

## **Interdisciplinary Seminar Series: Increasing Awareness for Research, Recognition of the University, and Professional Development Opportunities**

### **Dr. Jamie J Newman, Louisiana Tech University**

Dr. Jamie Newman is an Assistant Professor in Biological Sciences at Louisiana Tech University. Dr. Newman completed her BA in Biology at Amherst College and her PhD in Biology at MIT. Dr. Newman's research focuses on understanding mechanisms that regulate cell state using stem cells as a model for studying cell behavior. In addition to the lab's focus on basic biology, the use of stem cells has led to collaborations across campus where stem cells are being used for research into areas of tissue engineering. Dr. Newman is the founder of the New Frontiers in Biomedical Research Seminar Series and continues to lead the organization of the series each year.

### **Dr. Mary E Caldorera-Moore, Louisiana Tech University**

Dr. Mary Caldorera-Moore is an assistant professor of Biomedical Engineering and Nanosystems Engineering, director of Women Influencing Science, Technology, Engineering, and Math (WiSTEM) outreach organization, and the co-organizer of the New Frontiers in Biomedical Research Seminar Series at Louisiana Tech University. She was also selected to be a 2014 NAE Frontiers of Engineering Education (FOEE) Early-Career Engineering Faculty Member. She has a strong background in the development and synthesis of response-sensitive biomaterials, polymeric hydrogels, drug delivery systems for "engineering better medicines." Dr. Mary Caldorera-Moore is a well-qualified researcher who has conducted research in the biomedical field for 12 years. Throughout her academic career, Dr. Caldorera-Moore has been exceedingly active and dedicated to mentoring students.

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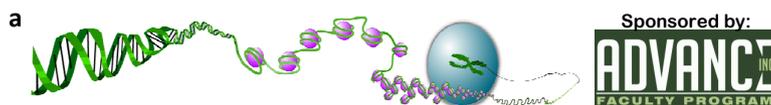
### History and Vision of Seminar Series

In the rapidly changing and growing field of biomedical research, it can be extremely difficult to stay informed and connected to other researchers, especially for students and researchers at small to medium-sized universities in rural areas. Being the only nationally-ranked university within a 200 mile radius –Louisiana Tech University is the most geographically isolated of any ranked public school in the eastern United States- the ability to stay connected to others in a given research field requires an even greater effort. Moreover, this isolation means we are one of the only resources in the region advocating for STEM careers and higher education. One approach to increase faculty, student, and community exposure to cutting edge research and promote STEM education is the development of a seminar series that brings nationally and internationally recognized leaders in biomedical research to them. From this notion, The New Frontiers in Biomedical Research Seminar Series was created. Given that the NSF “ADVANCE projects support institutional transformation in STEM,” support for the seminars was granted from Louisiana Tech’s program and quickly garnered support from the University and community, increasing local exposure to biomedical research and increasing exposure of the University across the country.

Specifically, the goals of the New Frontiers in Biomedical Research Seminar Series and the vision shared by those involved include:

- Introducing the Louisiana Tech University to visiting faculty through interactions with students, faculty, and administrators, including the University Vice President of Research and Development and the University President
- Introducing faculty to visiting faculty to encourage collaboration
- Showcasing and promoting interdisciplinary research
- Showcasing the University’s research centers, teaching initiatives, facilities, and faculty to visiting seminar speakers.
- Providing examples for students of oral presentation and communication skills
- Providing an opportunity for students to network with visiting faculty
- Engaging the community in learning about biomedical research across the country and at the University

The Seminar Series began with an ADVANCE Networking grant for \$1,570 awarded to two female faculty members active in the ADVANCE program in the fall of 2012 as a way for then, part-time Research Assistant Professor Dr. Jamie Newman (Co-PI on the proposal), to meet people in her state with similar research interests. The funds were awarded as part of a series of networking mini-grants available through the University’s NSF ADVANCE grant awarded in 2009. The University’s ADVANCE project began with a goal of building a more



