Nomination for Regents' Professor: Ragan (Ray) M. Callaway

It is a real pleasure to nominate Professor Ray Callaway for the distinguished honor of Regents' Professor. Such a distinction is properly reserved for a very small number of faculty members who have demonstrated outstanding scholarship of truly international caliber, a true commitment to teaching/mentoring, and service at many levels both within and outside the University. I shall address each of these issues in turn.

Scholarship. As the letters of support (both external and internal) readily point out, Professor Callaway's publications are remarkably numerous and have outstanding impact. Ray's rate of publication is truly astonishing – in many recent years, he has published at least one journal article per month, some 3-6 times the rate of a reasonably productive scientist. These are not typically short notes, commentaries, or editorials, but substantive papers usually based on some extensive data set or elegant experiment. These papers are well-appreciated by the ecological science community, having been cited over 12,000 times (this is a conservative estimate) altogether, including over 5500 citations in just the past 4 years! These are not common numbers; as Steve Running points out in his letter, Ray is one of only 4 faculty members at UM to have earned the title of Highly Cited Scientists by Thomson Reuters (the company that runs the Science Citation Index). Of the remaining three, two are already Regents' Professors, and the third is not eligible to be (Tom Martin is not an employee of the MUS). It is worth noting that the vast majority of Ray's citations have come from papers published while he was at UM, and thus bring recognition to the Montana University System. In recognition of his high output and impact, the DBS FEC has judged Ray to be 'outstanding' in research accomplishments for 17 of the past 20 FEC reviews.

Numbers are only a part of the story. Professor Callaway has become recognized world-wide for extensive contributions in two major areas of ecology. The first of these, the importance of positive (facilitative) interactions between plants within a community, has become almost a hallmark of Ray's – he was championing this idea when it was still almost universally ignored or even dismissed as implausible or trivial. Over the years, his convincing blend of experimental data and conceptual synthesis has turned the tides, culminating with his authoritative book (2007). It is now common, almost expected, that every serious work on plant community processes must discuss the effects of positive interactions. His second major emphasis, on invasive species, has been characterized by an unusual (for ecologists) focus on detailed mechanisms by which a successful invader outcompetes natives in its new range. These mechanisms have proven to be quite diverse, ranging from chemical warfare (allelopathy) to positive interactions with particular fungi. More important, Ray was one of the pioneers in testing the relevance of these mechanisms both in the original (native) range of the invading species as well as in its new (introduced) range. Ray's multidisciplinary approach and important contributions to the study of allelopathy were recognized by his being accorded the Grodzinski Award during 2005. Along the way, Ray has forged many collaborations and close ties with researchers from Europe (the source of many of our invasive species), some of which have contributed directly to formal ties between UM and foreign universities (e.g., University of Pecs, Hungary). Ray's extraordinary intellectual contributions to UM were the basis of his being nominated for and receiving the President's

Distinguished Scholar Award in 2005. More recently, he has been recognized by national bodies for his academic accomplishments. In 2010, he was elected a fellow of the American Association for the Advancement of Science, and in 2012, he was nominated for a MacArthur 'genius' award.

Teaching. Professor Callaway epitomizes the notion of teaching across the entire range of college students. Professor Callaway has taught, and continues to teach, at every level from non-majors undergraduates (e.g., BIOB 170 'Diversity of Life'; BIOE 172 'Introduction to Ecology') to advanced graduate courses, including his signature Advanced Plant Ecology (BIOL 517). His upper-division biology courses include courses in his area of expertise (BIOE 449 Plant Biogeography), service courses for the Wildlife major (BIOO 335 Rocky Mountain Flora), and a summer field course at Flathead Lake Biological Station (BIOL 459 Alpine Ecology). His formal teaching load has been average to above average for the biological sciences at UM since his start here, so his world-renowned expertise is readily available to all students who seek it. Less obvious is his incredible dedication to advanced students. Although not counted as part of his usual teaching load, Ray frequently offers both an advanced undergraduate and a distinct graduate seminar in plant ecology or biogeography. These small-group discussions are unique opportunities for students to become immersed in the most advanced literature in plant ecology.

Ray has not only taught a lot and at all levels, but done so to very positive reviews from UM students. Of the 17 years in which he was evaluated by the SEC, Ray received 'Excellent' or 'Excellent/Very Good' ratings in 13 years, with the remaining 4 ratings of Very Good. On two occasions the SEC remarked that he had received among the highest scores from students of any DBS faculty member that year. Professor Callaway's excellent teaching evaluations have been an important part of his receiving regular 'merit' awards through the FEC: 11 times in the 17 years that he has been eligible since arriving at UM.

In addition to classroom teaching, Ray has been a generous mentor to undergraduates seeking research experiences in biology. A high fraction of the undergraduates who work with Ray are inspired to continue for graduate work in ecology, and are frequently competitive for the best graduate programs because of their research experiences in his lab. A typical case involves a recent biology graduate who walked into Ray's office offering to do some menial tasks – repotting plants, cleaning – and started to talk to Ray about his research. After an hour, Ray gave him a journal article to read and encouraged the student to return the next week to discuss it. Within a few months, the student was developing an original research project, for which he gathered data the following summer and then successfully wrote and submitted a paper to a professional journal. It is a rare semester that Ray does not have at least one undergraduate taking reading or research credits with him, and his impact is considerably greater because of the many students who work for him and gain field experience on his funded research projects. He also gives generously of his time to be the academic advisor to 15-19 Wildlife Biology majors every year. Ray's superb success in mentoring culminated this fall with his receipt of the Davidson Honors College Paul Lauren Undergraduate Mentor Award, an honor that is student-driven.

Ray's prowess as a graduate mentor is well recognized and appreciated within the OBE graduate program. His students regularly shine at national ecology meetings, win awards and fellowships for their work, and succeed in landing coveted postdoctoral positions and faculty positions, even in this extremely competitive market. Their success is based in part on his unrelenting insistence on quality

work – the papers and presentations of his students are remarkable for the way that they study every angle of a problem and ensure that all reasonable critiques are anticipated and dealt with. Yet Ray also coaxes the most creative efforts from his students, encouraging them to 'think outside the box', question dogma, and make up their own minds about current controversies rather than following the crowd. Ray is also generous with authorship – in many cases, students working on an idea that was initially suggested by Ray end up being senior coauthors on the resulting papers. This combination of supportive stewardship and high expectations is a winning combination, as evidenced by the success of his current and former students. A large majority (10/13) of his completed students (3 MS, 10 PhD) have successfully pursued productive academic or research careers. Ray manages to direct each student to success despite having a high advising load. For nearly all of his 18 years at UM, Ray has been the major advisor for an average of 5 graduate students at a time, a value appreciably higher than most science faculty members.

Because of Ray's great track record with his own advisees, he is extremely sought after as a committee member. He has served on the committees of an average of 13 UM graduate students annually for the past decade, about 8 of which have been in OBE and 5 in Wildlife or Forestry, with occasional service in other programs (Philosophy, Geography). With these numbers, it is easy to appreciate Ray's impact on graduate education at UM!

Ray's contributions as a graduate advisor extend far beyond UM. He is regularly requested to be on committees of foreign students or the external examiner on foreign dissertation defenses (which, unlike most U.S. university dissertation defenses, can be quite adversarial and may end in failing the candidate). He has served on committee of students from New Zealand (Univ of Otago), India (Univ. of New Delhi), and France (Joseph Grenoble University), and he has been the external examiner on dissertations from Canada, Switzerland, Austria, Israel, France, and Australia, in several cases for two or more students and universities.

Service. Professor Callaway is notably active in service, at all levels from his department to world-wide professional organizations. His colleagues have recognized his commitment to service by according him an 'outstanding' rating for service in 7 of the 18 years in which he was evaluated. This is a very high value relative to most faculty members. This service comprises notable efforts at many levels. Within the Division and the OBE graduate program, Ray is a selfless volunteer, willing to take on any necessary task that will benefit the group. Mostly notably, he was the graduate program director for a 3-year term, has participated in all job searches relevant to his expertise, and has Chaired nearly every major committee that exists in his graduate program. Recently, he has spearheaded the development of an attractive informational brochure for the graduate program, to be used for outreach to the public, legislators, potential students, and donors. Ray is also an active participant and advocate in the Wildlife Biology program, shouldering a substantial undergraduate advising load, co-teaching a required course for Wildlife majors, and contributing to time-consuming search committees.

At the broader University level, Ray has been consistently involved at many levels. First, he has been a willing and engaged member of graduate advising committees outside his home programs (OBE, Wildlife), notably for Forestry students (averaging 2-3 per year) but including programs as diverse as

Geography and Philosophy. Second, he has served on several non-departmental faculty and administrative searches, including a recent search in Forestry and the current search for new Vice-President for Research. Third, he has been active in encouraging and coordinating bilateral relationships between UM and foreign Universities. These efforts include traveling to Taiwan to discuss formal ties between UM and the University of Providence and Tunghai University in 2004, and more recently hosting academic guests and visiting faculty from the University of Pecs in Hungary. At a less formal level, but equally important to build long-term ties with non-U.S. institutions, is Ray's hosting of foreign visiting professors. In this respect, Ray is phenomenal: in just the last 6 years, Ray has hosted 28 different scholars from foreign universities in 18 countries on five continents (China, Austria, Denmark, Spain, Czech Republic, Brazil, Puerto Rico, New Zealand, India, Hungary, Chile, Mexico, Scotland, France, Canada, Switzerland, Germany, and Romania). These international ties not only increase UM's reputation globally, but provide well-defined and supportive opportunities for UM students to study abroad. Fourth, Ray has donated significant effort on several university-level committees that require reviews of several to dozens of applications, including the Center for Excellence in Learning and Teaching (Excellence in Teaching award), undergraduate applicant scholarship review, and MILES student fellowships. Fifth, he has served on a diversity of campus-wide committees, including the Mt. Sentinel weed control committee, the Athletics committee, many years on Grad Council, the Provost's advisory committee and the 2012 search committee for a new Vice-President for Research and Creative Scholarship. Finally, Ray has donated his time and effort in diverse but singular events, such as giving a Provost's Lecture.

