This report provides summaries of Physiologists in Industry (PIC) activities during 2016-2017. The committee has one action item:

**Action Item: The Committee proposes changing the name of the PIC Award from “Novel Disease Model Award” to “Translational Research Award.”**

**Rationale:** The term “novel disease” has limited the number of applicants who apply for the award and also has limited interest in providing funding for the award. In an effort to increase the number of applications and reach a wider group of potential applicants as well as to broaden the potential funder base, the Committee proposes changing the name of the PIC Award from “Novel Disease Model” to “Translational Research Award.” This broadens the award focus to include more areas of research that is translatable to industry applications (e.g., treatment development or improvement, diagnosis, mechanism of action, health & wellness, etc.). The committee will work with staff to make needed revisions to the award promotions and application process.

### A. EB2017 PIC Symposium

**Background:** PIC sponsors an EB symposium each year, focusing on translational research. The 2017 symposium, entitled "Nitric Oxide Pathway Modulation for Therapeutic Intervention and Exercise Enhancement" was organized and chaired by John Mattson, Ph.D. and Co-chaired by Kavaljit Chhabra, Ph.D. (Post-doctoral recipient of 2016 PIC Novel Disease Award). The session abstract is provided below.

**Abstract:** Nitric oxide (NO) vasodilatory properties have been utilized as a medical intervention for more than 130 years through the use of nitroglycerine. However, it wasn’t until the discovery that endothelium-derived relaxing factor was in fact NO in the late 20th century that laboratories sought to augment its properties for physiological benefit. NO is produced endogenously by the reduction of L-arginine to L-citrulline via three distinct nitric oxide synthase (NOS) isoforms: endothelial NOS (eNOS), neuronal NOS (nNOS), and inducible NOS (iNOS). Specifically, NO acts via soluble guanylate cyclase (sGC), which catalyzes the production of cyclic guanosine monophosphate (cGMP), to function as a messenger in vascular, inflammatory, cell proliferative, tissue fibrotic, and metabolic control. In addition, dietary inorganic nitrate (NO3) delivered, for example, via ingested beetroot juice can be reduced to nitrite (NO2) and, subsequently, NO and other reactive nitrogen intermediates and impact haemodynamic and muscle metabolic function. Conversely, NO signaling dysfunction is associated with several risk factors for cardiopulmonary diseases (e.g., cardiovascular disease, pulmonary hypertension). Alternatively, dietary NO3 ingestion via sodium NO3 salt reduces blood pressure, lowers submaximal exercise oxygen uptake (VO2) and has been demonstrated to enhance exercise tolerance. This symposium will explore recently discovered therapeutic compounds and nutritional supplementation as a way to enhance NO pathway signaling in health and disease. Specifically, Bayer scientists will present the discovery and development of first-in-class novel sGC modulators and academic cardiovascular physiologists will explore key models and strategies for understanding NO function in the cardiovascular system and current evidence for how vascular, muscle and exercise performance may be enhanced.
Update/Outcome: The symposium was held on Sunday, April 23 at 10:30 am–12:30 pm in the Chicago Convention Center, Room W192B. All scheduled speakers were able to present. Feedback from PIC attendees as well as others indicates that all of the topics were very well-received. Attendance was excellent with more than 300 attending. The session was cosponsored with the EEP section, which helped with promotion. Dr. Mattson has since been invited by the Editor in Chief of the Journal of Applied Physiology to submit the symposium as an invited manuscript.

Abstract: To celebrate the 30th anniversary of the discovery of endogenous NO, this review will highlight the diverse scientific discoveries academic laboratories and a pharmaceutical company have undertaken to evaluate therapeutic compounds and nutritional supplementation as a way to enhance NO pathway signaling in health and disease. Specifically, two industry scientists will present the discovery and development of first in-class novel sGC modulators for treatment of cardiopulmonary diseases and beyond and two academic physiologists will explore key models and strategies for understanding NO function in the cardiovascular system and current evidence for how vascular, muscle and exercise performance may be enhanced through this pathway.