## Stem Cells & Biomedical Research Seminar Series

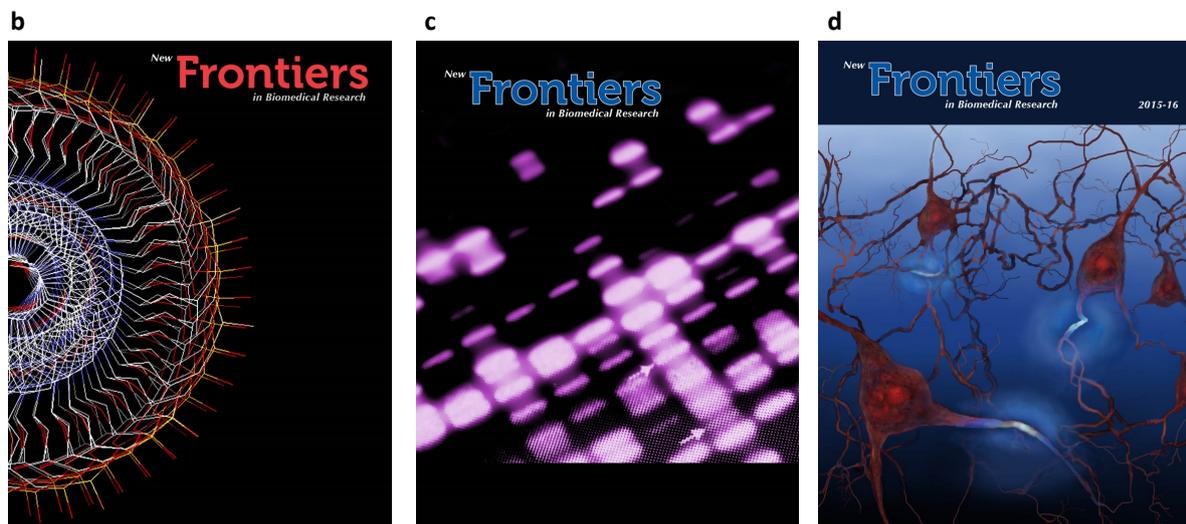


Figure 1. Flyer and brochures from the first four years of the Seminar Series. (a) 2012-2013 was a simple word document flyer, (b) 2013-2014 had an image of DNA generated by a faculty member and student, (c) 2014-2015 was a purchased image, (d) 2015-2016 was illustrated by an art professor at the University who will oversee future covers created by students and faculty.

supportive climate, enhancing promotion and leadership, and increasing retention of women faculty in STEM. Support for a seminar series that would increase faculties' networking opportunities and allow a young female to take on a leadership role in the organization of the series was in line with the program's mission. That first year, seminars were advertised with paper fliers in the buildings (Figure 1), speakers received little more than travel reimbursement, and 20-30 people attended seminars. Despite financial constraints, the seminar was successful and Newman did meet a number of researchers from other universities in her state that she continues to see at meetings and keeps in touch with. In addition, that following fall Dr. Newman received a full time tenure track faculty position in the University's Biological Sciences department.

In a press release submitted at the end of the first year-long series, the Co-PI Dr. Jamie Newman, assistant professor of Biological Sciences noted that "We were able to involve students, faculty, staff, and the community, with many attendees saying that it introduced them to new topics in science and research. One undergraduate who attended most of the seminars commented on how the series provided a 'family-feel with faculty, students, and speaker' coming together over a shared interest." The fact that students were able to benefit so much from the experience, getting a chance to meet the speakers individually and learn about other areas of research in their field, clearly impacted the success of the series. Others

