2017-18
ANNUAL
REPORT

Department of Chemistry
We conduct RESEARCH with courage—willing to step outside the box and try something new.

We approach EDUCATION with curiosity—because sometimes questions are more important than answers.

We pursue GREATNESS with passion—confident that together we can achieve extraordinary things.

Building on a rich history of achievement, we aspire to an even brighter future. With you. With Illinois.

Visit www.chemistry.illinois.edu to learn more.
9,345 Alumni
55 Countries

**TOP 5 U.S. METROPOLITAN AREAS FOR ALUMNI**

<table>
<thead>
<tr>
<th>Area</th>
<th>#</th>
<th>% of US total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago-Naperville-Elgin</td>
<td>2160</td>
<td>24%</td>
</tr>
<tr>
<td>Philadelphia-Camden-Wilmington</td>
<td>327</td>
<td>4%</td>
</tr>
<tr>
<td>New York-Newark-Jersey City</td>
<td>298</td>
<td>3%</td>
</tr>
<tr>
<td>San Francisco-Oakland-Hayward</td>
<td>238</td>
<td>3%</td>
</tr>
<tr>
<td>Washington-Arlington-Alexandria</td>
<td>203</td>
<td>2%</td>
</tr>
<tr>
<td>Total of Top 5</td>
<td>3226</td>
<td>36%</td>
</tr>
</tbody>
</table>

**FROM 55 COUNTRIES**

Republic of Korea 83
Canada 51
China 47
Taiwan, Republic of China 26
India 18

**TOP 5 COUNTRIES OUTSIDE U.S.**

**UNDERGRADUATE DEGREES (68)**

- BSLAS: Chemistry 135
- BS: Chemistry 26
- BS: Chemistry + Computer Science 8
- MS: Chemistry 15
- MS: Teaching of Chemistry 1
- PhD: Chemistry 52

**GRADUATE DEGREES (203)**

- MS: Teaching of Chemistry 3

**PLACEMENTS FOR 2018 GRADUATES**

<table>
<thead>
<tr>
<th></th>
<th>Average Salary</th>
<th>Employer</th>
<th>Top Industry</th>
<th>Top First Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>$ 42,185</td>
<td>Cargill</td>
<td>Software/tech</td>
<td>57% graduate/professional school 43% industry</td>
</tr>
<tr>
<td>Graduate</td>
<td>$ 100,376</td>
<td>Intel</td>
<td>Software/tech</td>
<td>32% postdoc 54% industry 11% academic 3% government/other</td>
</tr>
</tbody>
</table>

*Results provided by graduates who elected to report.*
**FACULTY**

88 FACULTY

![Circle chart showing faculty by type: 39 Tenure-Track, 18 Emeritus & Retired, 10 Affiliate, 10 Research, 10 Instructional, 10 Adjunct, 1 Emeritus & Retired]

**2017-18 RESEARCH ACHIEVEMENTS**

- Proposals funded at $25.2 million
- 37 Active clinical trials*
- 9 Licenses & options
- 52 U.S. patents issued
- Million in research expenditures
- 23 U.S. patents issued
- 25 Disclosures

**FUNDING SOURCE**

<table>
<thead>
<tr>
<th>Grants</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Institute of Health</td>
<td>9 $16,142,214</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>8 $3,605,895</td>
</tr>
<tr>
<td>Private Funding</td>
<td>20 $3,465,035</td>
</tr>
<tr>
<td>U.S. Department of Energy</td>
<td>5 $1,365,430</td>
</tr>
<tr>
<td>U.S. Department of Defense</td>
<td>3 $703,767</td>
</tr>
<tr>
<td>Total</td>
<td>45 $25,282,341</td>
</tr>
</tbody>
</table>

**WORLDWIDE COLLABORATION**

Visit www.experts.illinois.edu to learn more about our collaborative research output around the world.

**TENURE-TRACK FACULTY BY RESEARCH AREA**

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>Chemical Biology</td>
<td>15</td>
</tr>
<tr>
<td>Inorganic Chemistry</td>
<td>7</td>
</tr>
<tr>
<td>Materials Chemistry</td>
<td>16</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>12</td>
</tr>
<tr>
<td>Physical Chemistry</td>
<td>15</td>
</tr>
</tbody>
</table>

Several faculty conduct research in multiple areas.

