Empowering discovery to improve health

American Physiological Society

2017 ANNUAL REPORT
Physiology

Through the study of how and why the body works, physiologists help us understand the underpinnings of disease. Swedish chemist and inventor Alfred Nobel recognized the outstanding contributions of physiology to bettering humanity when he included “Physiology or Medicine” among his endowed annual prizes.

Louis Ignarro, PhD, who received the 1998 Nobel Prize in Physiology or Medicine for discovering the important role of nitric oxide in the cardiovascular system, gave the Nobel Prize lecture at EB2017.
ABOUT APS
The American Physiological Society (APS) is an essential driving force behind the discipline of physiology and its contributions to scientific discovery and humanity. The Society’s mission is to advance scientific discovery, understand life and improve health.

Founded in 1887, APS is one of the oldest professional scientific societies in the U.S. The Society currently has approximately 11,000 members holding doctoral and/or professional degrees in physiology and/or medicine. APS publishes 15 research journals, organizes several scientific meetings and conferences, offers numerous career development and research awards, advocates for sound science policy and research funding and supports extensive educational programs in the biomedical and biological sciences.
Reflections on 2017: Development of a New Strategic Plan

Thank you to our committee members, staff and leadership for their dedication and support of the Society’s numerous meetings, programs and awards in 2017. I also extend my sincere appreciation to all of our members, donors and sponsors, without whom we could not provide the vast majority of our programs and awards.

Importantly, this past year, the Society’s leadership and senior staff worked with an external advisory company, Minding Your Business (MYB), to devise a new strategic plan to guide APS over the next few years. In February, members of the APS Council, Section Advisory Committee, Trainee Advisory Committee and senior APS staff met with MYB for a three-day planning session during which they identified five new strategic pillars:

- Refreshing the focus of the Society
- Modernizing the membership model
- Prioritizing and evaluating Society offerings
- Extending the influence of the Society through journals and conferences, and
- Enhancing governance and operational performance

As part of the strategic planning process, we devised new mission and vision statements and prioritized our core audiences. We decided to temporarily suspend new initiatives while we further define our priorities and develop evaluative measures for existing and new programs and initiatives. The APS leadership also set up several task forces to evaluate current Society offerings and make recommendations as to which programs should be unchanged, modified or discontinued and to what extent resources should be devoted to each. Final recommendations from these task forces will be presented at the spring 2018 Council meeting in San Diego and will be instrumental in determining programmatic changes that APS will implement over the next few years.

I have really enjoyed my term as APS president during this time of exciting and positive change within the Society. I am certain that the next president, Jeff Sands, will continue this process of improving our commitment and relevance to APS members in 2018 by leading the implementation of key components of the strategic plan. Finally, we have initiated the search for a new executive director to replace Martin Frank as he heads on to retirement after 30+ years at APS. On behalf of all of us, I would like to offer my sincere gratitude to Marty for all that he has done over his long leadership tenure. APS will not be the same without him.

Sincerely,

Dennis Brown, PhD, FAPS
90th APS President
On My Retirement: Reflections on 33 Years of Service

I have had the pleasure of serving as APS executive director since 1985, working with the Society’s volunteer leadership, membership and outstanding staff to advance the Society and the discipline of physiology. It is hard for me to believe that I have almost reached 35 years of service to the Society. Unfortunately, I will not reach that milestone since it is my intention to retire effective June 30, 2018. Although this was a difficult decision to make, I know that this will be a good transition for APS. A new executive director will bring fresh perspectives and help the Society move forward as I did starting in 1985.

When I arrived in 1985, the programs of the Society were not as expansive as they are at present. During my tenure, the Society has grown from 6,000 to over 11,000 members. We now have 80 staff members and have added numerous programs that have greatly benefited the physiology community. I feel the greatest pride in having helped to foster the Society’s commitment to diversity.