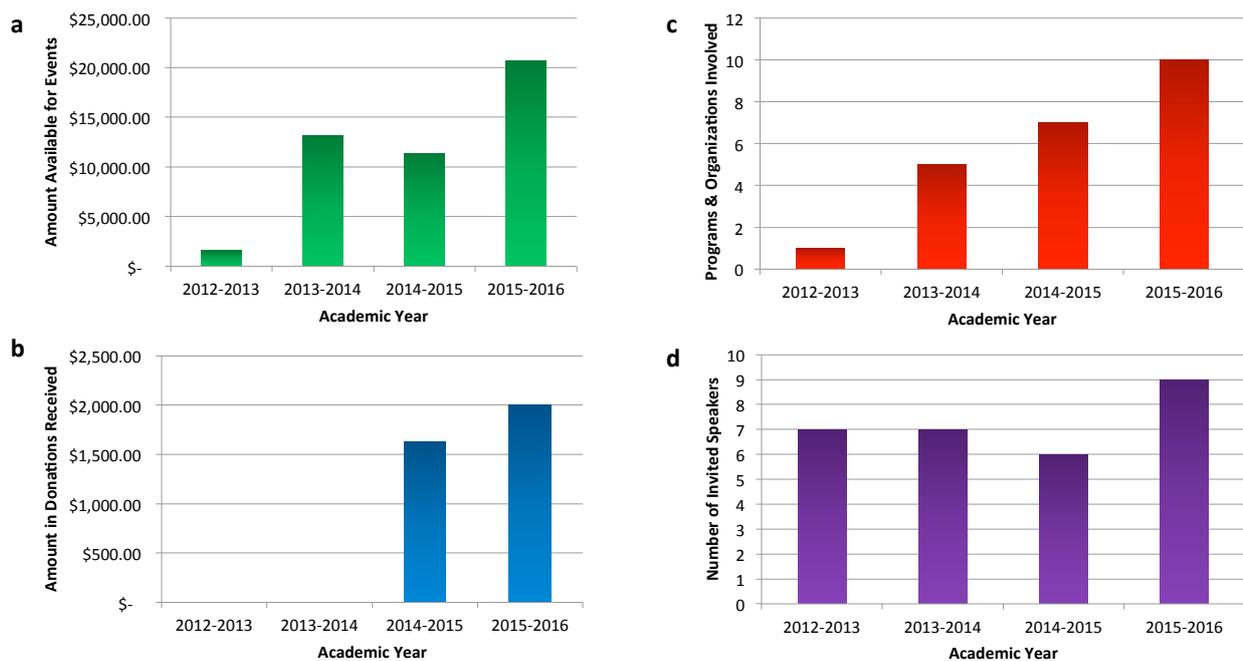


Figure 2. Statistics demonstrating an increase in (a) funding availability, (b) donations received, (c) campus programs and organizations involved, and (d) the number of speakers hosted as part of the series over the past 4 years.

across campus recognized this success and the following year several programs on campus approached the organizers to get involved in creating a broader series that addressed the interdisciplinary nature of biomedical research.

With the growth of the series, the number of people involved and impacted grew too. One of the unique features of this series is that it involves four of the five colleges at Louisiana Tech with at least 10 individual programs participating, creating a truly interdisciplinary seminar series. Over the last three years, faculty and students from biomedical engineering, biology, kinesiology, and chemistry have been polled for seminar speaker recommendations. In turn, those faculty members have been involved in the planning and hosting of their recommended speaker. Since people invite speakers they would benefit from meeting (potential collaborators, manuscript and grant reviewers, letters of support), this is an invaluable opportunity for faculty to have one-on-one time with significant researchers in their field. Given the cost of conferences, which makes it hard for faculty, and especially students, to travel, in many ways the New Frontiers Seminar Series is a means to give faculty and students similar opportunities that a conference gives them but in a more intimate environment. With each guest costing the series ~\$1200-1500 which includes travel, accommodations, meals, and an honorarium, many more people are impacted by the Seminar Series each year than could travel to a conference for that same amount of money. The involvement of various departments and administration along with the types of events organized for each speaker's visit strive to build a culture of integrating research and education, something that is cited as being critical to the maintenance of higher education [1].

In addition to the faculty and student benefits from the New Frontiers in Biomedical Research Seminar Series, Louisiana Tech also gets a chance to showcase their resources and accomplishments to nationally and internationally recognized research leaders. Brochures are mailed out to over a 100 Biomedical Engineering programs across the country to advertise the events and promote our programs to other universities. Along with this brochure we send a letter with information about our website and a link to the recorded seminars. For each of our visitors on campus, we also put together a packet of information that includes information on our undergraduate and graduate programs for them to share with their colleagues and students. All previous seminar speakers have given positive feedback about the seminar organizers, the faculty, facilities, and the University, highlighting the on-campus accommodations in the former President’s house and the fact that nearly all of them spend at least 30 minutes with the University President. Taken together, these efforts make other universities aware of our activities and programs at Louisiana Tech.