At the level of the Montana University System, Ray has recently provided outstanding leadership as the new Director of the Montana EPSCoR grant. In this capacity, he has boosted morale, encourage dialogues across the MUS campuses, shifted priorities, and was instrumental in convincing the National Science Foundation to continue funding the current award.

Professional: Ray's involvement in professional service is truly outstanding. As Ray's academic repute has grown and spread, his contributions and commitments to journals, societies, granting agencies, and other universities have increased to very high levels. For journals, he reviews literally dozens of manuscripts every year; during the past decade up to 2013, he has handled no fewer than 19 and up to 45 manuscripts per year for 11 to 25 distinct professional journals. Furthermore, he has been an Editor or Associate Editor for a major journal in ecology since at least the mid-1990's, and more recently has served this role for two journals at a time, including the very high-profile Trends in Ecology and Evolution. For the British Ecological Society, Ray recently (2009) organized a special meeting devoted to the role of positive interactions among plants in affecting the structure of ecological communities. He regularly reviews an average of 10 grant proposals per year for several funding agencies, both national (NSF, EPSCoR-MONTS, Fulbright, USDA, Jeffress Memorial Foundation, Kearney Foundation, The Nature Conservancy) and international (German NSF, The Royal Society of New Zealand, National Environment Research Council-UK,), Israel-US Bi-National Program, Swiss National Science Foundation). These reviews are time-intensive and require considerable care, as they determine both the major directions of research effort in a field and the careers of individual scientists. In additional to reviews of individual proposals, Ray has served as a member of agency review panels (e.g., NSF panels on Postdoctoral

Fellowships in Biology, Ecology) and as an invited external on-site reviewer for major international research efforts funded by governmental agencies ('Jena Project' for German NSF, International award for joint USA-Mongolia ecological research for NSF, GLORIA international climate/vegetation monitoring program for the University of Vienna's EU proposal). Finally, Ray regularly grants requests for evaluations of tenure and promotion files. In the past seven years, he has provided 22 such evaluations and 33 in his career.

Public: Ray has provided consistent public outreach and service at two levels. First, within the University, he has been a faculty advisor to the ASUM Intervarsity Fellowship for the past 18 years, and three other ASUM clubs (Foreign Students Intervarsity, International Students Christian Fellowship, Flora and Fauna Club) for shorter periods of 1-5 years. He has judged for the MT State Science Fair at UM and reviewed the Montana Junior Academy of Sciences. Second, he has provided outreach on invasive species and plant community ecology to the public, through such diverse activities as an extension course (Range Ecology), a community forum on weed control (Helmsville, MT), and inviting a film crew ('The Nature of Things') to film some of his ecological studies.

Summary: Professor Ray Callaway is without question a phenomenally productive scientist of international stature and renown. His work is extremely highly cited (over 12,000 times) and recognized for his original and distinctive contributions in plant community ecology, including recent national distinctions. His collaborations are truly global, with 28 visiting scientists from 18 foreign countries across 5 continents having arranged to come to UM to share Ray's lab since 2005. The external letters of support demonstrate the high regard in which he is held by leaders in this field. Ray's contributions to teaching at UM are outstanding from non-major's courses to the most advanced graduate offerings, and he is often recognized by our annual Student Evaluation Committee as among the most highly-evaluated professor among the 35 tenure-track faculty in DBS. His combination of encouragement and rigor as a student mentor has led to a very high rate of finished graduate students and successful post-graduation careers. Many of his undergraduate research students publish papers on their research and go on to advanced degrees. Ray's contributions in service to UM and his profession are diverse and generous, including frequent outreach to Montana communities.

I present Professor Callaway's file to you with great enthusiasm.

Sincerely,

Charles H. Janson

Charles Janson
Associate Dean, Division of Biological Sciences

Ray Callaway: summary of graduate advising

Year	Advisor	OBE committee	Wildlife or Forestry committee	other UM committee	non-UM committee	**Total graduate committees**
1993-7	7	9	21	1		**38**
1997-2003	9	21	14		1	**45**
2003-4	4	12	8		1	**25**
2004-5	4	9	4			**17**
2005-6	7	9	2			**18**
2006-7	6	9	4		1	**20**
2007-9	4	7	3	1	1	**16**
2009-10	4	7	3	1	2	**17**
2010-11	5	6	7	2	2	**22**
2011-12	5	6	6	2	2	**21**
2012-13	5	7	7	2	5	**26**

Ray Callaway: Summary of service

Period	**MUS, University and Departmental service**
1993-7	Grad council, Mt Sentinel weed control committee, UM scholarship review (25 students); 2 DBS faculty searchers, 7 dept or program committees
1997-2003	Grad Council, Athletics committee; FEC, Seminar committee, entrance exam committee, grad student committee
2003-4	traveled to Taiwan to establish bilateral Univ relationships with Providence and Tunghai universities; OBE program director, FEC;
2004-5	OBE program director, FEC
2005-6	OBE program director, FEC, Grad Eval committee
2006-7	CELT committee (reviewed 25 nominations for Excellence in Teaching Award); organized UM symposium on plant-plant interactions; OBE seminar committee
2007-9	CELT committee; 1 faculty search in Forestry; 1 DBS faculty search, OBE Grad admissions committee
2009-10	reviewed proposals for MILES fellowships at UM; DBS FEC
2010-11	graduate committee of doctoral student in Philosophy; OBE graduate evaluations Chair
2011-12	VPR search committee, Provost's lecture (Dec); OBE seminar Chair,fund-raising pamphlet for OBE, acting graduate Program Director for OBE
2012-13	state-wide NSF EPSCoR Director; VPR search committee; OBE seminar Chair

Period	**Professional service**
1993-7	1 yr editorial board Ecology; 8-9 mss/year, across a total of 23 journals
1997-2003	board of editors (BoE) for Eecology and J. Ecology; 2 NSF panels, external examiner on 6 foreign PhD dissertation defenses; many mss for 12 journals, multiple grant proposals for 4 agencies
2003-4	BoE of J. Ecology; external examiner for 1 foreign PhD dissertation; many mss for 11 journals, multiple grant proposals for 3 agencies
2004-5	BoE of J. Ecology, guest editor Biological Invasions; 2 letters of eval for promotions; NSF panel; 44 mss for 25 journals, 16 proposals for 4 agencies
2005-6	BoE of J. Ecology and TREE; 2 letters of eval for promotions; 31 mss for 19 journals, 8 proposals for 3 agencies
2006-7	BoE of J. Ecology and TREE; external review for University of Vienna program in alpine ecology; outside reviewer for Campbell textbook section on community ecology; 19 mss for 16 journals, 4 proposals for 3 agencies
2007-9	Associate Ed for J. Ecology and TREE; 9 letters for promotion or tenure; external examiner for dissertations in 3 foreign countries; 45 mss for 16 journals, 1 proposals for 1 agency (German NSF)
2009-10	Associate Ed for J. Ecology and TREE; 4 letters for promotion or tenure; external reviewer for U Penn PIRE award; 23 mss for 20 journals, 16 proposals for 3 agencies; special on-site evaluation of NSF funded international project
2010-11	Associate Ed for J. Ecology and TREE; 5 letters for promotion or tenure; 24 mss for 19 journals, 2 proposals for NSF + 8 proposals for Fulbright
2011-12	Associate Ed for J. Ecology and TREE; external review for Academy of Finland about national ecology program; 4 letters for promotion or tenure; 13 mss for 16 journals, 4 proposals for NSF
2012-13	Associate Ed for J. Ecology and TREE; 4 letters for promotion or tenure; 8 mss for 7 journals

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Citation Report Author=(callaway rm)

Refined by: Web of Science Categories=(ECOLOGY OR ENVIRONMENTAL SCIENCES OR SOIL SCIENCE OR PLANT SCIENCES OR GENETICS HEREDITY OR BIOTECHNOLOGY APPLIED MICROBIOLOGY OR FORESTRY OR AGRONOMY OR ENTOMOLOGY OR MULTIDISCIPLINARY SCIENCES OR BIOCHEMISTRY MOLECULAR BIOLOGY OR GEOGRAPHY PHYSICAL OR BIODIVERSITY CONSERVATION OR BIOLOGY OR EVOLUTIONARY BIOLOGY)

Timespan=All years. Databases=SCI-EXPANDED, SSCI, A&HCI.