When I started in 1985, APS had a graduate research fellowship for underrepresented minority students. During my tenure, the Society greatly expanded efforts to support underrepresented minorities through meeting travel awards for trainees, K–12 teacher summer research fellowships and undergraduate summer research fellowships. These programs have fostered a strong and growing community of underrepresented physiologists in APS. Other accomplishments during my tenure at APS include building a strong advocacy program for animal research, moving all APS journals online and developing an undergraduate research program that attracts students to physiology research careers. I do hope all will think of these programs, in particular the diversity programs, as part of my legacy at APS.

It has been an honor working with each of you to advance the Society and physiology.

Sincerely,

Martin Frank, PhD, FAPS
APS Executive Director (1985–2018)
APS is a community that champions the discipline of physiology. APS has 11,049 members worldwide.

- **25%** of APS members are international.
- **21%** of APS members are trainees.

### Distribution by Region

- **United States**: 74%
- **Europe**: 9.1%
- **Asia**: 6.1%
- **Canada**: 5.2%
- **South America**: 2.4%
- **Oceania**: 2.1%
- **Africa**: 0.4%
- **Mexico**: 0.4%
- **Caribbean**: 0.3%
- **Central America**: 0.02%

### Members by Section

- **Cardiovascular Section**: 21.4%
- **Cell and Molecular Physiology Section**: 12.3%
- **Environmental and Exercise Physiology Section**: 10.9%
- **Central Nervous System Section**: 9.1%
- **Respiration Section**: 7.9%
- **Endocrinology and Metabolism Section**: 7.8%
- **Renal Section**: 7.3%
- **Neural Control and Autonomic Regulation Section**: 5.6%
- **Gastrointestinal and Liver Physiology Section**: 5.6%
- **Teaching of Physiology Section**: 4.5%
- **Comparative and Evolutionary Physiology Section**: 3.9%
- **Water and Electrolyte Homeostasis Section**: 2.3%
- **None**: 1.4%
APS conferences are leading venues for sharing new and exciting research discoveries in physiology, fostering collaboration and scientific innovation. Over 4,900 physiologists attended APS conferences in 2017.

**EXPERIMENTAL BIOLOGY 2017**
- CARDIOVASCULAR AGING: NEW FRONTIERS AND OLD FRIENDS
  - April 22–26
  - Chicago, IL
- PHYSIOLOGICAL BIOENERGETICS: MITOCHONDRIA FROM BENCH TO BEDSIDE
  - August 11–14
  - Westminster, CO
- PHYSIOLOGICAL AND PATHOPHYSIOLOGICAL CONSEQUENCES OF SICKLE CELL DISEASE
  - August 27–30
  - San Diego, CA
- EXPERIMENTAL BIOLOGY 2017
  - November 6–8
  - Washington, DC

**NUMBER OF ATTENDEES**
- 12,527
  - 37% were physiologists
- 100
- 119
- 124

↑ EB 2017 attendees proudly display their APS “#ActualLivingScientist” and “Physiology-Life, Logic, Study” T-shirts.

↑ An EB 2017 attendee explores the APS Human Physiology Clever Catch ball, a great teaching aid.
APS provided over 400 awards totaling more than $1 million in 2017 to recognize excellence in research, teaching and professional service and support the career development and research efforts of physiologists. Generous individuals and organizations support these much-needed awards, without which we would be unable to offer them.

**HURRICANE RELIEF AWARDS**

In fall 2017, APS created a Hurricane Relief Fund to help our scientific colleagues and friends to cope with the devastating effects of Hurricanes Harvey, Irma and Maria. The Society has since provided 18 graduate students and postdoctoral fellows impacted by these storms with up to $2,000 each in unrestricted funds to help them replace belongings, pay for relocation costs and more.

One of the trainees who received an APS Hurricane Relief Award was Maria Diehl, a postdoctoral fellow at the University of Puerto Rico School of Medicine. She used the award to help cover the costs of flying to the States and purchasing relief supplies and to support her volunteer efforts at Cayo Santiago, a Caribbean Primate Research Center, which was devastated by the storm.