The continued positive outcomes of the series for all involved have led to significant increases in funding support. As depicted in Figure 2, following that first year, the funding increased from \$1,570 to \$13,130 and included funding from one program on campus to four campus programs, funding from the Office of the University President, a professional organization, and a non-profit community organization.

### Networking and Professional Development: Education and Opportunities

The goals of the NSF ADVANCE program include “development of systemic approaches to increase the representation and advancement of women in academic STEM careers and to contribute to the development of a more diverse science and engineering workforce.” Within the context of the ADVANCE program objectives, the New Frontiers in Biomedical Research Seminar Series has created a platform for engaging a diverse group of students, faculty, and the surrounding community in learning about and discussing biomedical research. The seminars do not only expose the local citizens to research but have also created a venue for people interested

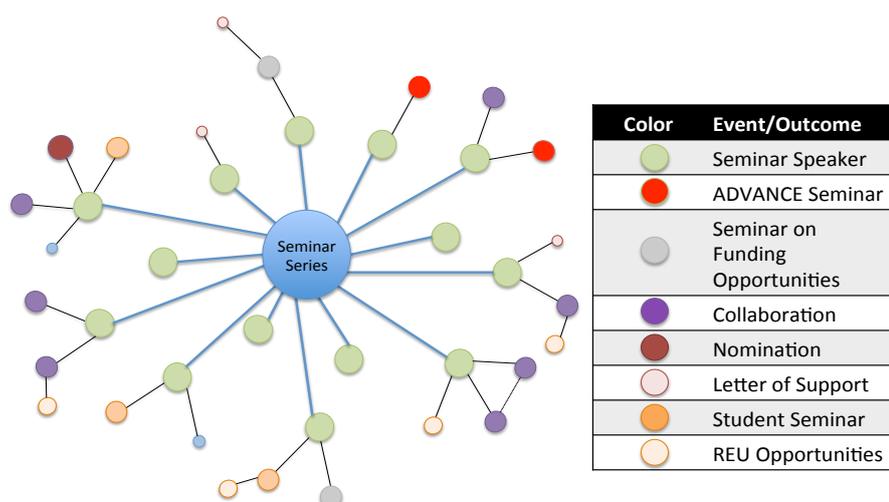


Figure 3. Networking diagram depicting events and outcomes for all invited speakers who have come to Louisiana Tech to date. Size of circle indicates assessed impact.

in the STEM fields to come network and discuss science.

Interaction and communication between colleagues and professionals is one of the most important aspects of career development and advancing scientific research. The New Frontiers in Biomedical Research Seminar Series strives to provide opportunities for networking with the invited guest, as well as teaching students how to network and the value of such interactions. To achieve these goals, all guests meet with several faculty and administrators during their visit, both over meals and in one-on-one meetings. This allows faculty to share their research with the guests, engage in conversations about education and degree programs, and promote students who may want to work with one of the guests in the future, all helping to build a memorable relationship between the guest and members of the University faculty. As a result of these meetings there are currently at least 7 on-going collaborations between invited guests and Louisiana Tech faculty (Figure 3). In addition, most speakers are scheduled to spend one hour meeting with students in an informal, student-only venue so that students can feel comfortable asking questions and engaging in conversation with the guest speaker. The seminars themselves serve as an opportunity for those in attendance to learn about an area of science they may not be familiar with. Studies show that “informal science learning” may be more effective than traditional classroom lectures because students had the choice to attend and may feel more invested in the information [2]. Therefore, these events serve as a novel educational opportunity that may have a greater impact on students than the standard lectures they hear in class. Finally, following each of the seminars there is an open reception where anyone who attended the talk can visit with other attendees and the seminar speaker themselves to ask questions, share ideas, and share contact information for future opportunities (detailed schedule template in Figure 4). Figure 3 gives an overview of all events and outcomes that have resulted from the series to date and Table 1 outlines some of the more significant outcomes of the networking events.

