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Honoring Peter C. Nowell and the Inaugural Peter C. Nowell, MD, Professor Kojo S. Elenitoba-Johnson

In a long-anticipated honor for Peter C. Nowell, the Lasker Award-winning Penn luminary who co-discovered the Philadelphia chromosome, an endowed professorship has been established in his name. The reception to recognize Dr. Nowell's career accomplishments and to welcome the inaugural Peter C. Nowell, MD, Professor, Kojo S. Elenitoba-Johnson, will be held at 6 p.m. on *October 20* in the Henry A. Jordan, M'62 Medical Education Center.

Dr. Nowell, the Gaylord P. and Mary Louise Harnwell Emeritus Professor of Pathology and Laboratory Medicine at the Perelman School of Medicine, along with his research partner, the late David Hungerford, discovered the Philadelphia chromosome in 1960. This finding, an abnormally small chromosome in the cancerous white blood cells of patients with chronic myeloid leukemia (CML), was considered a watershed moment in cancer research, demonstrating the genetic basis for cancer, which ran counter to the prevailing thought at the time.

Their revolutionary work also formed the foundation for the clinical trials for Gleevec®, the Novartis Pharmaceuticals drug that received FDA approval in 2001 and has since stabilized disease in 95% of treated CML patients, and

been approved to treat 10 different kinds of cancer. In 1998, Dr. Nowell shared the Albert Lasker Clinical Medical Research Award, the nation's highest honor for biomedical research, with the University of Pennsylvania's Alfred G. Knudson, Jr. (*Almanac* September 22, 1998).

The chair was made possible through a collaborative effort by faculty, some of whom trained with Dr. Nowell, and myriad donors coming together from a broad swath of the Penn community. Many donors are, in fact, long-time supporters of the Abramson Cancer Center, for which Dr. Nowell served as the first director beginning in 1973.

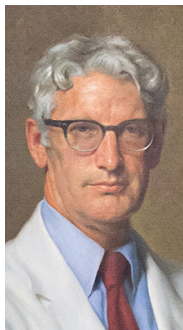
"I am deeply gratified that such stalwart supporters in our fight against cancer have chosen to honor the groundbreaking work that Dr. Nowell has contributed to oncology, innovations that shifted the cancer paradigm decades ago and that reverberate now in cancer immunotherapy," says Chi Van Dang, the John H. Glick, MD, Abramson Cancer Center Director's Professor and Director of the Abramson Cancer Center. "A professorship honoring Peter Nowell is one of many deserved plaudits for a genuine giant in Penn history and cancer discovery."

The designated chairholder, Dr. Elenitoba-Johnson, who joined Penn in July, is an international leader in the field of hematopathology, molecular pathology and mass spectrometry-driven proteomics. He is also the founding director of Penn Medicine's Center for Personalized Diagnostics and chief of the Division of Molecular and Genomic Pathology. His former laboratory at the University of Michigan is credited with hav-

ing identified several recurrent genetic abnormalities linked to the development and progression of a number of lymphoma subtypes.

"Dr. Elenitoba-Johnson is an inspired and ideal choice as the inaugural Peter C. Nowell, MD, Professor," said J. Larry Jameson, executive vice president for the Health System and dean of the Perelman School of Medicine. "He is an outstanding investigator whose research has already had significant impact, and I am excited by the prospect of future innovations, as transformative as Dr. Nowell's, arising from his work."

Dr. Elenitoba-Johnson earned his MD from the College of Medicine, University of Lagos, in Lagos, Nigeria. Subsequently, he went to the Brown University School of Medicine for his residency in anatomic and clinical pathology, and served as chief resident. He then moved on to the National Cancer Institute to complete a fellowship in hematopathology, as well as the Leadership Development for Physicians in Academic Health Centers program at the Harvard School of Public Health. Before arriving at Penn, he held the Henry C. Bryant Professorship at the University of Michigan and served as director of the Molecular Diagnostics Laboratory there.