“The recovery process will be long and slow, but we are so grateful to have organizations like APS to help the scientists of Puerto Rico realize that those on the mainland have not forgotten us as we rebuild our lives and the lives of those around us. These donations will help keep science alive and growing in Puerto Rico.” — Maria Diehl

**EARLY-CAREER PHYSIOLOGIST AWARDS**

Early-career physiologists in particular benefit tremendously from unrestricted funds that allow them to explore new research areas, purchase essential—and often costly—equipment and attend meetings. Ultimately, these awards help produce exciting discoveries that lead to improvements in health. These awards are made possible through annual contributions from corporations and foundations as well as endowments established by APS members and/or their families. More information about APS awards may be found at the-aps.org/awards.

![Maria Diehl (right) and other postdocs and graduate students in the lab of PI Gregory J. Quirk (middle).](image)

_**ADInstruments Macknight Early Career Innovative Educator Award**_

Katherine Wilkinson, PhD
San Jose State University

_**Data Sciences International (DSI) Dean Franklin Young Investigator Award**_

Aaron Polichnowski, PhD
East Tennessee State University

_**SandR Foundation Ryuji Ueno Award**_

Young Charles Jang, MS, PhD
Georgia Institute of Technology

_**Giles F. Filley Memorial Award for Excellence in Respiratory Physiology and Medicine**_

Tatum Simonson, PhD
University of California, San Diego

_**Arthur C. Guyton Award for Excellence in Integrative Physiology**_

Justin Grobe, PhD
University of Iowa

_**Giles F. Filley Memorial Award for Excellence in Respiratory Physiology and Medicine**_

Mahendra Damarla, MD
Johns Hopkins University

_**Lazaro J. Mandel Young Investigator Award**_

Prabhleen Singh, MD
University of California, San Diego

_**Shih-Chun Wang Young Investigator Award**_

Jin O-Uchi, MD, PhD
Rhode Island Hospital, Brown University
Among the most respected and frequently cited in the world, APS publications cover the breadth of physiological research, from the cellular and molecular to the organ and system level.

In 2017, APS published ~3,000 peer-reviewed original research and review articles in 15 journals and published 10 book monographs. The Society’s *Physiological Reviews* journal provides state-of-the-art coverage of timely issues in physiology and biomedicine and currently and consistently ranks No. 1 in the field of physiology.

**NEW AND IMPROVED APS JOURNALS USER EXPERIENCE**

We are excited that as of December 2017, 13 of our journals have a new look and feel (the others will be joining in 2018), with improved discoverability and functionality. The new online journal platform was designed to prioritize readers’ and authors’ needs and offers an enhanced user experience.

Highlighted Features and Functionality

- Universal login (single sign-on) with APS member credentials
- Mobile-friendly interface
- Side-by-side full-text reading that places figures and references alongside text
- Prominent display of audio-visuals (e.g., video abstracts and podcasts)
- Interactive PDFs with image enlargement and citation links
- Enhanced searchability across journals

Among the many new features we are most excited about is the addition of a single sign-on portal. Single sign-on allows current APS members to use their membership login credentials to access their journal account, which eliminates the need to register for a new account. APS journals are free to members.

**CREATION OF THE SCIENTIFIC SOCIETY PUBLISHER ALLIANCE**

In November 2017, the Scientific Society Publisher Alliance (SSPA) launched its website to raise the visibility of scientific journals published by societies, which “provide authors with the opportunity to have their work validated by peers in a fair manner for publication in a prestigious journal managed by working scientists” ([https://byscientistsforscience.org](https://byscientistsforscience.org)). The founding societies, including APS, seek to promote the unique values of journals owned by mission-driven societies that emphasize quick yet robust peer review, working scientists who serve as the editors as well as the reviewers, and reinvestment in the communities from which the journals are generated.