**AN INTERDISCIPLINARY APPROACH**

- 31 (80%) of our tenure-track faculty have at least 1 appointment in another Illinois department, and 23 (59%) have 2 or more
- 6 (15%) hold administrative positions for major centers and institutes at Illinois and elsewhere, including the Beckman Institute and Carle Illinois College of Medicine
GET TO KNOW OUR INCOMING STUDENTS

115  INCOMING UNDERGRADUATE STUDENTS

76  Illinois
5  Non-resident
24  Int'l
5  Transfer Illinois
5  Transfer Int'l

INCOMING GRADUATE STUDENTS

60

27  Female
33  Male
11  Int'l
49  Domestic
4  URM* Female
3  URM* Male

Image: Nitya Sai Reddy Satyavolu and Yiming Wang

Funding

- Research Assistantship 144
- Teaching Assistantship 100
- Full Fellowship 50

Total 294

Fellowships (full & partial)

- Departmental/Donor-Funded 131
- External - NSF 20
- External - Other 16
- Campus 10

Total 177

*Underrepresented Minority
Active Gift Funds

$2,500 - $4,999
Dr. Peter K. Dorhout and Mrs. Carolyn W. Dorhout
Dr. Marcetta Y. Darensbourg and Dr. Donald J. Darensbourg

$5,000 - $9,999
Dr. John Witt and Mrs. Margaret R. Witt

$10,000 - $24,999
Mr. Robert F. Green and Mrs. JoAnn R. Green

$25,000 - $99,999
Dr. Gregory S. Girolami and Dr. Vera Virginia Mainz

$100,000+
Mr. Norman R. Dean and Mrs. Melanie K. Dean

We gratefully acknowledge these, and all our donors for their generous support. The following list includes individuals who made gifts to the Department of Chemistry between July 1, 2017 and June 30, 2018.**

**Includes outright gifts and payments on major gift pledges made prior to FY18; does not include new major gift commitments.

The success of our teaching and research is possible because of the consistent support of our alumni and friends. We are currently raising support as part of Wth Illinois, the university’s largest philanthropic campaign to date. Whether your gifts benefit students, faculty, research, or facilities, you are making a difference! Thank you for your generosity.

Vision 2020, Chemistry Partnership, and LAS Annual Fund for Chemistry
These funds provide unrestricted support to meet the department’s most pressing needs. In 2017-18, your gift went towards:

• Speakers for departmental seminars and lectures
• Programming for our graduate students, including recruiting and orientation
• Undergraduate student convocation awards
• Faculty and research support

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Science as art
The following images were created by students and faculty in the School of Chemical Sciences (SCS).

Mikayla Yoder and Maggie Bridgewater (Nuzzo Group)
Taken on an optical microscope, this image of a silicon solar microcell array was edited in ImageJ. Given the varying oxide thicknesses, the silicon dioxide layers are vibrantly colored when viewed under the microscope, and this image attempts to abstractly re-create that which is lost upon rendering into a black-and-white snapshot.

Adina Badea (Nuzzo Group)
Confocal fluorescence micrograph of primary dorsal root ganglion cells cultured on a Silicon 3D scaffold coated with a custom cell-adhesive protein. The neurons (red) and supporting glial cells (green) form complex intertwining networks with increased time in culture that abide by the geometric cues of the scaffold.

Prapti Kafle (Diao Group)
Cross-polarized microscopy image of multilayered film consisting of alternate layers of an anti-cancer drug ellipticine and an edible polysaccharide polymer, pullulan. The nanothin film, produced by successive shearing of the drug and polymer solutions on silicon, embraces a magnificent morphology with needles and spherulites, that evokes colorful elements of nature unique to the spectator’s imagination.

Nitya Sai Reddy Satyavolu and Yiming Wang (Lu Group)
A false-colored SEM image of gold nanoparticles. The 2D gold nanostructures were synthesized using iodide as the capping agent which allows the final nanoparticles to be only a few nm thick and hundreds of nm in size. Excess gold precursor results in nanoprisms of different sizes.

Prof. Hyunjoon Kong and Prof. Steve Zimmerman
Vascular diseases are a major health problem in the United States. SCS faculty are exploring ways to better control the delivery of medicine through nanoparticles and improve transport of stem cells to repair damaged tissue. In this image, cells are coated with bioactive nanoparticles that guide stem cells to inflammatory vascular walls.

On the cover:
Sizhu You (Suslick Group)
This is a false-colored SEM image showing the morphological features developed on the surface of a sucrose crystal that is caramelized under ultrasonic irradiation.

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