Peter Nowell



Kojo Elenitoba-Johnson

Hosting German President Joachim Gauck

University of Pennsylvania President Amy Gutmann and Penn's Perry World House hosted Joachim Gauck, president of the Federal Republic of Germany, for a public lecture on shared US-German values. His lecture, *Freedom—our shared bond*, given on October 6, discussed many collaborations between the two countries since the mid-18th century, when Penn began this country's oldest German studies program in 1754, with the first professor of German hired in 1757. Benjamin Franklin traveled to Germany in 1766.

Dr. Gutmann introduced President Gauck: "We are deeply honored to have President Gauck visit our campus. He is a highly respected advocate of freedom and democratic principles, and brings a unique perspective to his talk given the current political challenges unfolding in Europe. I know his insights will be a source of inspiration to our students, faculty and staff."

President Gauck was elected by the Federal Convention on March 18, 2012, at which time he became the 11th president of the Federal Republic of Germany. He gained prominence in German politics for his involvement in the opposition in the German Democratic Republic (GDR) and the quest for freedom, democracy and human rights. A pastor for many years, he was one of the initiators of the church and popular resistance to the communist regime in the GDR, leading weekly prayers for peace that led to protest demonstrations.

President Gauck's visit to the United States came days after German Unity Day on October 3, a day marking the anniversary of German reunification in 1990. As a champion of freedom, he had helped usher in democracy 25 years ago.



His Excellency Joachim Gauck (above), president of the Federal Republic of Germany, gave a speech on "Freedom—our shared bond" in Houston Hall's Hall of Flags at Penn last Tuesday. His speech is online at www.bundespraesident.de/Shared-Docs/Reden/EN/JoachimGauck/Reden/2015/151006-USA-Philadelphia.html

IN THIS ISSUE

- 2 Senate: SEC Actions; Death; Clarification
- 3 Council: Coverage of October Meeting; Report of the Committee on Manufacturer Responsibility
- 4 For Comment: Code of Workplace Conduct for Penn Licensed Product Manufacturers
- 6 *So You Wanna Be an Archaeologist?*; Annual Penn Safety Fair; Models of Excellence Award Nominations; National Drug-Free Work Week
- 7 Update; Penn's Way; CrimeStats; Farm Life at the Arboretum; *MathThematic* at Esther Klein Gallery
- 8 Research Roundup

SENATE From the Senate Office

The following agenda is published in accordance with the Faculty Senate Rules. Any member of the standing faculty may attend SEC meetings and observe. Questions may be directed to Patrick Walsh, executive assistant to the Senate Office, either by telephone at (215) 898-6943 or by email at senate@pobox.upenn.edu

Faculty Senate Executive Committee Agenda

Wednesday, October 21, 2015

3-5 p.m.

College Hall, Room 205

1. Approval of the Minutes of September 30, 2015 (1 minute)
2. Chair's Report (10 minutes)
3. Past-Chair's Report (10 minutes)
4. 2015 Senate Nominating Committee (5 minutes)
5. Athletics and Recreation at Penn (30 minutes)
Conversation with Grace Calhoun, director of athletics and recreation
6. Eminent Threats of Campus Violence (15 minutes)
Conversation with Maureen Rush, vice president for public safety
7. Update from the Office of Investments (30 minutes)
Conversation with Peter Ammon, chief investment officer
8. New Business (5 minutes)

Death

Carolyn Hoff Lynch, Former Trustee and SAS Overseer

Carolyn Hoff Lynch, CW'68, the philanthropist and former Penn Trustee for whom the Carolyn Lynch Laboratory was named, died of complications from acute myeloid leukemia on October 1. She was 69 years old.