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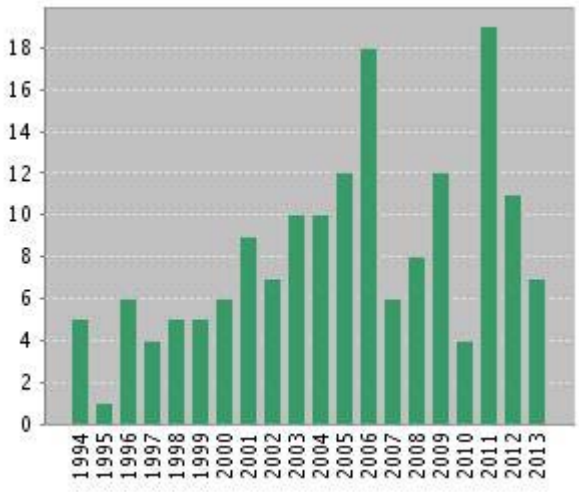
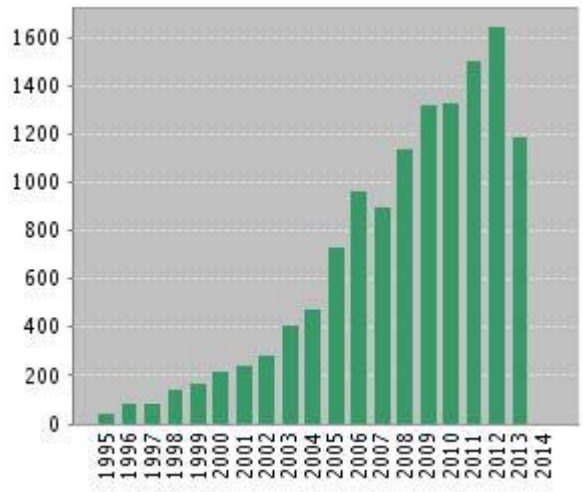
Published Items in Each Year



The latest 20 years are displayed.
View a graph with all years.

Citations in Each Year



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Results found:	**177**
Sum of the Times Cited [?] :	**12947**
Sum of Times Cited without self-citations [?] :	**11923**
Citing Articles[?] :	**6665**
Citing Articles without self-citations [?] :	**6507**
Average Citations per Item [?] :	**73.15**
h-index [?] :	**61**

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	2010	2011	2012	2013	2014	Total	Average Citations per Year
	1334	1509	1643	1191	0	12947	517.88
1. Title: **Competition and facilitation: A synthetic approach to interactions in plant communities** Author(s): Callaway, RM; Walker, LR Source: ECOLOGY Volume: **78** Issue: **7** Pages: **1958-1965** DOI: **10.1890/0012-9658(1997)078[1958:CAFASA]2.0.CO;2** Published: **OCT 1997**	66	75	59	58	0	763	44.88
2. Title: **Positive interactions among plants** Author(s): Callaway, RM Source: BOTANICAL REVIEW Volume: **61** Issue: **4** Pages: **306-349** DOI: **10.1007/BF02912621** Published: **OCT-DEC 1995**	56	63	53	43	0	739	38.89
3. Title: **Positive interactions among alpine plants increase with stress** Author(s): Callaway, RM; Brooker, RW; Choler, P; et al. Source: NATURE Volume: **417** Issue: **6891** Pages: **844-848** DOI: **10.1038/nature00812** Published: **JUN 20 2002**	59	60	68	49	0	568	47.33
4. Title: **Invasive plants versus their new and old neighbors: A mechanism for exotic invasion** Author(s): Callaway, RM; Aschehoug, ET Source: SCIENCE Volume: **290** Issue: **5491** Pages: **521-523** DOI: **10.1126/science.290.5491.521** Published: **OCT 20 2000**	51	62	57	30	0	531	37.93
5. Title: **Allelopathy and exotic plant invasion: From molecules and genes to species interactions** Author(s): Bais, HP; Vepachedu, R; Gilroy, S; et al. Source: SCIENCE Volume: **301** Issue: **5638** Pages: **1377-1380** DOI: **10.1126/science.1083245** Published: **SEP 5 2003**	40	36	38	19	0	434	39.45
6. Title: **Facilitation in plant communities: the past, the present, and the future** Author(s): Brooker, Rob W.; Maestre, Fernando T.; Callaway, Ragan M.; et al. Source: JOURNAL OF ECOLOGY Volume: **96** Issue: **1** Pages: **18-34** DOI: **10.1111/j.1365-2745.2007.01295.x** Published: **JAN 2008**	71	91	78	66	0	395	65.83
7. Title: **Novel weapons: invasive success and the evolution of increased competitive ability** Author(s): Callaway, RM; Ridenour, WM Source: FRONTIERS IN ECOLOGY AND THE ENVIRONMENT Volume: **2** Issue: **8** Pages: **436-443** DOI: **10.1890/1540-9295(2004)002[0436:NWISAT]2.0.CO;2** Published: **OCT 2004**	41	47	56	44	0	326	32.60

Use the checkboxes to remove individual items from this Citation Report or restrict to items published between 1900 and 2014 Go

	2010	2011	2012	2013	2014	Total	Average Citations per Year
	1334	**1509**	**1643**	**1191**	**0**	**12947**	**517.88**
8. Title: **Soil biota and exotic plant invasion** Author(s): Callaway, RM; Thelen, GC; Rodriguez, A; et al. Source: NATURE Volume: **427** Issue: **6976** Pages: **731-733** DOI: **10.1038/nature02322** Published: **FEB 19 2004**	33	34	36	30	0	293	29.30
9. Title: **A biogeographical approach to plant invasions: the importance of studying exotics in their introduced and native range** Author(s): Hierro, JL; Maron, JL; Callaway, RM Source: JOURNAL OF ECOLOGY Volume: **93** Issue: **1** Pages: **5-15** DOI: **10.1111/j.1365-2745.2004.00953.x** Published: **FEB 2005**	39	40	36	26	0	272	30.22
10. Title: **Facilitation and competition on gradients in alpine plant communities** Author(s): Choler, P; Michalet, R; Callaway, RM Source: ECOLOGY Volume: **82** Issue: **12** Pages: **3295-3308** DOI: **10.1890/0012-9658(2001)082[3295:FACOGI]2.0.CO;2** Published: **DEC 2001**	32	29	31	27	0	265	20.38

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29 October 2013

Dear Dean Janson;

While others will comment on Ray's teaching credentials, I choose to focus on some well known metrics used in national/international science that give clear insight into the research reputation of Ray Calloway.

The Thomson-Reuters agency has been compiling Highly Cited Researchers for many years. They define this category as:

"Highly Cited Research reveals the face of research—the people behind the accomplishments in 21 broad subject categories in life sciences, medicine, physical sciences, engineering and social sciences. These individuals are the most highly cited within each category, and comprise less than one-half of one percent of all publishing researchers—truly an extraordinary accomplishment. The most recent analysis covered papers from 1981-2008."

Currently only four faculty in all of the University of Montana from all categories are listed as Highly Cited Researchers:

Name	Category
Thomas Martin	Ecology/Environment
Steven Running	Ecology/Environment
Ragan Callaway	Ecology/Environment
Fred Allendorf	Ecology/Environment

A second valuable metric, from the Web of Science is the Citation Analysis report done for an academic author, including the well known h-index. This analysis not only measures how many journal articles a person has written, but how often those papers are cited by the broader scientific community. This analysis measures the collective interest the scientific community in your field has expressed in your work over decades.

As defined by WoS, The h-index is indicated by an orange horizontal line going through the Year / Total Year columns. The number of items above this line, which is "h" have at least "h" citations. An h-index of 61 means there are 61 items that have 61 citations or more.

Ray Callaway's Citation Analysis shows 211 published papers and 14,236 citations of his work by the broader scientific community. His top three papers each have been cited over 700 times,

and his h-index is 61. (I was on the Fellows selection committee of the American Geophysical Union for 6 years, reviewing hundreds of scientists nomination packets, and I only saw an h-index greater than 60 a handful of times across all geophysical fields of research.)

While these statistics may seem fiddly to some, they are the most honest assessment of a scientist's impact in their field yet devised, and are now used widely for promotion/tenure decisions. Publishing many trivial papers in second rate journals doesn't help an author, because no one else will cite them. Also, having one or two big papers but nothing else doesn't measure well. It is nearly impossible to game the system, this analysis measures career long research performance. The only way Ray Calloway could reach an h-index of 61 is with decades of top quality research that the international ecological community read and cited. These citation metrics for Ray are certainly in the 99.7% or higher percentile of academics worldwide in ecological science publishing.

Sincerely,

Steve Running, Director, NTSG
Regents Professor
Dept of Ecosystem and Conservation Science

UNIVERSITY of HOUSTON

DEPARTMENT OF BIOLOGY AND BIOCHEMISTRY

September 25, 2013

Dr. Charlie Janson
Associate Dean
Division of Biological Sciences
University of Montana
Missoula, MT 59812

Dear Dr. Janson,

It is a pleasure to recommend Dr. Ragan Callaway for the title of Regent's Professor. His record is so outstanding that it is hard to know where to begin with the superlatives.

You have his CV and can see that it is exceptional not just for the quantity of publications (~190, counting book chapters) but also for their high quality. I counted ten publications in the best journals in science (Science, Nature, PNAS) and ~60 in the best journals in the field of ecology (Ecology, Journal of Ecology, Ecology Letters, American Naturalist). These publications are cited heavily. A quick Web of Science search indicates that 38 of Ray's publications have been cited over 100 times each, that he has on the order of 13,000 total citations, and that his h-index is a ridiculously high value (61). These statistics are at a stratospheric level that is achieved by only the most influential ecologists.

