Karpalov (5/12-7/12)  
Jian-Ying Ma (10-2011)  
Florian Busch (1/10-4/10)  
Murray Badger (4/10-7/10)  
Rowan Sage (1/10)

## Graduate student committee service

Travis Almquist, PhD (2009-current)  
Kirt Onthank, PhD (2009-current)  
Dan Mullendor, PhD (2009-current)  
Brenton Poirier, PhD (2011-current)

Sierra Beecher, PhD (2011-current)  
 Kristen Woffinden, PhD (2012-current)  
 Sarah Anderson, PhD (2011-current)  
 James Santiago, PhD (2012-current)  
 Dipika Jadav, PhD (2012-current)  
 Courtney Leisner, MS (2008-2010)  
 Byran Carlson, MS (2008-2010)  
 Josh Rosnow, MS (2008-2010)

## AWARDS

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SOLS Outstanding Young Alumni Award, ASU	2011
College of Sciences Early Career Faculty Award, WSU	2011
Nominated for College of Sciences Faculty Advising Excellence	2009
Grantwriters' Mentored Proposal Writing Workshop: Tuition waver	2009
Gordon Conference Financial Award	2008
American Society of Plant Biologists Travel Grant	2006
Gordon Conference Financial Award	2005
National Science Foundation International Postdoctoral Fellowship	2004-2007
American Society of Plant Biologists Travel Grant	2000
National Science Foundation Graduate Research Training Fellowship	1997-01
Arizona State University Graduate Academic Scholarship	1997-01
Arizona State University Graduate Assistant Tuition Scholarship	1997-01

## PROFESSIONAL AFFILIATIONS

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National Postdoctoral Association (NPA)	2001-2003
Council on Undergraduate Research (CUR)	2000-2004
American Society of Plant Biologists (ASPB)	1998-current
Plant Biology Graduate Student Association (PBGSA)	1997-02
International Society of Photosynthesis Research (ISPR)	2001-current
Molecular Plant Sciences Graduate Program	2008-current

## PROFESSIONAL SERVICE

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### *Washington State University*

Showcase for undergraduate research and creative activities, WSU (2012)  
 Poster judge  
 Cougar Undergraduate Research Experience (CURE) (2012)  
 Presenter and interviewer  
 Crops and Soil faculty search committee, WSU, 2012-present  
 Fluorescence phenotyping facility steering committee, 2011-present  
 Mass spectrometer steering committee, 2008-present  
 Office of Multicultural Student Services Team Mentoring Program, 2009-present  
 Student mentor  
 Honors College new student orientation (2011)  
 Discussion common reading selection with students  
 Honors College Thesis evaluator (2011)  
 For Heather Enlow  
 Grant writers' Mentored Proposal Writing Workshop 2009  
 Presentation on grant writing  
 Faculty Committee to assist WSU evaluation by Art & Science Group 2009  
 Group to discuss WSU culture for Provost Office

Co-Organizer Molecular Plant Physiology Graduate Recruitment weekend, 2011  
 Co-Organizer Western American Society of Plant Biologist meeting Pullman, WA, 2010

*College of Science*

Research and Training for Undergraduates in Biological & Mathematical Sciences, 2008-2011  
 Student research mentor (two students: Paul Cha & Conor Bolinger-Smith)  
 College of Sciences Undergraduate Research Competition 2008,2009, 2010 & 2011  
 Poster Judge

*School of Biological Sciences*

SBS seminar organizer, Spring 2012  
 SBS Graduate Student Association Committee, 2011-present  
 Hiring Committee for SBS Finance Officer, 2011  
 SBS undergraduate recruitment at “Preview Days”, 2010  
 Vincent Franceschi Research Fellowships in Plant Biology Committee, 2008-present

*Outside the University*

Associate Editor, Journal of Photosynthesis Research, 2011-present  
 Australian CSIRO Researching With Scientists Program, 2004-06  
 Guest lectured at local high schools to encourage student participation in science and facilitated teacher training workshops.  
 Postdoctoral teaching initiative committee, Postdoc Scholars Association, UCD, 2004.  
 Organized teaching workshops and lecturing opportunities for Post Docs.

*Ad hoc* journal reviewer:

Global Change Biology  
 Journal of Experimental Botany  
 Photochemistry and Photobiology  
 Photosynthesis Research  
 Plant Physiology  
 Plant Cell and Environment

*Ad hoc* grant reviewer:

National Science Foundation  
 USDA

**VOLUNTEER AND OUTREACH**

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Community Lead Learning with Palouse Prairie School, Moscow Idaho 2012-current  
 Science Alliance program with Moscow High School 2010-current  
 Graduate students teaching in high school sciences courses  
 Lena Whitmore Elementary School, Moscow Idaho 2009  
 Class demonstration on DNA extraction and PCR  
 Moscow High School, Moscow Idaho 2009-current  
 Mentor for Extended Learning Program (to date three high school students)  
 The O’Conner Cooperative and Inner north parks, 8/05-07  
*Native plant re-vegetation and development of an environment centre*  
 Friends of Putah Creek, 9/03  
*Cleanup and restoration*  
 Ramsey Canyon Preserve, Arizona. 18/00  
*Riparian restoration*  
 Bilsa Biological Reserve, Ecuador, 03/97 – 05/97  
*Tropical flora sampling and permanent plot construction*  
 National Herbarium of Ecuador, Quito Ecuador, 01/97–05/97