You can also help spread the word about SSPA—and the society journals that it promotes. Importantly, we hope you will continue to support society journals by submitting manuscripts.
ADVOCACY ON CAPITOL HILL

The Office of Science Policy helps physiologists bring their concerns to members of Congress through the work of the Science Policy Committee (SPC) and the Animal Care and Experimentation (ACE) Committee. Science policy staff work with the committees to help them arrange appointments with their senators and representatives. The SPC sponsors the Early Career Advocacy Fellowship (ECAF), offering APS members who are embarking upon careers in science the opportunity to learn more about science policy and improve their advocacy skills. As part of this program, the ECAF Fellows join the SPC for Hill visits.

In 2017, the SPC went to Capitol Hill on June 27, accompanied by several ECAF Fellows. In meetings with staff in 22 offices, these APS members thanked members of Congress and their staff for increases in National Institutes of Health (NIH) funding over the past two years. They also urged Congress to provide additional funds for the NIH in the coming year as well as to increase funding for life sciences research sponsored by the National Science Foundation, Department of Veterans Affairs and NASA.

During the ACE Committee Hill Day on September 26, 17 current and former ACE Committee members visited Capitol Hill to explain the importance of humane animal research and provide insights on current legislative issues.

The Office of Science Policy has also developed “do-it-yourself” advocacy materials that are posted to the APS website (the-aps.org/advocacy) for anyone to use.

DEVELOPING RESOURCES TO HELP MEMBERS ENHANCE RESEARCH RIGOR

The SPC is working to address issues seen as contributing to a lack of reproducibility in biomedical research. The SPC sponsored a symposium at Experimental Biology 2015 to explore reasons why some research has not been reproducible and how the scientific community can begin addressing the underlying causes. The committee organized a second session at Experimental Biology 2017 to identify ways to enhance the rigor and reproducibility of science through increased transparency in scientific reporting and grant applications, by training students to perform rigorous research and by using innovative data visualization tools to improve transparency in the presentation of scientific findings. These sessions were recorded and are available on the APS website (the-aps.org/reproducibility) along with supplemental resources.
APS works to inform the general public about the contributions of physiologists to many biomedical and biological advances.

**PRESS RELEASES**

Our longstanding press release program promotes studies published in APS journals to the media. Our press releases have been featured in news outlets such as the New York Times, L.A. Times and National Geographic.

**BLOGS**

The Society’s I Spy Physiology blog highlights physiological concepts experienced in everyday life. The Society also hosts the Life Lines blog, penned by anonymous comparative physiologist Dr. Dolittle, which discusses the fantastic physiology of animals.

**PHYSIOLOGYINFO.ORG**

APS public-facing website is a fantastic resource for general information on the body’s organ systems and the history of physiological discovery. It even has fun quizzes to test your knowledge.

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**2017 APS/AAAS MASS MEDIA SCIENCE AND ENGINEERING FELLOW**

“...This has been one of the best summers of my life. My time at STAT has reshaped how I think of science journalism. ... Thank you so much for this amazing opportunity.”

In an effort to empower scientists to effectively communicate research, APS sponsors a young scientist in the AAAS Mass Media Science and Engineering Fellows program. This 10-week summer program places science, engineering and mathematics trainees at media organizations nationwide. Fellows use their academic training as they research, write and report today’s headlines, sharpening their abilities to communicate complex scientific issues to the public.

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**SOCIAL MEDIA**

APS actively uses social media to promote new discoveries in physiology, increase public awareness of the discipline and engage our members. Platforms include Facebook, Twitter, LinkedIn and YouTube.

Got a physiological concept you’d like the general public to know about? Contact the APS Communications Office at communications@the-aps.org to be an I Spy Physiology guest blogger!
Recognizing the importance of science education and training, APS provides programs to keep students engaged in physiology from early elementary through graduate school and to provide postdoctoral fellows and early-career physiologists with the professional development they need for success in physiology research and teaching careers. Importantly, knowing that diversity is a key driving force for innovation, APS continues to work diligently to increase diversity within the physiology workforce by supporting underrepresented minority trainees.