Ray is well known internationally for his work on positive interactions in plant communities. His work on this topic has virtually defined the field. Not only has he literally "written the book" on the topic, he also has published a series of very influential review and primary research papers in this area. Although positive interactions featured prominently in early ecological theory, they were almost ignored for decades thereafter, until Ray and Mark Bertness began working on them. Ray is the world leader in reminding us that positive interactions play an important role in the organization of many communities, and that interspecific interactions can be composed of a complex balance of negative and positive interactions that shift in importance depending upon abiotic conditions. His work has changed the way ecologists think about communities, and has generated a revival of interest in positive interactions. The greatest testament to his influence is the torrent of "copy-cat" publications on positive interactions that have appeared over the two decades in international journals.

Ray is also well known internationally for his work on invasive species. Historically, work in this field was dominated by a small number of hypotheses that more often than not failed to generate insight into the mechanisms by which exotic plants become invasive. Ray has transformed the field by proposing and testing new hypotheses. In particular, his work on novel chemical defenses and on plant-soil feedbacks via microbial communities has stimulated new avenues of research into invasive plants. In the process, this work on exotic species has also

UNIVERSITY of HOUSTON

DEPARTMENT OF BIOLOGY AND BIOCHEMISTRY

generated a more complete understanding of how communities comprised of native species function.

In pursuing both these topics, Ray has assembled diverse coalitions of international collaborators. These collaborations have greatly benefitted the careers of many of these international scientists, and have stimulated the progress of environmental science in their home countries. Honestly, Ray should get an award from the United Nations for his achievements in stimulating science internationally.

Although his work on positive interactions and invasive species has brought him the most attention, Ray has conducted work of excellent quality on a variety of other topics and in a diversity of habitats. In conversation I am continually impressed at how much he knows about such a wide variety of ecosystems. He is a broad thinker and has broad skills, and his work consistently addresses the biggest questions in ecological theory.

In summary, Ray is a leading international scholar in the field of ecology. Everyone in the field knows, respects and cites his work. He's one of the intellectual leaders of our field. He is a credit to the University of Montana, and well-deserving of the title of Regent's Professor.

Sincerely,

Steven C. Pennings
John and Rebecca Moores Professor

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THE UNIVERSITY OF BRITISH COLUMBIA | OKANAGAN

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October 23, 2013

Dr. Charlie Janson
Associate Dean
Division of Biological Sciences
The University of Montana
Missoula, MT 59812

Dear Dr. Janson,

It is a pleasure to write this letter of support for Dr. Ragan (Ray) Callaway's nomination for the title of Regents' Professor in the Montana University System. I have known Dr. Callaway for over 12 years. We met during my first visit to Missoula - a meeting that I remember vividly. He immediately made an impression on me - a man who is driven by curiosity and is very passionate about his work, who is highly supportive of his students, and who believes that teaching and research should be integrated and not separated into different silos (as they often are in Universities). Over the past decade, I have had the privilege of collaborating with him on several research projects, and my positive opinion of him as an academic is even stronger.

In my opinion, Dr. Callaway deserves the honour of the title (Regent's Professor).

Without any doubt, Dr. Callaway has become a leading figure in ecological research in North America and worldwide in the area of plant community ecology. This is easy to verify considering the enormous output of high-quality research papers (not least-publishable units), featured in top science outlets such as *Nature, Science, PNAS, Ecology, and Ecology Letters*. He invariably makes a huge impression at international meetings, and is widely recognized by his peers as a brilliant experimentalist. His gift to convincingly tackle problems in ecology that seem, at best, difficult to address experimentally is truly remarkable. I think it is the combination of an unusual knack for the experimental solution to a complex problem combined with his insistence on collecting supporting field data that has earned him his reputation for excellence. His strength is the ability to think conceptually, and to design studies that get to the core of those concepts. One additional comment on his general strengths as a researcher - he has a strong ability to forge productive collaborations with other scientists from around the world. My sense is that he recognizes that any one individual brings a defined set of expertise to a project, and he has a natural ability to get others (with complementary expertise) to join him on his quest to solve scientific problems. He is a connector. I have never met anyone like Dr. Callaway in this regard. He excels at interacting with people and in getting them excited to collaborate on his research.

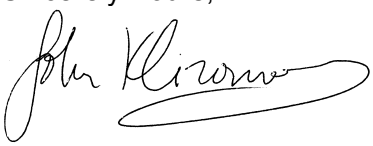
Some of his research is classic, especially his body of literature on the biogeography of invasive species. He began much of this research with one plant species (spotted knapweed), but backed it up with a large number of studies on many other invasive plants (studies that focused on the broad geographic range of these organisms). As a result, he has been able to develop general mechanisms for invasiveness. His most famous work, in my opinion, was showing how species within communities interact

positively (facilitation), and how such interactions can influence the structure and functioning of communities. He has a large body of literature in this area, and in my opinion provides balance to our understanding of the mechanisms underlying community ecology (which have traditionally focused on the importance of negative interactions, such as competition). He is well recognized for these contributions and his papers are highly cited.

Dr. Callaway has also done an excellent job with the training of highly qualified personnel. His students and post-docs publish on a regular basis, in top-tier journals and most have gone on to successful careers. I have met some of his past students, and they have attested that Dr. Callaway has proven to be an incredible asset to any graduate program. First, he provides his students with access to high quality research questions, coming naturally out of his research program. He is patient, friendly, dedicated, and has a good sense of humour. He also has the all-important ability to help students focus their research, and he is clearly ahead of the pack in terms of design, analysis and scientific method. At conferences I have noticed he is supportive of his students and showcases their research and successes, making distinct his own research from that of his students'. As such, Dr. Callaway is instrumental in educating future leaders in ecology and environmental biology. I note that he was recently awarded as an Undergraduate Research Faculty Mentor by the Honors College. I think that this is a great choice, when considering his commitment to students.

Dr. Callaway is often called upon to give invited seminars on his research. Such invitations come from departments and institutes from around the world. He has won a number of awards (and was even nominated by a long list of international colleagues for the highly prestigious MacArthur Award by the Ecological Society of America – although he did not win it), and my feeling is that this is only the beginning. I predict that Dr. Callaway will continue to get further recognition for his contributions to our understanding of terrestrial ecology. I also note that he has taken on a major administrative responsibility as Director of the Montana's state-wide EPSCoR grant program. This is major recognition (and a ton of work), and I can think of no-one better suited to administer the program that is so important for local research. Overall, Dr. Callaway is a world-class researcher, and again, I highly support his nomination for a Regent's Professorship.

Sincerely Yours,



John Klironomos
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NORTHERN ARIZONA UNIVERSITY
College of Engineering, Forestry & Natural Sciences

November 11, 2013

Dr. Charlie Janson, Associate Dean
Division of Biological Sciences
University of Montana
Missoula, MT 59812 - Ph: 406-243-5122; FAX: 406-243-4184

Dear Dr. Janson,

I am delighted to give Dr. Ray Callaway an outstanding letter of support for the Regents' Professorship at the University of Montana. I have known Ray's work for many years. I first became aware of his work when I attended a symposium where he was a featured speaker at the annual meetings of the Ecological Society of America. His talk on exotic invasions and microbial interactions blew me away. For me, his talk was the highlight of this major international conference and has stuck with me over the years. I felt I was witnessing a game changer in understanding how exotic plants can become invasive through interactions with the microbial community. While many of the speakers in the symposium were floundering away with complex technologies and not really coming up with much definitive to say, Ray's work struck me as elegantly simplistic and straightforward in interpreting complex interactions. I think this research approach is one of Ray's trademarks; he is renown throughout the research community as an experimentalist; it stands out in his publications and the research of his students. This is high praise from me as I feel few researchers are Ray's equal in this regard.

Another area of Ray's research expertise is facilitation, in which one plant benefits another, but the reverse is not necessarily true. Ray's work has played a major leadership role in bringing this field to international attention and spawned countless research programs and graduate research worldwide. Because facilitation increases with environmental stress, it becomes even more important in the context of global change. Thus, in today's environments two species of plants may compete, but in tomorrow's more stressful environments, the relationship may switch to facilitation. Such research will continue to expand and it will largely be based on principles laid down by Ray and his colleagues.

With nearly 200 publications in journals such as Science, Nature, PNAS, Ecology Letters, Trends in Ecology and Evolution, Ecology, and Global Change Biology, and one book to his credit, Ray has an envious publication record in the premier international journals. These landmark publications go along with major research funding, invited presentations all over the world, and a great laboratory group with some of the best graduate students and post docs I have had the pleasure to meet. His students have won numerous key awards and have been very successful in their careers. For example, one of Ray's students, Dean Pearson, who graduated in 2005, is now the Deputy Program Manager of Wildlife and Terrestrial Ecosystems for the Rocky Mountain Research Station. This is in part due to a seminal, co-authored paper with Ray that

appeared in Ecology Letters. This study has become a classic example of biocontrol gone awry in which the biocontrol of an invasive plant can result in an increase of a human disease. Such graduate mentoring also extends to the undergraduate level. This fall the Honors College recognized him as an Undergraduate Research Faculty Mentor. He also has become the Director of Montana's state-wide EPSCoR grant, which represents a major service commitment and will have a major impact on the future of science research in Montana for many years to come.