"Carolyn was an untiring advocate for education who was admired by the Penn community and all who knew her for her commitment to the life sciences, her dedication to women's issues and her strong interest in our students and faculty," noted Penn President Amy Gutmann. Ms. Lynch served on the Board of Trustees from 1997-2007, and was an asset to the Academic Policy, Neighborhood Initiatives and Student Life committees. She was a longtime overseer of the School of Arts & Sciences and a member of the Trustees' Council of Penn Women and its Fundraising Committee, which she once co-chaired; the Northeast Regional Advisory Board and the planning committee for the celebration of *125 Years of Women at Penn* that took place in 2001. When her daughter, Beth, was a student in the College, Ms. Lynch, along with her husband, Peter, also served as the founding co-chair of the Parent Leadership Committee.

Ms. Lynch's legacy to Penn is most clearly evident in the genesis of the Carolyn Lynch Laboratory, the life sciences facility for whose existence she was largely responsible (*Almanac* February 15, 2005). She had been deeply interested in the life sciences since her student days as a physical therapy major, and in 1996, she convened a group of alumni who were leaders in the biotechnology arena to study Penn's biology department and determine what actions it should take to best



Carolyn Lynch

prepare students for careers in emerging life sciences fields. Under Ms. Lynch's leadership, this Biology Advisory Board spent nearly a decade helping the department enhance its curriculum, planning a technologically advanced facility supporting interdisciplinary collaboration and engaging donors who could help make the building a reality. When her vision was achieved with the facility's opening in 2006 (*Almanac* July 11, 2006), the building and the pond in the adjoining James G. Kaskey Memorial Park were named in her honor in gratitude for her leadership, as well as for the Lynch Foundation's extraordinary \$10 million gift in support of the project. Ms. Lynch's other generous contributions to Penn included a fellowship and term chair in SAS (*Almanac* October 17, 2000), a chemistry lecture hall and an endowed scholarship.

Ms. Lynch's tremendous dedication to education was evident outside of Penn as well. As the daughter of an educator, she gave her time and resources to countless academic organizations in the Boston area and beyond. She was a trustee of the Campus School of Boston College, the Gregorian University Foundation and Deerfield Academy; an overseer of the New England Conservatory of Music; and a member of the Education Advisory Committee of the Boys and Girls Club of Boston and the Cell Biology and Pathology Advisory Council of Harvard University.

Moreover, as president of the Lynch Foundation, which supports hundreds of organizations each year, she and Mr. Lynch in 1999 contributed a history-making \$10 million gift to the School of Education at Boston College, where Mr. Lynch is a trustee. In recognition of that gift, which at the time was the largest ever to Boston College, the school was named in their honor. They increased their commitment to the Lynch School in 2010 with an additional \$20 million to create a Leadership Academy for principals that also bears their name.

Her contributions outside of education included service as a trustee of the Peabody Essex



Clarification

King Solomon (at left), the 14.5-foot bronze statue by Alexander Archipenko, first came to Penn's campus in 1985 on extended loan from Jeffrey H. and Sivia Loria. They formally donated the statue to Penn in honor of Judith Rodin's inauguration as Penn president in 1994. It is located on 36th Street across from the Annenberg Public Policy Center, which was

the site—from 1948-2003—of the old Penn Hillel building. This location gave the sculpture of the biblical king extra site-specific significance. When Penn's Hillel moved to the newly constructed Steinhardt Hall, their old building was eventually demolished in 2007.

See *Almanac* October 6, 2015 for a dozen of Penn's outdoor sculptures that are part of the University's collection.

Museum; a director of the Boys and Girls Club of Boston and the Museum Cooperative of Salem; vice chair of the New England Historic Genealogical Society; co-chair of the Marblehead/Swampscott YMCA Capital Campaign and a volunteer for the Society for the Preservation of New England Antiquities.

Earning a bridge world championship in 2013, she was a renowned "grand life master" of the game, also earning five national titles.

For her leadership and generosity, Ms. Lynch received numerous honors, including honorary degrees from Emmanuel College and Boston College, the Alexis de Tocqueville Award for Leadership from the United Way, the *Ad Majorem Dei Gloriam* Award from the Society of Jesus New England Province, the Pedro Arrupe Medal for Excellence in Ministry from the Weston Jesuit School of Theology, the Boys and Girls Club of Boston Partners of Youth Award, the Massachusetts Horticultural Society President's Choice Award, the Saint Julie Billiard Award of the Sisters of Notre Dame and the Papal Honor of Saint Gregory the Great.