CELEBRATING THE 50TH ANNIVERSARY OF THE PORTER FELLOWSHIP

Since 1967, in partnership with the William Townsend Porter Foundation, the Society has provided graduate research fellowships to 144 underrepresented racial and ethnic minority students enrolled in programs leading to a PhD in physiology.

In 2017, APS held a 50th anniversary celebratory brunch for the Porter Fellowship program during our annual meeting to recognize and celebrate the successes of past Porter Fellows and to raise awareness about the need for additional funding for the program. During the event, APS unveiled a commemorative plaque bearing the names of all Porter Fellows over the past 50 years, an anniversary booklet and a glass memento that was given to each Fellow.

Immediately following the celebration, WebsEdgeHealth interviewed Pamela Gunter-Smith—former Porter Fellow and Porter Committee chair who is currently serving as president of York College of Pennsylvania and chair of the Porter Foundation—about what APS is doing to address diversity in science and the importance of the Porter Fellowship. A video of this interview was played at select locations during our 2017 annual meeting.

PRESENTING THE FIRST A. CLIFFORD BARGER UNDERREPRESENTED MINORITY MENTORSHIP AWARD

At EB 2017, APS presented the first A. Clifford Barger Underrepresented Minority Mentorship Award to Caroline A. Appleyard from Ponce Health Sciences University, recognizing her outstanding leadership, guidance and mentorship of underrepresented minority students in physiology. The award is named in honor of A. Clifford Barger, who championed the idea of using the Porter Fellowship as a vehicle for attracting more underrepresented minorities to physiology and APS.

Caroline A. Appleyard (left) receiving the first Barger Award, with Porter Committee Chair Layla Al-Nakkash (center) and A. Clifford Barger’s daughter, Shael Barger (right).
2017–2018 PORTER FELLOWS

Chinwendu Amazu  
The Washington University School of Medicine in St. Louis  
Mechanisms of uterine muscle contractility in pregnancy and labor

Olubusayo Awe*  
Johns Hopkins School of Medicine  
Hepatic Kisspeptin 1 in reproduction and metabolism

Victoria Parker*†  
University of Iowa  
Interaction of chlorinated PCBs and sulfotransferases in endocrine regulation

Rebecca M. Parodi-Rullán  
University of Puerto Rico Medical Sciences Campus  
Cardiovascular remodeling and mitochondrial dysfunction during heart failure and ischemia/reperfusion

Naomy D. Rios-Arce  
Michigan State University  
Role of lymphocytes in Lactobacillus reuteri 6475 effects on bone density

Candy Rivas*  
University of Arizona  
Protease-activated receptor 2 in asthma and airway relaxation

Crystal M. Taylor  
University of Alabama at Birmingham  
The effect of 0-GlcNAcylation on invitro calcification

Diarra Williams*  
Texas A&M University  
Bone turnover mechanisms in hypogonadism and Down syndrome

* Second-Year Fellow  
† Eleanor Ison Franklin Fellow
INVESTMENTS

Of the total invested funds of $71.4 million at December 31, 2017, $67.7 million was invested in a portfolio of professionally managed long-term funds, and the remaining $3.7 million was invested in short-term funds that support the Society’s general operations, including several small award programs and the Society’s sections. Professionally managed long-term funds support the Society’s numerous larger awards programs and contribute to its reserve fund. Up to 5 percent of the trailing three-year balance of the reserve fund may be used to support the annual operating budget. Investments in the long-term fund enjoyed a return of 14.6 percent in calendar year 2017.
## Statements of Financial Position at December 31