Ray has played an important role in promoting international collaborations that expand the prestige of the University of Montana and the exchange of ideas. For example, he has organized an international team of scientists that study alpine zones around the world. This group meets annually and coordinates research on common themes like facilitation, which has resulted in numerous publications. This group has been funded by several international science foundations that have recognized the important role this group can play in promoting international collaborations. Similarly, he has promoted an international effort to investigate the mechanisms driving exotic plant invasions in North America, South America, and Australia involving scientists from the UK, the Republic of Georgia, Romania, Uzbekistan, Switzerland, France, Spain, Turkey, Argentina, Chile, and Australia. Such efforts are of major importance and will result in payoffs that can change the next generation of scientists. This is further reflected in an international cast of visiting scientists that Ray has brought to the Univ. of Montana from China, Hungary, Scotland, Mexico, France, Switzerland, Romania, Australia, Georgia, Germany, Canada, Turkey, Spain, Chile, and India. This is really an impressive feat that few scientists have accomplished and reflects greatly on Ray's international stature.

All of these impressive accomplishments have led Ray to be nominated for the MacArthur Award, one of the highest awards of the Ecological Society of America. In short, I have nothing but great things to say about Ray's research, mentoring, teaching, and international stature. He is one of the most deserving recipients of Regents' Professor status that I can think of and he would be an ideal candidate of this promotion at any university in the country.

Sincerely,

Thomas G. Whitham, Regents' Professor
Department of Biological Sciences &
Executive Director, Merriam-Powell Center for Environmental Research
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15 November, 2013

To: Perry Brown, Provost
From: Christopher Comer, Dean of Arts & Sciences
Re: Regents Nomination of Prof. Ray Callaway

It is a distinct pleasure to submit this file on Dr. Ray Callaway for consideration as a Regents Professor for the University of Montana system. As you will see, Ray's nomination was initiated by his colleagues in the Division of Biological Sciences. I have reviewed the entire file and wish to add my strong endorsement of his candidacy.

Ray's CV is weighty in the best sense of that term. First, he has had a distinguished teaching career at the University of Montana. He has taught an array of important courses in our ecology curriculum and he has trained a dozen doctoral students – and many of his students have won awards. You will note also that he is sought for doctoral committees at other universities on a world-wide basis. In service, he has been no stranger to major committee work within DBS and across the campus. His service to his discipline has been widespread, novel (he founded several of the groups mentioned in his CV), and of international scope.

His contributions to biological research are impressive by any measure. Hold that CV in your hands and you are accounting for almost 200 scholarly publications. As our own Nobel Laureate Steve Running notes, the decidedly quantitative measures of publishing impact used by the natural sciences indicate that he is easily in the top 1% of scientists internationally in ecology. DBS has chosen highly regarded external scientists who are themselves of Regent's professor caliber and their comments are revealing: Ray is described as a "world leader" (Pennings), his ability to tackle difficult problems is characterized as "remarkable" (Klironomos), and his presentation at a major scientific meeting was described as "witnessing a game changer" in the direction of the field (Whitham). This is high praise from a group of accomplished biologists.

What I personally would most like to emphasize is the global reach of Ray Callaway's science. He is putting our reputation in the best of possible lights on an international stage. We could hardly ask for more that that. Dr. Ray Callaway richly deserves the honor of a Regent's professorship and I hope his documents will be seen that way as they continue to be reviewed by the campus and the Board of Regents

Ragan Morrison Callaway
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EMAIL: ray.callaway@mso.umt.edu

Education:

B.A.	Westmont College	June, 1978
M.S.	University of Tennessee	June, 1983
Ph.D.	University of California, Santa Barbara	June, 1990

Employment History:

Professor	The University of Montana	2002 – present
Associate Professor	The University of Montana	1998 - 2002
Assistant Professor	The University of Montana	January 1993-1998
Postdoctoral Research	University of California, Santa Barbara	June, 1990- October 1991
	University of Illinois-Duke University (joint)	November, 1991- January 1993

Teaching:

Community Ecology (UM517), Biogeography (UM430), Vegetation Sampling and Analysis (UM595), Current Trends in Plant Ecology (UM500), Diversity of Life (UM100), Rocky Mountain Flora (UM350), Introductory Ecology (UM121), Ecology (UM340-341), Judeo-Christian Perspectives on Nature (UM395), Alpine Ecology (UM459), Flora of the Black Hills, Field Ecology, Rocky Mountain Field Botany, General Botany.

University of Montana Service

Current State Project Director for NSF-EPSCoR; Athletic Committee (3 years); Graduate Research Council (3 years); Organismal Biology and Ecology Program Director (3 years); College of Forestry - search committee for Forest Ecologist; College of Forestry - search committee for Soils Biologist; Division of Biological Sciences search committee for Aquatic Ecosystem Ecologist, Chair; Division of Biological Sciences search committee for Community Ecologist, Chair; Division of Biological Sciences, search committee for Ecophysiologist, Chair; Associate Provost - Advisory Committee; Search Committee for Vice-President of Research; Graduate Committees while at UM – 41.

Peer reviewed publications:

Maron, J.L., J. Klironomos, L. Waller and R.M. Callaway. *In press*. Regional scale sampling reveals that invasive plants escape from suppressive soil biota. *Journal of Ecology*.

Rout, M.E., T.H. Chrzanowski, T.K. Westlie, T.H. DeLuca, R.M. Callaway and W.E. Holben. *In press*. Bacterial endophytes enhance invasive plant competition. *American Journal of Botany*.

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Qin, R. Y. Zheng, A. Valiente-Banuet, R.M. Callaway, G.F. Barclay, C.S. Pereyra and Y. Feng. *In press*. The evolution of increased competitive ability, innate competitive advantages, and novel biochemical weapons act in concert for a tropical invader. *New Phytologist*.

Xiao, S. R.M. Callaway, G. Newcombe, and E.T. Aschehoug. *In press*. Models of experimental competitive intensities predict home and away differences in invasive impact and the effects of an endophytic mutualist. *American Naturalist*.

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Metlen, K.L., E.T. Aschehoug and R.M. Callaway. *In press*. Competitive outcomes between two exotic invaders are modified by direct and indirect effects of a native conifer. Oikos.

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Callaway, R.M., U. Schaffner, G.C. Thelen, A. Khamraev, T. Juginisov and J.L. Maron. *In press.* Impact of *Acroptilon repens* on co-occurring native plants is greater in the invader's non-native range. *Biological Invasions* DOI 10.1007/s10530-011-0145-1.

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Callaway, R.M. 2007. *Positive Interactions and Interdependence in Plant Communities*. Springer, Dordrecht, The Netherlands. ISBN 978-1-4020-6223-0 (HB)

Book Chapters

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Editorial and Service Boards

Ecology, *Trends in Ecology and Evolution*, *Journal of Ecology*, NSF Panel member (5x), EU Science Foundation panel member; German National Science Foundation, external review

University of Montana Service

Athletic Committee (3 years); Graduate Research Council (3 years); Organismal Biology and Ecology Program Director (3 years); College of Forestry - search committee for Forest Ecologist; College of Forestry - search committee for Soils Biologist; Division of Biological Sciences search committee for Aquatic Ecosystem Ecologist, Chair; Division of Biological Sciences search committee for Community Ecologist, Chair; Division of Biological Sciences, search committee for Ecophysiologist, Chair; Associate Provost - Advisory Committee; Search Committee for Vice-President of Research; Graduate Committees while at UM – 36.

External Graduate Committee Service

Graduate committee or external reviewer evaluator at Guelph University, Canada; University of Delhi, India; Otago University, New Zealand; University of British Columbia, Canada; Joseph Fourier University, France; University of Regina, Canada; University of Wollongong, Australia; Wagenin

University, Holland; University of Berne, Switzerland; Univeristy of KwaZulu, Natal , Sao Paulo University, Brazil

Broader External Service

International committee for the progress of ecological scientific progress in Finland – I was part of a 10 person committee assigned to evaluate the status of research productivity and success at all Finnish research institutions.

British Ecological Society Special Symposium on Facilitation – in April 2009 I participated in the organization of a special BES symposium in Aberdeen, Scotland.

Alpine Pals - I developed and currently lead an international team of 11 scientists (the Alpine Pals) working on alpine ecology in over 10 countries and on four continents. We have been funded for research and workshops by the National Science Foundation, the Civilian Research and Development Foundation, National Geographic, and European sources.

Invasive Weed Coalition – I have organized a loose working group for the investigation of the mechanisms driving exotic plant invasions in North America, South America, and Australia involving scientists from the UK, the Republic of Georgia, Romania, Uzbekistan, Switzerland, France, Spain, Turkey, Argentina, Chile, and Australia.

Scientific Development in the Republic of Georgia – Through the Civilian Research and Development Foundation I coordinated and chaired a workshop in Kazbegi, Georgia for the purpose of advancing science in the Caucasus region. To this end I promoted collaborations among American, European, and Georgian scientists. This effort involved pairing Georgian scientists with American and/or European counterparts, bringing them together at the research station in Kazbegi, and working with them to develop scientific proposals.

Ecological Workshops, Chile – In January, 2003 and January 2008, I organized a workshops invited by the University of Concepcion, Chile, to develop plant ecological studies in Chile.

Co-organizer for a special *British Ecological Society* meeting held in Aberdeen, Scotland in April 2009 on facilitation.