In some cases, it has been appropriate to organize a workshop specifically devoted to Networking and Professional Development because of the individual speaker’s background. Examples of these events included a speaker in the 2013-2014 series holding a workshop for female graduate students and faculty on peer mentoring. The University President also attended this event, demonstrating his own support of these opportunities. From that workshop there is at least one official peer mentoring group the organizers know of on campus, but likely there are other, more informal groups helping to support female professional development. A second workshop in the 2015-2016 series, again geared towards female graduate students and faculty, focused on balancing productivity as a research faculty member. The speaker shared her own experiences as a tenure-track research faculty member at a Tier 1 research university and created a comfortable environment for questions and discussion. Finally, a speaker in the 2015-2016 series held a workshop for women in science in partnership with Louisiana Tech’s Advocates and Allies program, a program started during the ADVANCEing funding period for “male faculty interested in supporting women faculty members in departments, colleges, and the university...[who are] expected to be active proponents of gender diversity and equality.”[3] This has been one of the few opportunities

where both male and female faculty members are together to discuss issues facing women in academia and how things have changed over the years and can continue to change. As the series continues, more events will be cosponsored by Office for Women in Science and Engineering (OWISE) and Advocates and Allies to engage more of the Louisiana Tech community in learning about career and professional development. All of these workshops have had 15-20 participants and been positively received by all of those who have attended as is suggested by continued support for such events.

Speaker Name Speaker affiliation and contact information		Series Name and Specific Lecture Sponsor	
<b>Sunday</b>			
Time	Event	People/Persons Attending	Location
TBD	Arrival Ruston	Host or Organizer	Pick up from airport
6:00 pm	Dinner	Faculty Organizers Funding Organization Representatives	Sponsored dinner at local country club
<b>Monday</b>			
Time	Event	Faculty	Location
7:30-7:45 am	Pick up from House	Faculty	
8:00-8:30 am TENTATIVE	Faculty Meeting	University President	President's Office
8:45-10:00 am	Faculty Meeting	Workshop	
10:15-11:00 am	Faculty Meeting	One-on-one meeting	
11:00-11:30 am	Faculty Meeting	One-on-one meeting	
11:30-12:00	Faculty Meeting	One-on-one meeting	
12-1:00 pm	Lunch	Faculty Administrators	Campus Faculty Dining Room
1:00-2:00 pm	Tour	Tour of relevant facilities led by faculty member	
2:00-2:45 pm		Faculty meetings, student meetings, or lab meetings	
3:00-3:30 pm	Set up for seminar	Assisted by host and organizers	
3:30-4:30	Seminar		
4:30-5:30 pm	Reception		
6:00 pm	Dinner	Faculty and students	Restaurant in town
<b>Tuesday</b>			
Time	Event	Faculty	Location
8:00-8:45	Coffee	Faculty members	
TBD	Departure	Host or Organizer	Drive to airport

Figure 4. Template of schedule used for planning visit of guest speaker.

## Community

One of the goals for the New Frontiers in Biomedical Research Seminar Series was to introduce and highlight Louisiana Tech's research programs and expertise to the local community. The University is located in a small community of ~22,000 people that centers on the University. Being the only nationally-ranked university within a 200 mile radius it is important that it serve as a resource and educate members of the community on scientific advances and educational opportunities. To that end, all seminars are open to the public, advertised in the local paper, and there are at least 1 or 2 seminars each year that are designed specifically for a more general audience. In addition, all seminars are recorded (with permission from the speaker) and made available through various links on Louisiana Tech's websites and the Seminar Series website, facebook, and twitter feeds.