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>$ 739,890</td>
<td>$ 429,673</td>
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<tr>
<td>Investments</td>
<td>71,435,734</td>
<td>64,661,652</td>
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<tr>
<td>Accounts receivable</td>
<td>386,099</td>
<td>392,949</td>
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<tr>
<td>Pledges receivable</td>
<td>578,032</td>
<td>520,215</td>
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<tr>
<td>Accrued interest and dividends</td>
<td>162,697</td>
<td>123,407</td>
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<tr>
<td>Advances to section editors</td>
<td>30,001</td>
<td>65,753</td>
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<tr>
<td>Prepaid expenses</td>
<td>230,916</td>
<td>326,868</td>
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<tr>
<td>Inventory</td>
<td>40,998</td>
<td>63,510</td>
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<tr>
<td>Leasehold improvements</td>
<td>59,102</td>
<td>–</td>
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<tr>
<td>Security and rent deposits</td>
<td>144,972</td>
<td>–</td>
</tr>
<tr>
<td>Furniture, fixtures and equipment</td>
<td>997,064</td>
<td>1,274,130</td>
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<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td>$ 74,805,505</td>
<td>$ 67,858,157</td>
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<tr>
<td><strong>Liabilities and net assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and accrued expenses</td>
<td>$ 1,933,177</td>
<td>1,633,068</td>
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<tr>
<td>Unearned revenue-subscriptions</td>
<td>6,383,699</td>
<td>5,778,902</td>
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<tr>
<td>Unearned revenue-dues and other</td>
<td>507,431</td>
<td>523,811</td>
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<tr>
<td><strong>TOTAL LIABILITIES</strong></td>
<td>8,824,307</td>
<td>7,935,781</td>
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<tr>
<td><strong>NET ASSETS</strong></td>
<td>65,981,198</td>
<td>59,922,376</td>
</tr>
<tr>
<td><strong>TOTAL LIABILITIES AND NET ASSETS</strong></td>
<td>$ 74,805,505</td>
<td>$ 67,858,157</td>
</tr>
</tbody>
</table>

## Statements of Activities and Changes in Net Assets at December 31

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating revenue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscriptions</td>
<td>$ 11,380,762</td>
<td>$ 11,289,219</td>
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<tr>
<td>Author fees</td>
<td>2,084,545</td>
<td>2,956,053</td>
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<tr>
<td>Membership dues</td>
<td>1,092,990</td>
<td>1,148,614</td>
</tr>
<tr>
<td>Conferences and meetings</td>
<td>917,776</td>
<td>1,040,994</td>
</tr>
<tr>
<td>Grants and contracts</td>
<td>513,602</td>
<td>607,979</td>
</tr>
<tr>
<td>Contributions</td>
<td>704,953</td>
<td>666,260</td>
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<tr>
<td>Advertising</td>
<td>145,871</td>
<td>155,530</td>
</tr>
<tr>
<td>Other income</td>
<td>354,587</td>
<td>530,305</td>
</tr>
<tr>
<td><strong>TOTAL OPERATING REVENUE</strong></td>
<td>17,195,086</td>
<td>18,394,954</td>
</tr>
<tr>
<td><strong>Operating expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publications</td>
<td>11,224,204</td>
<td>11,106,871</td>
</tr>
<tr>
<td>Membership and meetings</td>
<td>2,523,654</td>
<td>2,521,878</td>
</tr>
<tr>
<td>Education</td>
<td>2,265,527</td>
<td>2,341,058</td>
</tr>
<tr>
<td>Marketing and communications</td>
<td>1,203,199</td>
<td>1,114,271</td>
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<tr>
<td>Science policy</td>
<td>969,889</td>
<td>905,654</td>
</tr>
<tr>
<td>Council designated</td>
<td>1,104,405</td>
<td>882,622</td>
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<tr>
<td>Development</td>
<td>521,621</td>
<td>483,834</td>
</tr>
<tr>
<td><strong>TOTAL OPERATING EXPENSES</strong></td>
<td>19,812,499</td>
<td>19,356,188</td>
</tr>
<tr>
<td><strong>OPERATING CHANGE IN NET ASSETS</strong></td>
<td>(2,617,413)</td>
<td>(961,234)</td>
</tr>
</tbody>
</table>

| **Income from investments** |              |              |
| Net realized gains         | 4,449,227    | 252,0187     |
| Net unrealized gains/(losses) | 3,564,785 | (719,486)    |
| Interest and dividends     | 1,266,113    | 1,183,764    |
| Investment management fees | (603,890)    | (679,201)    |
| **NET INCOME FROM INVESTMENTS** | 8,676,235 | 2,305,264   |
| Change in net assets       | 6,058,822    | 1,344,030    |
| Net assets, beginning of year | 59,922,376 | 58,578,346  |
| **NET ASSETS, END OF YEAR** | $ 65,981,198 | $ 59,922,376 |
APS Member Virendra Mahesh Promotes Young Scientists’ Careers