Letters for evaluation of promotion or tenure - 33

Student Awards

NSF Poster Competition Travel Award – Marnie Rout
MILES Fellowship – Rebecca Fletcher
MILES Fellowship – Ryan Graebner
NSF Predoctoral Fellowship – Erik Aschehoug
NSF Predoctoral Fellowship – Dan Atwater
Co-PI, NSF Ecology Panel funding – Dean Pearson
NSF Dissertation Improvement Grant – Jose Hierro
MILES Fellowship - Tom Bassett, National Award for Research
MILES Fellowship - Melissa Farrell
Project IBS-CORE Undergraduate Research Fellow - Levi Besaw
McIntire-Stennis Grant – Kerry Metlen
Ecological Society of America, best talk in Microbial Ecology – Marnie Rout
Tansley Award – Kurt Reinhart
Outstanding Student Presentation, ESA, Soil Ecology Section – Andrea Thorpe
McNair Fellowship – Maureen Murphy
Philanthropic Education Organization Award – Beth Newingham

Philanthropic Education Organization Award – Andrea Thorpe

International Visitors brought to the University of Montana through my lab

Dr. Wei-ming He, China; Dr. Robert Pal, (Fulbright Fellow) Hungary; Dr. Robert Brooker, Scotland; Dr. Alfonso Valiente-Banuet, Mexico; Dr. Richard Michalet (sabbatical), France; Dr. Lohengrin Cavieres, Chile (sabbatical); Dr. Urs Schaffner, Switzerland; Dr. Alecu Diaconu, Romania; Dr. Yulong Feng, China (sabbatical); Dr. Jose Facelli, Australia (sabbatical); Dr. Zaal Kikvidze, Republic of Georgia; Dr. Wolfgang Weisser, Germany; Dr. John Klironomos, Canada; Ozkan Eren (international PhD), Turkey; Dr. Daniel Montesinos, Spain (international postdoc); Dr. Rosario Gavilan, Spain (sabbatical); Dr. Francisco Pugnaire, Spain; Dr. Chris Lortie (international postdoc) Canada; Guangyan Ni (international PhD), China; Wang Shu (International PhD), China; Fernando Maestre (international PhD), Spain; Pablo Beccara, (international PhD), Chile; Dr. Inderjit, India. Dr. Lixue Wang, China, Dr. Wenbo Luo, China; Dr. Robert Pal (Marie Curie Fellowship).

PhD Students Graduated

Beth Newingham, Kurt Reinhart, Dayna Baumeister, Dean Pearson, Andrea Thorpe, Jose Hierro, Wendy Ridenour, Kerry Metlen, Marnie Rout, Erik Aschehoug, Dan Atwater.

Grants and Contracts

National Science Foundation. The Role of Soil Microbes in Plant Invasions: Inhibition at Home and Facilitation Away? $625,000 (with John Maron); September 2006-August 2010.

Civilian Research and Development Foundation. The importance of human disturbance and soil biota in exotic plant invasions: home versus abroad. $62,000 (with Liana Khetsuriani and Jose Hierro); May 2006-April 2008.

Andrew W. Mellon Foundation. Macroecological experiments in alpine community ecology: coordinating complex experiments with colloquia. $60,000; June 2006-May 2009.

USDA-IPM. Integrated control of spotted knapweed, utilizing spotted knapweed resistant native plants to facilitate re-vegetation. (with Jorge Vivanco and Mark Pashcke) $179,916

Department of Defense, SERDP. Control of *Centaurea* species on Department of Defense land: plant and microbial resistance (with Jorge Vivanco and Scott Pashcke). $1,880,314; $595,142 to UM.

U.S.D.A. Joint Venture 04-JV-11222044-235. Effects of charcoal from different fuels and fire severities on the demography and phytotoxic impacts of spotted knapweed following wildfire. $86,000.

N.S.F. International Grant. Romania and U.S.A. Biogeographical comparison of the effects of Centaurea maculosa. $71,000. (NSF 0331964).

N.S.F. (DEB-0236061) *Urophora*-induced increases in deer mouse populations and their indirect effects. With Dean Pearson. $294,267, 2003-2007.

U.S.D.A. N.R.I. (2003-02433) *Centaurea* invasion: from molecules and microbes to plant communities. With Jorge Vivanco and William Holben, $200,000.

Civilian Research and Development Foundation. USA–Georgia Collaboration in Ecology. $35,000.

N.S.F. Biocomplexity Grant. With Jack Stanford, Ric Hauer, and many others. $2,700,000.

U.S.D.A. N.R.I. (2003-02433) *Centaurea* invasion: from molecules and microbes to plant communities. With Jorge Vivanco and William Holben, $200,000.

N.S.F. International Supplement to "The role of mycorrhizae in mediating interactions in invaded communities in the intermountain prairie." Soil microbes and recipient communities for *Centaurea solstitialis* in Argentina. $12,000.

N.S.F. International Supplement to "The role of mycorrhizae in mediating interactions in invaded communities in the intermountain prairie." Ecological functions of the invasive *Centaurea solstitialis* in its native Turkey. $11,500.

USIA Fulbright Scholar Program, CIES. Soil microbial communities and the invasion of *Cenchrus biflorus* in the Okavango Delta, Botswana. $67,000.

U.S.D.A. Joint Venture. The effectiveness of *Agapeta zoegana* in burned and unburned grasslands. $30,000.

National Center for Ecological Synthesis and Analysis. Facilitation and competition on alpine elevation gradients: a global experiment on the organization of plant communities. $70,000. With Richard Michalet, Robert Brooker, and Chris Lortie.

N.S.F. International Supplement to "The role of mycorrhizae in mediating interactions in invaded communities in the intermountain prairie. $11,800. With Dr. Cathy Zabinski.

N.S.F. S.G.E.R. The indirect effects of biocontrols: do *Urophora*-induced increases in deer mouse populations also increase the consumption of native seeds and the abundance of hanta virus? $25,000.

Murdock Foundation. Have native grasses in the northern Rocky Mountains evolved in their interactions with spotted knapweed? $10,000. With Trevor Laboski at Corvallis High School.

National Geographic Research Foundation. Competition and facilitation along alpine stress gradients: a global experiment in plant ecology. $15,000.

U.S.-Spain Science and Technology Cooperation. Positive interactions among higher plants along a gradient of abiotic stress. $10,000. With Dr. Francisco Pugnaire.

Andrew W. Mellon Foundation. Co-evolution in plant communities: the effect of biogeographical allopatry on interactions among plants. $360,000.

Civilian Research and Development Foundation. Indirect interactions among plants: the positive effects of unpalatable plants on tasty neighbors, and mycorrhizal mediation of the competitive effects of a noxious weed. $52,000. With Dr. Liana Khetsuriani.

U.S.D.A. Competitive Grants Program, Weeds. 98-35315-6068. Assessing the effects of tree genotype and abiotic stress on dwarf mistletoe success using a new PCR assay. $130,000. With Dr. Eileen Carey.

U.S.D.A. Joint Venture. Restoring old growth fire-maintained ponderosa pine and larch stands. $35,000. With Anna Sala.

N.S.F. DEB-9726829. The role of mycorrhizae in mediating interactions in invaded plant communities in intermountain prairie. $200,000. 1998-2001. With Cathy Zabinski.

U.S.D.A. Competitive Grants Program. 96-218890-8856. Dwarf mistletoe and biomass allocation, gas-exchange, and water relations of Douglas-fir and western larch. $207,400.

Civilian Research and Development Foundation. GB-117. The role of positive interactions in the conservation of plant communities in the mountains of the central Caucasus and northern Rockies. $52,000. With Dr. Zaal Kikvidze.

Invited Speaking during the last 15 years

Callaway, R.M. 1997. Positive interactions and the structure of plant communities. *Invited Seminar*. University of British Columbia.

Callaway, R.M. 1997. Parasitic plants, community structure, and diversity in a western salt marsh. *Invited Seminar*. University of British Columbia.

Callaway, R.M. 1998. Succession maintains forest productivity in subalpine forests of the northern Rocky Mountains. *Invited Seminar*. University of California, Berkeley.

Callaway, R.M., Kikvidze, Z. and D. Kikodze. 1998. Positive effects of unpalatable weeds conserve plant diversity In intensely grazed alpine plant communities. Ecological Society of America, 83rd Meeting, Baltimore, Maryland, August 2-6.

Callaway, R.M., Kikvidze, Z. and D. Kikodze. 1998. Positive effects of unpalatable weeds conserve plant diversity In intensely grazed alpine plant communities. INTECOL, VII International Congress of Ecology, Florence, Italy 19-25 July.

Callaway, R.M. 1998. Positive interactions and the structure of plant communities. *Invited Seminar*. University of Illinois.

Callaway, R.M. and Z. Kikvidze. 1999. Direct and indirect positive interactions in the Caucasus Mountains of the Republic of Georgia. *Invited Award Presentation for the Civilian Research and Development Foundation,* AAAS, Washington D.C.

Callaway, R.M. 1999. Positive interactions and the structure of plant communities. *Invited seminar,* Joseph Fourier University, Grenoble France.

Callaway, R.M. 1999. Positive interactions and the structure of plant communities. *Invited seminar,* Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier, France.

Callaway, R.M. 1999. Positive interactions and the structure of plant communities. *Invited seminar,* Northern Arizona University.

Callaway, R.M. 1999. Positive interactions and the structure of plant communities. *Invited seminar,* Center for Ecological Synthesis and Analysis, Santa Barbara, California.

Callaway, R.M. 1999. Mechanisms of exotic plant invasion: *Centaurea maculosa* in the Northern Rocky Mountains. *Invited seminar,* University of California, Santa Barbara.

Callaway, R.M. 1999. Herbivory in plant communities: indirect interactions. *Invited seminar*. University of California, Santa Barbara.

Callaway, R.M. and C. Tyler. 1999. Facilitation in rangelands: direct and indirect effects. *Invited seminar.* International Rangeland Congress Symposium, Townsville, Australia.