B. EB2017 Novel Disease Awards

Background: The PIC Novel Disease Model Awards a postdoctoral and a doctoral student award. This award recognizes a trainee whose investigation in a novel disease model has been designated by the Physiologists in Industry Committee as an outstanding example of experimental research. While the model may be cellular or in vivo, the applicant must clearly emphasize the novelty of the model and the potential utility of the system for future research related to a disease process. Applicants do not have to be APS members and there are no restrictions on how the award is spent. Awardees can only receive the Novel Disease Model Award once as a postdoctoral fellow and once as a predoctoral student. Awardees are recognized at the APS Business Meeting. The award is $500 for the pre-doctoral student and $800 for the post-doctoral fellow.

Update/Outcome: Committee received a total of 18 applications (9 predoctoral and 9 postdoctoral applicants). Each application was reviewed and scored by 11 PIC committee members. The winner of the postdoctoral award was Dr. T. Dylan Olver, University of Missouri, Columbia, for the project entitled “Elucidating the Mechanisms of Pial and Paraenchymal Cerebral Small Vessel Disease in a Novel Porcine Model of HFpEF”. The winner of the predoctoral award was Ms. Kasi McPherson, University of Mississippi Medical Center, for the project entitled “Treatment with Lisinopril Delays the Early Progression of Proteinuria in a Novel Model of Prepubertal Obesity”. Eugene W. Shek, Ph.D., past PIC Chair presented the two Awards at the APS Business Meeting for Matthew R. Zahner who was unable to attend.

Action Item: The Committee proposes changing the name of the PIC Award from “Novel Disease Model Award” to “Translational Research Award.”

- Rationale: The term “novel disease” has limited the number of applicants who apply for the award and also has limited interest in providing funding for the award. In an effort to increase the number of applications and reach a wider group of potential applicants as well as to broaden the potential funder base, the Committee proposes changing the name of the PIC Award from “Novel Disease Model” to “Translational Research Award. This broadens the award focus to include more areas of research that is translatable to industry applications (e.g., treatment development or improvement, diagnosis, mechanism of action, health & wellness, etc.). The committee will work with staff to make needed revisions to the award promotions and application process.
**Funding:** The committee discussed obtaining a new PIC Symposium Sponsor. Dr. Shek discussed possible funding of the award to honor PIC member Shaila Basavappa who passed away this year. He will work with APS staff in the Education and Development Offices on this effort.

**D. EB2017 PIC Business Meeting**

**Background:** PIC schedules a business meeting held at EB each year.

**Update/Outcome:** This year’s meeting was held on Sunday, April 23, 2:30 - 4:00 pm in the San Diego Marriott Marquis & Marina, Carlsbad Room. Dr. Shek chaired the meeting. At the meeting, the following items were discussed.