Ms. Lynch is survived by her husband, Peter, WG'68, their three daughters, Mary Lynch Witkowski (Erik), Annie Carolyn Lukowski (Scott) and Elizabeth de Montrichard, C'06 (Gonzague); two sisters, Melanie Rapp (David) and Madalin O'Brien (William); six grandchildren; two nephews and a niece.

To Report A Death

Almanac appreciates being informed of the deaths of current and former faculty and staff members, students and other members of the University community. Call (215) 898-5274 or email almanac@upenn.edu

However, notices of alumni deaths should be directed to the Alumni Records Office at Room 517, Franklin Building, (215) 898-8136 or email record@ben.dev.upenn.edu

Coverage of October 7 University Council Meeting

Last Wednesday at the first University Council meeting of the fall semester, President Amy Gutmann announced the appointment of Therese (Terry) Richmond as the moderator of Council for the 2015-2016 year; Dr. Richmond is the Andrea B. Laporte Endowed Professor of Nursing and associate dean for research and innovation at the School of Nursing.

Dr. Gutmann then announced the appointment of Lauren Steinfeld as the parliamentarian for her third year. Ms. Steinfeld is Penn Medicine's chief privacy officer and senior advisor for privacy in Audit, Compliance and Privacy.

Reed Pyeritz, as chair of the University Council Steering Committee, announced the focus issues for this academic year: the history and current status of open expression at Penn (October 28); Penn Connects 2.0 (December 2); Penn's protocols for bringing and responding to complaints about sexual assault or misconduct and other Title IX issues (January 27) and cross-disciplinary and cross-school programs involving staff, students and faculty (February 17).

There will be two meetings that will include open forums: December 2 and February 17. Issues must be presented in advance.

The Council committees' general and specific charges for this academic year had been distributed prior to the meeting; there was neither discussion nor any questions raised about them.

Provost Vince Price introduced the discussion of the programs planned for the 2015-2016 Academic Theme Year: The Year of Discovery. The Penn Reading Project (PRP), which was held at the beginning of the semester with discussions about Langston Hughes' memoir, *The Big Sea* (*Almanac* December 9, 2014), was the cornerstone of the year for the first-year students. Vice Provost for Education Beth Winkelstein (*Almanac* May 26, 2015) said that while in past years the theme had been chosen before the book, this time the book had actually been chosen before the theme. This is one of the ways the Theme Year and PRP have been revised and reinvigorated.

David Fox, director of New Student Orientation and Academic Initiatives, added that the book set the stage for the Theme Year, which will have a variety of programming throughout the year, including an emphasis on student discovery at the Penn Innovation Conference on October 17 at Weiss Tech House; see penninnovation.seas.upenn.edu. This student initiative is intended

to create an engaging atmosphere for students to learn about and experience entrepreneurship first-hand. There will be a panel discussion next month as part of the Theme Year programming. Grant funding is still available for those who would like to plan an event. Visit yearofdiscovery.org for details.

The Campaign for Community (*Almanac* April 7, 2015) Steering Committee is also offering small grants and branding opportunities for those who would like to arrange events that "strengthen our community, finding ways to discuss and understand key issues that are too often avoided." The Steering Committee welcomes input from all members of the Penn community at any time at c4c@exchange.upenn.edu

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The following report for the 2014-2015 academic year was sent to Vice President and University Secretary Leslie Kruhly from Mark Stern, chair of the Committee on Manufacturer Responsibility (CMR), in accordance with the Code of Workplace Conduct. As outlined in the Code, the CMR will review the Code annually, as well as the effectiveness of monitoring, the state of compliance of the apparel licensees and any alleged violations of the Code.

The revised Code of Workplace Conduct for Penn Licensed Product Manufacturers is published For Comment on the following pages.