Zabinski, C.A. and R.M. Callaway. 1999. Mycorrhizal effects on species interactions in native and invaded grassland communities. Ecological Society of America, 84th Meeting, Spokane, Washington. August 8-12, 1999.

Sala, A., R.M. Callaway, E.V. Carey, and R.E. Keane. 1999. Water use in whitebark pine and subalpine fir: does fire exclusion increase stand water use in subalpine forests? Ecological Society of America, 84th meeting, Spokane, Washington. August 8-12, 1999.

Newingham, B. and R.M. Callaway. 1999. Are insect biocontrols effective? Insect herbivory does not effect the competitive ability of an invasive plant, spotted knapweed. Ecological Society of America, 84th Meeting, Spokane, Washington. August 8-12, 1999.

Callaway, R.M. 1999. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa,* why biocontrols might fail. *Invited seminar.* University of Massachusetts.

Callaway, R.M. 2000. Positive interactions and the organization of plant communities. *Invited seminar,* Banchory Ecological Research Centre, Banchory, Scotland.

Callaway, R.M. 2000. Shifts in competitive and facilitative interactions in alpine plant communities along elevational gradients. *Invited seminar.* Lautaret Research Station, Lautaret, France.

Callaway, R.M. 2000. Biocontrols, compensatory growth and *Centaurea maculosa. Invited seminar.* International Weed Science Conference, Iguasu Foz, Brazil.

Callaway, R.M. 2000. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* University of Michigan.

Callaway, R.M. and E.T. Aschehoug. 2000. Co-evolution in plant communities: invaders interact differently with new neighbors than with old ones. Ecological Society of America Meeting, Snowbird, Utah.

Corcket, E. R.M. Callaway, and R. Michalet. 2000. Insect herbivory alters competitive interactions in meadows in the French Alps. Ecological Society of America Meeting, Snowbird, Utah.

Newingham, B.A., C.A. Zabinski, R. Michalet, and R.M. Callaway. 2000. Insect herbivory alters competitive interactions in meadows in the French Alps. Ecological Society of America Meeting, Snowbird, Utah.

Sala, A., E.V. Carey, and R. M. Callaway. 2000. Size-dependent hydraulic sufficiency in conifers is strongly influenced by leaf to sapwood ratios. Developing and ageing in forest trees. COST Action E6 Eurosilva. Forest Tree Physiology Research. Florence, Italy

Sala, A., E.V. Carey, and R. M. Callaway. 2000. Water transport in large northern Rocky Mountain conifers is not always limited. Ecological Society of America Meeting, Snowbird, Utah.

Callaway, R.M. 2001. Functional group versus species-specific approaches to positive interactions in plant communities. *Invited symposium speaker.* 86th Annual Meeting of the Ecological Society of America, Madison, Wisconsin.

Zabinski, C.A., L. Quinn, and R.M. Callaway. 2001. A test of carbon transfer via mycorrhizal linkages between invasive and native grassland species. 86th Annual Meeting of the Ecological Society of America, Madison, Wisconsin.

Callaway, R.M. 2001. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* University of Toronto.

Callaway, R.M. 2001. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* University of Washington.

Callaway, R.M. 2001. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* Montana State University.

Callaway, R.M. 2001. Soil microbes and *Centaurea* invasion. South African Association of Botanists Meeting, Grahamstown, South Africa.

Callaway, R.M. 2002. Competitors, microbes and biogeography affect *Centaurea* invasions. *Invited keynote symposium,* International Symposium on Evolution and Invasions, Halle, Germany.

Callaway, R.M. 2002. Insects and microbes as biological controls. *Invited symposium speaker.* Canadian Entomological Society, Winnepeg, Manitoba.

Callaway, R.M. 2002. Why is *Centaurea maculosa* a dominant in North America when it is a subordinate at home? Flathead Lake Biological Station.

Callaway, R.M. 2002. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* Colorado State University.

Callaway, R.M. 2002. Herbivory, mycorrhizae, and the invasive plant *Centaurea maculosa. Invited seminar.* University of Colorado.

Callaway, R.M. 2003. Mechanisms of invasion: soil microbes, root exudates, and competitors. *Invited seminar*. University of Chile, Santiago, Chile.

Callaway. R.M. 2003. *Centaurea* invasions: allelopathy, herbivory, and soil microbes. *Invited seminar*. University of California, Davis.

Callaway, R.M. 2003. Positive interactions and the structure of plant communities. *Invited seminar*. University of California, Davis.

Callaway. R.M. 2003. *Centaurea* invasions: allelopathy, herbivory, and soil microbes. *Invited seminar*. University of California, Santa Barbara.

Callaway. R.M. 2003. *Centaurea* invasions: allelopathy, herbivory, and soil microbes. *Invited seminar*. University of Houston.

Callaway. R.M. 2003. *Centaurea* invasions: allelopathy, herbivory, and soil microbes. *Invited seminar*. Rice University.

Callaway, R.M. 2003. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, Colorado State University. *Invited seminar*

Callaway, R.M. 2003. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, University of Pittsburgh. *Invited seminar*

Callaway, R.M. 2003. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, Providence University, Taiwan. *Invited seminar*

Callaway, R.M. 2003. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, Tunghai University, Taiwan. *Invited seminar*

Callaway, R.M. 2004. Allelopathy, soil microbes and the invasion of natural grasslands by spotted knapweed. *Invited seminar*. Symposium on Biological Invasions. Beijing, China.

Callaway, R.M., W.M. Ridenour, T. Laboski and G.C. Thelen. 2004. Allelopathy and the evolution of resistance to invasive plants. 89th Annual Meeting of the Ecological Society of America, Portland, Oregon.

Pearson, D.P., Y.K. Ortega, R.M. Callaway and K.S. McKelvey. 2004. Indirect effects of host-specific biological control agents. 89th Annual Meeting of the Ecological Society of America, Portland, Oregon.

Callaway, R.M. 2004. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, University of Vermont. *Invited seminar*

Callaway, R.M. 2004. *Centaurea* invasions: effects of herbivory, allelopathy, and soil microbes. Invited Seminar, Michigan State University. *Invited seminar*

Pearson, D.P. and R.M. Callaway. 2004. Indirect effects of biocontrols. USDA Biological Control Meeting, Denver, Colorado. *Invited seminar*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Iowa State University, Ames, Iowa. October 7, 2005. *Invited talk.*

Callaway, R.M. 2005. Herbivory and the response of exotic invaders. Symposium on plant responses to below ground herbivory. Reading, United Kingdom. October 23-25. *Invited presentation*.

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Purdue University, Lafayette, Indiana. October 7, 2005. *Invited seminar*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. University of California, Santa Barbara. December 12, 2005. *Invited seminar*

Callaway, R.M. 2005. Facilitation and climatic conditions. Symposium: Integrating species interactions with global climate change, Aberdeen, Scotland. January 7-11, 2005. *Invited seminar*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. University of California, Davis, CA. January 24, 2005. *Invited talk.*

Callaway, R.M. 2005. Soil biota and invasions: taking a biogeographic perspective. University of California, Davis, CA. January 26, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions: evolution of invaders and the invaded. University of California, Davis, CA. January, 28 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Georgia Tech University, Atlanta, Georgia. February 24, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Ohio University, Athens, Ohio. February 24, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Utah State University, Logan, Utah. March 10, 2005. *Invited talk.*

Callaway, R.M. 2005. Soil microbes and exotic invasions. Utah State University, Logan, Utah. March 11, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. University of Texas, Arlington. April 22, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. Duke University, Durham, North Carolina. April 7, 2005. *Invited talk.*

Callaway, R.M. 2005. Allelopathy and exotic invasions. Symposium on Plant Neurobiology, Florence, Italy. May 17-20, 2005. *Invited talk.*

Callaway, R.M. 2005. The role of allelopathy in exotic invasions. The International Botanical Congress, Vienna, Austria, July 17-23. *Keynote Address*

Reinhart, K.O. and Callaway, R.M. 2005. Soil microbes and exotic invasion: taking a biogeographical approach. The International Botanical Congress, Vienna, Austria, July 17-23. *Invited Symposium Presentation.*

Callaway, R.M. and J.M Vivanco. 2005. Invasion of plants into native communities using the underground information superhighway The International Allelopathy Symposium. *Keynote Address*. Wagga Wagga, Australia. August 22, 2005.

Callaway, R.M. 2005. Invasion Allelopathy and exotic plant invasion: from genes to communities: synopsis, updates, and implications. The International Allelopathy Symposium. *Grodzinsky Award Oration*. Wagga Wagga, Australia. August 23, 2005.

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. The University of Wisconsin, Eau Claire, September 15, 2005. *Invited talk*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. The University of Minnesota, Mankato, September 16, 2005. *Invited talk*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. The Institute of Ecosystem Studies, White Plains, New York. October 7, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. The University of Tennessee. October 7, 2005. *Invited talk.*

Callaway, R.M. 2005. Exotic invasions and the Novel Weapons Hypothesis. The University of Indiana. November 11, 2005. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. University of British Columbia. January 10, 2006. *Invited talk.*

Callaway, R.M. 2005. Evolution and exotic invasion. University of British Columbia. January 11, 2006. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. Archbold Biology Station. Florida. February 9, 2006. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. Halle University, Halle Germany. February 28, 2006. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. Lakehead University, Thunder Bay, Ontario, Canada. March 9. *Invited talk.*

Callaway, R.M. 2006. E Soil biota and invasions: a biogeographic perspective. Lakehead University, Thunder Bay, Ontario, Canada. March 10. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. University of Zurich, Zurich Switzerland, March 30. *Keynote presentation;* Swiss National Graduate Student Conference.