The Series has also acquired support from a local non-profit organization, Lincoln Health Foundation (LHF), that seeks to improve health outcomes for members of the community. The sponsored lectures have focused on issues that affect the community at rates above the national average. To date, these topics have included cancer, diabetes, obesity, and cardiovascular disease. Originally these events began with evening lectures for the community given by the guest speaker. These seminars unfortunately did not reach many people and not always the intended general audience from the community. In the spring of 2016 the series is pairing up with several departments across campus including Kinesiology,

Nursing, and Human Ecology to enhance these events. This year, children from the local Boys and Girls Club were brought to campus to participate in interactive stations focused on living a healthy life and making healthy choices. When the parents arrive to pick up their children, they spend 15-20 minutes with the invited speaker, learning about what they can do to promote the health of their families. The support these events have garnered from departments across campus speaks to the success of the series, the impact it has had so far on the Louisiana Tech community, and the common goal of those at the University to impact their community.

### Future of Seminar Series

The Seminar Series has brought recognition to Louisiana Tech University, built professional networks for students and faculty, engaged the local community in the University, and introduced students to a broad range of topics in biomedical research from engineering, chemistry, physics, translational medicine, basic biology, sports medicine, and even the arts. The seminar series to date has served as a model at the University for creating a regular dialog among students and faculty on the topic of biomedical research and spurred the generation of weekly seminars in a variety of other departments across campus. From the foundation of the series, the organization of these events has allowed the current organizers, two tenure-track female professors, to take on a leadership role, promote their research within the University and with the guest speakers, build their professional network, and encourage their interactions with faculty across disciplines along with University administrators. The University President, Dr. Les Guice, echoes these sentiments saying that “perhaps the most beneficial impact to our University has been the opportunity it has provided for our young faculty, particularly women in STEM, to make significant contributions to our research programs and to give them leadership opportunities that can be crucial to advancement in their profession.”

As the series has grown, Newman and Caldorera-Moore have been approached by faculty across campus to become a part of the series and host a speaker as part of the year-long event. This has increased the interdisciplinary nature of the program and given other faculty, both male and female, the opportunity to have similar experiences and opportunities for their own professional development. The University Vice President for Research and Development, Dr. Stan Napper, commented that while most seminar series on this campus and others “tend to be program focused (one academic department) or research center focused... (The Seminar Series) has achieved a truly interdisciplinary goal with wide campus impact [aided by] the uniqueness of the organizing committee (untenured faculty, from different colleges).”

As the series continues, the organizers will focus more on assessment and better meeting the needs of the faculty and students involved by bringing in people from industry and other careers in the biomedical sciences. One avenue the organizers have pursued is a collaboration between arts and sciences where medical illustration is promoted and images are generated for use in the seminar series and other instructional materials and publications. medical illustrators are trained not only in the arts, but have a biology or medical

degree that allows them to render detailed and accurate depictions of biological processes and anatomy. The collaboration that started as a final project where students competed for the cover of next year's seminar series brochure culminated in an art exhibit and auction that raised over \$5,000 for the continuation of the course and the promotion of students in to the field of medical illustration.

The impact of all of these events to date is best summarized by the PI of Louisiana Tech's NSF ADVANCE grant, Dr. Jenna Carpenter, when she states that "the success of the speaker series really exceeded our expectations, but it is a great example of how providing women faculty with some small seed funding to get a great idea off the ground can have a profound impact on the entire university and community. Dr. Newman and Dr. Caldorera-Moore took advantage of the opportunity to boost and enhance their own careers and reputations, as well as those of the larger research centers, faculty, students, university and community through inviting and establishing relationships with top researchers across the country. It is precisely this type of success that ADVANCE grants like ours are designed to foster. Supporting the success of women faculty increases the success of us all. We are thrilled to have been one of the catalysts of this effort." It is the hope that the events that have been created will serve as a model for students, new faculty, and other universities to pursue their passion, collaborate with colleagues across departments, and engage with the community to create a rich, dynamic, and energizing academic culture.

#### References:

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2. AbiGhannam, N., L. Kahlor, A. Dudo, M.-C. Liang, S. Rosenthal, and J.L. Banner, *Expectancies and Motivations to Attend an Informal Science Lecture Series*. International Journal of Science Education, Part B, 2015: p. 1-24.
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