Report of the Committee on Manufacturer Responsibility

June 2015

It is my pleasure to report on the deliberations of the Committee of Manufacturer Responsibility during the 2014-2015 academic year. In accordance with the Code of Workplace Conduct for Penn Licensed Product Manufacturers, the Committee met for four regular meetings during the academic year. A fifth meeting was held to review proposed revisions to the Code. In addition to monitoring code compliance, the Committee's work this year included revising the Code to update the Code, correct certain errors and clarify its procedures.

Code Compliance

As of June 2015, 147 out of 153 licensees were reviewed and found to be in compliance with the Code. Six previous licensees did not respond to our questionnaire, and as a consequence, were not renewed for 2015-2016.

Revisions to the Code

Sean Burke, the representative of the Office of the General Counsel to the Committee, led the Committee's efforts to revise the Code.

The Committee determined that changes to the Code were necessary to ensure that its language is clearly worded, reflects the University's goals and is consistent with Penn's compliance oversight procedures. This past year, the Committee focused on ensuring that the language and concepts were clearly articulated throughout the document principally to facilitate the ability to enforce the regulations.

Several changes streamlined the Code's organization (for example, moving the section on overtime to the section on hours of work).

Substantive changes to the Code included adding language requiring manufacturers' work environments to be free from recognized hazards. Other changes, pertaining to remediation procedures, emphasized the University's right to terminate an agreement with a licensee if the licensee failed to correct a violation.

The Committee scheduled a special meeting on April 30, and voted unanimously to recommend these revisions. I am attaching a copy of our recommended revised Code.

On behalf of the Committee, I want to express my appreciation to Jacqueline Miraglia (Penn Center for Innovation) for her able staffing of the Committee and for overseeing the licensee compliance process.

It has been a privilege to serve as chair of the Committee during the past year. I will be on leave during fall 2015. In my absence, Steven Kimbrough of the Wharton School has agreed to serve as acting chair.

—Mark J. Stern, Chair
Kenneth L.M. Pray Chair, School of Social Policy & Practice

Members of the Committee on Manufacturer Responsibility 2014-2015

Mark Stern (*Chair*), Social Policy & Practice
Steven Kimbrough, Wharton
Jon Shaw, PPSSA
Yessenia Gutierrez, Civic House Associates Coalition
Amit Pujari, Civic House Associates Coalition
Aidan McConnell, Undergraduate Assembly
Gabrielle Nagler, GAPSA

Ex-Officio members

Jessie Burns, Provost's Office
Leah Popowich, President's Office
Christopher Bradie, Business Services
Sean Burke, Office of the General Counsel
Leslie Mellet, Office of the Secretary

Response

Thank you for forwarding your report on the work of the Committee on Manufacturer Responsibility in 2014-2015. I commend you and the Committee for your deliberations over this past year, particularly your thorough review of the Code and careful work in ensuring its alignment with the University's goals.

Please accept my thanks for your significant contributions of time and talent during this past year as chair of the Committee. I look forward to your continued leadership upon your return from sabbatical in January. The Committee is in good hands with Steve Kimbrough as acting chair this semester.

—Leslie Kruhly, Vice President and University Secretary

A revision of Penn's policy of the Code of Workplace Conduct for Penn Licensed Product Manufacturers (originally published in *Almanac* on March 28, 2000; revised September 18, 2012) appears below. We welcome comments regarding this revised policy. Comments should be sent to Leslie Mellet at melletl@upenn.edu or the Office of the University Secretary, 211 College Hall/6303 no later than *October 30, 2015*.

—Leslie Kruhly, Vice President and University Secretary

Code of Workplace Conduct for Penn Licensed Product Manufacturers

I. Introduction

With a view to stimulating economic growth and development, raising living standards, meeting staffing requirements and overcoming unemployment and underemployment, the University of Pennsylvania has adopted this Code of Workplace Conduct (the Code) to promote full, productive and freely chosen employment.

The University of Pennsylvania expects its licensees to conduct their business in a manner consistent with this Code, and to follow workplace standards that adhere to this Code. The Code is subject to amendment to reflect any subsequently developed standards by the University.