Callaway, R.M. 2006. Why is facilitation important? International Symposium on Facilitation, Madrid, Spain. June 22. *Keynote presentation.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. University of Nevada, Las Vegas. September 15. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. University of York, Toronto, Ontario. October 16. *Invited talk.*

Callaway, R.M. 2006. Exotic invasions and the Novel Weapons Hypothesis. Guelph University Guelph, Ontario. October 18. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of Idaho, Moscow, ID. January 17. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of Georgia, Athens, GA. February 27. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of New York at Stony Brook, Stony Brook, NY. March 14. *Invited talk.*

Callaway, R.M. 2007. The evolution of invaders: selection for competitive ability and defense against herbivores. University of New York at Stony Brook, Stony Brook, NY. March 15. *Invited talk. Slobodkin Award.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. Virginia Tech University, Blacksburg, Virginia. March 23. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. Cornell University Cornell, NY. April 4. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of California, Irvine, CA. April 13. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. Montana State University, Bozeman, MT. April 26. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of Amsterdam, The Netherlands. May 22. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. University of Nimegen, The Netherlands. May 23. *Invited talk.*

Callaway, R.M. 2007. Exotic invasions and the Novel Weapons Hypothesis. NIOO-KNAW Centre for Terrestrial Ecology, The Netherlands. May 24. *Invited talk.*

Callaway, R.M. 2008. Novel biochemistry and exotic plant invasions. Syracuse University. October 7. *Invited seminar.*

Callaway, R.M. 2008. Exotic plant invasions: how does a rare species at home become dominant away from home? Syracuse University. The Annual Jack and Pat Bryan Award. *Invited seminar.*

Callaway, R.M. 2008. *Centaurea* species, invasions, and novel biochemistry. International 5th International Weed Science Congress, Vancouver British Columbia, June. *Invited talk.*

Callaway, R.M. 2008. Conditional effects of an allelopathic root exudate: The toxicity of (±)-catechin is affected by interactions with different metals. Ecological Society of America Annual Meeting, August, Milwaukee, Wisconsin.

Callaway, R.M. 2008. Allelopathic effects of *Centaurea* species. International Allelopathy Society Meeting, Saratoga Springs, New York. *Invited talk.*

Pollock, J., W. Holben and R.M. Callaway. 2008. Conditionality in the allelopathic effects of *Centaurea maculosa*. International Allelopathy Society Meeting, Saratoga Springs, New York. *Invited talk.*

Callaway, R.M. 2008. Novel biochemistry and exotic plant invasions. University of Montreal. May. *Invited seminar.*

Callaway, R.M. 2008. Novel biochemistry and exotic plant invasions. University of California, Santa Cruz. April 9. *Invited seminar.*

Callaway, R.M. 2008. Novel weapons and exotic plant invasions. University of Alberta, March. *Invited seminar.*

Callaway, R.M. 2008. Novel weapons and exotic plant invasions. NSF workshop on ecology and biochemical interactions, Lima. Peru. May. *Keynote presentation*.

Callaway, R.M. 2008. Novel biochemistry and exotic plant invasions. Montana Tech University. November 30. *Invited seminar.*

Callaway, R.M. 2008. Novel biochemistry and exotic plant invasions. University of Illinois. October. *Invited seminar.*

Callaway, R.M. 2009. Facilitation in plant communities – the current state of play and future challenges. Annual British Ecological Society Symposium, Aberdeen, Scotland. January 20-22, 2009. *Keynote presentation*.

Callaway, R.M. 2009. Biochemical interactions in plant communities. Otago University, New Zealand. *Invited Seminar*.

Callaway, R.M. 2009. Does competition run the world? Positive interactions among plant species. Wichita State University, September 21, 2009. *Invited seminar.*

Callaway, R.M. 2009. Novel biochemistry and exotic plant invasions. Wichita State University, September 22, 2009. *Invited seminar. Watkins Visiting Professor.*

Callaway, R.M. 2009. Novel biochemistry and exotic plant invasions. Instituto Florestal de São Paulo, October 15, 2009. *Invited seminar.*

Callaway, R.M. 2009. Positive interations and interdependence in plant communities. University of São Paulo, October 17, 2009. *Invited seminar.*

Callaway, R.M. 2009. Novel biochemistry and exotic plant invasions. Universidad Autonoma, Mexico City, November 21, 2009. *Invited seminar.*

Callaway, R.M. 2009. Novel biochemistry and exotic plant invasions. University of Texas, San Antonio, December 16, 2009. *Invited seminar.*

Callaway, R.M. 2010. Positive interations and interdependence in plant communities. Ohio State University. January 21, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. Clemson University March 22, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. University of Arizona, March 29, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. Montana Tech University, Butte, April 22, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. Southern Denmark University, May 17, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. Tartu University, Estonia. May 20, 2010. *Invited seminar.*

Callaway, R.M. 2010. Positive interactions and interdependence in plant communities. Tartu University, Estonia. May 20, 2010. *Invited seminar.*

Callaway, R.M. 2010. Impacts of invaders in native and non-native ranges. Ecological Society of America, Pittsburgh, August 2010. *Invited session.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. University of Mississippi, September, 2010. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. University of Wyoming, September, 2010. *Invited seminar.*

Callaway, R.M. Positive interactions and interdependence in plant communities. University of Wyoming, September 2010. *Invited seminar.*

Callaway, R.M. Positive interactions and interdependence in plant communities. University of Kentucky, October 2010. *Invited seminar.*

Callaway, R.M. 2011. Positive interactions and interdependence in plant communities. China Agricultural University, October, 2011. *Invited seminar.*

Callaway, R.M. 2010. Novel biochemistry and exotic plant invasions. China Agricultural University, October, 2010. *Invited seminar*.
Callaway, R.M. 2010. The role of soil biota in exotic plant invasions. China Agricultural University, October, 2010. *Invited seminar*.
Callaway, R.M. 2010. The role of soil biota in exotic plant invasions. Sao Carlos University, December, 2010. *Invited Keynote.*
Callaway, R.M. 2011. Soil biota, plant interactions, and exotic plant invasion. The University of British Columbia Okanagan Campus, Kelowna, May 24-27, 2011. *Invited Keynote,* International Soil Ecology Meeting.
Callaway, R.M. 2011. Positive interactions and interdependence in plant communities. Freising, Germany. July, 2011. *Invited Keynote.*
Callaway, R.M. 2011. Novel biochemistry and exotic plant invasions. Black Hills University of South Dakota, September, 2011. *Invited seminar*.
Callaway, R.M. 2011. Soil biota and exotic plant invasions. International Rhizosphere Conference, Perth Australia, October, 2011. *Invited Keynote*.
Callaway, R.M. 2011. Positive interactions and interdependence in plant communities. Dartmouth University, October 2011. *Invited Seminar*.
Callaway, R.M. 2011. Novel biochemistry and exotic plant invasions. Texas A&M University, October, 2011. *Invited seminar*.
Callaway, R.M. 2011. Darwin versus Kropotkin: the nature of nature. *Provost's Lecture*, December, 2011The University of Montana.
Callaway, R.M. 2011. Montana Natural History Center, Helena. December, 2011. *Invited seminar*.
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. Dayton University, February 2012. *Invited seminar*.
Callaway, R.M. 2012. Positive interactions and interdependence in plant communities. UC Santa Barbara, February, 2011. *Invited Seminar.*
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. Duke University, March 2012. *Invited seminar*.
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. North Carolina State University, March 2012. *Invited seminar*.
Callaway, R.M. 2012. Restoration of mine tailing deposits. Montana Tech. April 2011, *Invited Seminar*.
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. Population Biology Conference, Zurich, Switzerland. *Invited seminar*.
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. University of Missouri October 2012. *Invited seminar*.
Callaway, R.M. 2012. Novel biochemistry and exotic plant invasions. University of Wisconsin, Milwaukee. October 2012. *Invited seminar*.
Callaway, R.M. 2013. Novel biochemistry and exotic plant invasions. Colorado State University April 2013. *Invited Distinguished Faculty Seminar*.
Callaway, R.M. 2013. Positive interactions and interdependence in plant communities. Colorado State University, April 2013. *Invited Distinguished Faculty Seminar.*
Callaway, R.M. 2013. What do blue oaks teach us about life? California Botanical Society. *Keynote Address*, April, 2013, Berkeley, CA.
Callaway, R.M. 2013. Positive interactions and interdependence in plant communities. International Association of Vegetation Science, Estonia, June 2013. *Opening Keynote Address*.
Callaway, R.M. 2013. Novel biochemistry and exotic plant invasions. University of Vigo, Spain. June 2013. *Invited seminar*.
Callaway, R.M. 2013. Novel biochemistry and exotic plant invasions. University of Coimbra, Portugal. June 2013. *Invited seminar*.

Awards

Fulbright Fellow, 2001-2002; Grodzinsky Award 2005, Allelopathy Society; University of Montana Distinguished Scholar 2006; Slobodkin Award 2007, Stony Brook University; William Evans Fellowship, Otago University, New Zealand, 2009; Watkins Visiting Professorship, Wichita State University 2009, AAAS Fellow 2010; Paul Lauren Undergraduate Mentor Award, 2013.