Virendra Mahesh, PhD, DPhil, has contributed to APS in many roles since first joining the Society in 1975. Although his discoveries in the field of reproductive endocrinology have been the highlight of his career, he’s always been an avid supporter of the careers of young researchers because he believes his legacy will be carried on through the young scientists in the field. With his ongoing gifts to APS, he hopes to encourage and support young investigators pursuing research in the area of endocrinology.

We recently caught up with Mahesh, who told us about his career path in science, his involvement in APS and the legacy he hopes to leave to the field.

**FIRST INTEREST IN SCIENCE**

Mahesh was born and raised in a part of British India that is now Pakistan. In third grade, his science teacher sparked his curiosity in science and set him on a path to study organic chemistry. He completed his bachelor's degree in the field in 1951 and went on to do a PhD at the University of Delhi, working on organic compounds in pinewood. Pinewood was resistant to insects, so he extracted compounds from the wood to find out which ones function as insecticides. Around that time, the burgeoning field of steroid hormones caught his interest. “But the work was mainly done by physiologists who had comparatively little knowledge of complex steroid hormone structures,” he said.

Wanting to work in an area with direct applications to human health, and seeing a gap where he could contribute his expertise, Mahesh went to the University of Oxford to do a postdoctoral fellowship studying steroid hormones with Dr. Ian Bush, who he credits as being his most influential mentor. At Oxford, he completed a DPhil degree within two years studying mechanisms of hormone action.

Toward the end of his postdoctoral fellowship, Mahesh wanted to return to India, but Dr. CNH Long, chair of physiology at Yale University, invited him to come establish the techniques he’d learned at Oxford in the lab at Yale. Mahesh couldn’t turn down the opportunity. While he was at Yale, a prominent endocrinologist by the name of Robert Greenblatt invited him to join the Medical College of Georgia (now Augusta University) as a faculty member. Greenblatt had clinical patients with little-understood endocrine disorders, and he needed the lab techniques in hormone measurements that Mahesh had mastered to solve the puzzle.

Together at the Medical College of Georgia, Mahesh and Greenblatt discovered the physiological basis for polycystic ovarian syndrome (PCOS), an endocrine disorder characterized by cysts in the ovaries, anovulation and hirsutism. They discovered that, contrary to previous belief, ovaries could secrete significant amounts of androgens, which caused the disorder. Further investigations led them to a compound that very effectively stimulated ovulation, thus providing a way for anovulatory women to ovulate and get pregnant. The compound, commercially known as Clomid, is still the first-line medication used to induce ovulation. Further work involved research in the complex pathways in the neuroendocrine control of gonadotropin secretion and ovulation.
GETTING INVOLVED IN APS

Mahesh became a member of APS in 1975, while on the faculty at the Medical College of Georgia. He was a member of the APS Joint Program Committee from 2001 to 2004 and chair of the Endocrinology and Metabolism Section from 2004 to 2006. He also served as a member of the board of directors of FASEB, the umbrella society that includes APS and about two dozen other scientific societies, from 2004 to 2007 and from 2008 to 2012.

Over his career leading a successful research program that elucidate how reproductive hormones work, Mahesh trained 11 masters students, 25 PhDs and 59 postdoctoral fellows. “All that time, I recognized that the impact of this work would remain in the hands of the people I trained,” Mahesh said. “So the career development of young scientists became a major goal in my life.” In recognition of the outstanding contribution he made to the career development of young scientists, the Medical College of Georgia at Augusta University established an endowed Virendra B. Mahesh, PhD, DPhil, Distinguished Chair in Neuroscience in 2017.