- Committee would like to request same scheduling for the 2017 symposium on Sunday 10:30 am to 12:30 pm at the June 2018 JPC meeting and a room to accommodate 300+ attendees.
- The committee discussed possible topics and general parameters of future symposia. For example, they decided it was better to focus on issues of broader interest such as emerging technology and its contribution to research.
- 2018 symposia topic: Biosensors in health and disease. Possible talks may include:
  a. Continuous glucose monitoring (metabolic applications)
  b. Environmental/energy/thermoregulation monitoring (military applications)
  c. Cardio/neuronal monitoring
- Committee discussed ways to and identify active roles improve the participation of co-chair postdoctoral PIC awardee.
- The committee discussed the award presentation to be made at the APS Business Meeting on Tuesday. (Dr. Shek will present the awards for Dr. Zahner).
- Committee agrees to continue to invite the postdoctoral award winner to co-chair the 2017 PIC symposium as well as to invite both predoctoral and postdoctoral recipients to attend PIC Mixer.
- Committee also wants to continue to enhance communication with trainees regarding industry internships opportunities via web-links on the PIC and APS websites and through APS listservs and social media. Dr. Matyas reported that the list of summer internships that were provided by PIC members in previous years is on the APS website (see [http://www.theaps.org/mm/Education/GraduateProfessional/Postdoctoral-AwardsFellowships/Industry-Internships-and-Fellowships](http://www.theaps.org/mm/Education/GraduateProfessional/Postdoctoral-AwardsFellowships/Industry-Internships-and-Fellowships)). Matyas will ask the new Higher Ed Program Coordinator to redo the survey of industry members and update the list of internships and fellowships in 2017-2018.
- Committee welcomes the following PIC representatives:
  - Lynn Cialdella Kam (Teaching)
  - Stefano Gaburro (CNS)
  - James Garnett (Cell & Molecular)
  - Romer Gonzalez Villalobos (Renal)
  - Carrie Northcott (WEH)
- A PIC teleconference is being scheduled for August 2017 to discuss the PIC symposium, the PIC Award, and other action items from the business meeting.
C. EB2017 PIC Mixer

**Background:** The Annual Physiologists in Industry Committee Mixer is traditionally a great opportunity to network with industry and academic APS members alike. The mixer is designed to attract trainees and engage them in discussion about careers, research, and opportunities in industry positions.

**Update/Outcome:** The 15th annual PIC mixer was held on Sunday, April 23, 6:45 - 8:00 pm in room Grant Park A of the Hyatt Regency McCormick Place. The mixer attracted individuals across all levels of training. This year we included a cash bar and free hors d’oeuvres. The mixer was well attended and provided a great chance for meaningful industry career opportunity discussions. Trainees received good feedback from attendees.

E. EB2018 PIC Symposium

In order to foster greater interaction among sections, academia, and industry, the 2018 PIC symposium will focus on basic sciences topics with preclinical stages of development and translation that has broad appeal to cross sectional APS members. The title of 2018 PIC symposium is “**Biosensors Advancing Health and Disease Research**”. The session will be coordinated and chaired by Brandon Bucher and co-chaired by T Dylan Olver, Ph.D. Mr. Boucher is an active member of the committee and Dr. Olver is our 2017 Novel Disease Model Award recipient at the postdoctoral level. The session abstract is provided below.

**Abstract:** Innovation in biosensor technology plays a vital role in removing the barriers to advancement in health and disease research. Novel ideas and concepts must often wait for step changes in technology to make answering important questions possible. These technologies can allow scientists access to new sources of data, improving the quality and clarity of data, better support a new experimental protocol, or increase subject welfare. This symposium explores three new technologies in life science research, exploring how they have been used to produce better results in health research, leading potentially to better outcomes for patients.

Continuous glucose monitoring implants have improved the quality and time resolution of glucose tolerance and homeostasis. The ability to acquire a more complete data set removes barriers to better understanding dynamic affects of glucose changes when compared to traditional blood sampling. These improvements in data allow smaller sample sizes, and more humane treatment of laboratory animals. These devices have been improving outcomes in research applications such as diabetes, nutrition, obesity and metabolism research.

**JPC Representative:** Matthew Zahner Ph.D. will serve as PIC representative to the JPC and will attend the June 2017 meeting.
F. Summary and Conclusions
PIC continues to support the efforts of APS with the initiatives discussed above. We have a committee that is active in PIC/APS, many with new, fresh ideas that will help further strengthen the PIC/APS relationship, and help maturing physiologists understand how industry can contribute to better physiology-based science.

I would like to thank Council for their generous support, especially for the oversight of Marsha Lakes Matyas and her staff in the APS Education Office. It is was a great pleasure for me to serve as the Cardiovascular Section representative for the past 3 years and it is a great honor for me to be selected to now serve as the PIC Chair. I look forward to continuing to serve and support APS visions, goals and missions in future.

Respectfully submitted,

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