Mahesh encouraged his trainees to get involved in APS, not just because it could expose them to new techniques and ideas that would advance their research, but also because the networking and workshops would help them gain practical skills for a scientific career. “Society membership is extremely important for career development,” he said. “It’s an opportunity to present your work, network and participate in discussion. Society meetings also give you the opportunity to participate in state-of-the-art lectures and learn about practical things like grant writing and finding a good job. All in all, the APS is very supportive of the career development of young people,” he said.

Mahesh also highlighted another reason he’s involved in APS: the society’s effectiveness in advocating for science funding and communicating the importance of basic scientific research to Congress and the public. “Funding for science depends on Congress,” he said.

LEAVING A PROFESSIONAL LEGACY

After joining the Medical College of Georgia, Mahesh was rapidly promoted and chaired the department of endocrinology from 1972 to 1986 and the department of physiology and endocrinology from 1986 to 1999, before retiring in 1999. During his career, he was funded continuously by the National Institutes of Health (NIH) for more than 40 years and published more than 400 peer-reviewed papers. He served on the NIH reproductive biology study section and the human embryology and development study section, as well as several ad hoc study sections.

In thinking about his legacy, he first thinks of his groundbreaking discoveries in reproductive endocrinology, which he hopes others will learn about and build on. He also notes the young scientists he’s mentored. “Your legacy is living in all the students and postdocs that you trained,” he said.

To continue to support the careers of young endocrinologists, he’s made consistent annual gifts to APS. Since 2004, his support has made possible an APS award, the Virendra Mahesh Award of Excellence in Endocrinology, for the best paper presented at the annual Experimental Biology meeting by a graduate student or postdoc in the area of endocrinology. His hope is to encourage young scientists in this field. “If you really want to be involved in the progress of science, it is the future generations of scientists that will multiply your efforts in advancing science,” he said.

“The career development of young scientists became a major goal in my life.”
In fall 2017, The Hearst Foundations provided APS with a generous $50,000 grant in support of the Society’s Undergraduate Summer Research Fellowships (UGSRF) program. The funds will be used to fund immersive laboratory research experiences for five undergraduate students who are underrepresented in science, technology, engineering and math (STEM) careers. Students will spend 10 weeks working in the labs of APS member-researcher hosts and complete online interactive professional development lessons. Hands-on research experiences such as the UGSRF are critical to keeping students engaged in pursuing a STEM research career.

"APS has had phenomenal success in attracting and retaining undergraduate students in STEM research careers," said APS Executive Director Martin Frank, PhD. "Historically, we have relied on government grants to support programs for underrepresented students. But in recent years, some of these funding sources have no longer been available, making support from the prestigious Hearst Foundations that much more timely and necessary."

UGSRF awardees are selected based on academic merit, the quality of the proposed experience and the availability of appropriate faculty mentors. Each Hearst Fellow will receive a stipend and housing allowance plus additional travel funds to present his or her research at the APS annual meeting. Research hosts receive funds for lab supplies for the fellow’s summer research project. Fellows also receive online professional development on career planning.

In follow-up surveys, fully 95 percent of UGSRF awardees reported applying to advanced degree programs. For those who had graduated and been accepted to such programs, nearly half went into PhD or MD/PhD graduate research programs. Research continues to be an important part of awardees’ current and future career plans with more than two-thirds continuing their involvement in research four years after participating in the program.

ABOUT THE HEARST FOUNDATIONS

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For those individuals who are passionate about scientific discovery and improving health, the opportunity to make an exceptional impact by donating to APS programs is extraordinary.

Annual gifts and grants supported numerous awards, fellowships and important programs that otherwise would not have been possible. In 2017, with support from members and non-members along with for-profit and nonprofit organizations, private foundations and the federal government, APS raised a total of $1,142,443.

Importantly, 2017 marked the first year of a three-year strategic partnership with ADInstruments.

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