II. Notice

This Code shall apply to all trademark licensees of the University of Pennsylvania. Throughout this Code the term "licensee" shall include all persons or entities that have entered a written licensing agreement with the University to manufacture products bearing the name, trademarks and/or images of the University. Additionally, this Code shall apply to all of the licensee's contractors. Throughout this Code the term "contractor" shall include each contractor, subcontractor, vendor or manufacturer that is engaged in a manufacturing process that results in a finished product for the consumer. "Manufacturing process" shall include assembly and packaging.

As a condition of being permitted to produce and/or sell licensed products bearing the name, trademarks and/or images of the University, each licensee must comply with this Code and ensure that its contractors comply with this Code. All licensees and contractors are required to adhere to this Code; however, no licensee or contractor may represent that they have been certified as being in compliance with this Code.

III. Standards

University licensees and their contractors must operate workplaces that adhere to the following minimum standards and practices:

A. Legal Compliance

University licensees and their contractors must comply, at a minimum, with all applicable legal requirements of the country in which products are manufactured. Where this Code and the applicable laws of the country of manufacture conflict or differ, the higher standard shall prevail. Such compliance shall include compliance with all applicable environmental laws.

B. Ethical Principles

Licensees shall commit to conducting their business according to a set of ethical standards that include, but are not limited to, honesty, integrity, trustworthiness and respect for the unique intrinsic value of each human being.

C. Environmental Compliance

Licensees and their subcontractors will be committed to the protection of the local environment, including their factories and their surroundings. They will protect residential areas around their factories, disposing of garbage and waste in such a way so as not to endanger the safety and health of nearby areas.

D. Employment Standards

1. Wages and Benefits

Licensees and their contractors must provide wages and benefits that comply with all applicable laws and regulations and that match or exceed the local prevailing wages and benefits in the relevant industry, whichever provides greater wages and benefits. The University is strongly committed to the employees of licensees receiving a "living wage."

2. Hours of Work

a. Except in extraordinary circumstances, or as required by business necessity, employees shall not be required to work (regardless of location) more than the lesser of:

- i. forty-eight (48) hours per week and twelve (12) hours of overtime; or
- ii. the limits on the regular and overtime hours allowed by the law of the country.

iii. In addition to their compensation for regular hours of work, employees shall be compensated for overtime hours at such a premium rate as is legally required in that country, but not less than at a rate equal to their regular hourly compensation rate.

b. Employees shall be entitled to at least one day off in every seven (7) day period.

3. Homework

The employer must ensure that work not done at the place of manufacture is performed in a manner safe for the employee and any persons who may be in the surrounding vicinity.

4. Child Labor

Licensees and their subcontractors shall not employ any person younger than 15 (or 14 where the law of the country of manufacture allows) or younger than the age for completing compulsory education in the country of manufacture where such age is higher than 15. Young workers will not be forced to work overtime hours that would prevent them from attending school. Licensees agree to work with governmental, human rights and non-governmental organizations as determined by the University and licensee to minimize the negative impact on any child released from employment as a result of enforcement of this code.

5. Forced Labor

Licensees and their subcontractors shall not use any forced labor, whether in the form of prison labor, indentured labor, bonded labor or otherwise.

6. Harassment or Abuse

Licensees and their subcontractors shall treat every employee with respect and dignity. Licensees and their subcontractors will not subject any employee to any physical, sexual, psychological or verbal harassment or abuse.

7. Nondiscrimination

Licensees and their subcontractors will not subject any person to any discrimination in employment, including hiring, salary, benefits, advancement, discipline, termination or retirement, on the basis of gender, race, religion, age, disability, sexual orientation, pregnancy, marital status, nationality, political opinion or political affiliation, union involvement or social or ethnic origin. Because, historically, the overwhelming majority of workers in light industry are women, assuring and safeguarding women's rights is of particular importance for all parties.

a. Women workers will receive equal remuneration for comparable work, including benefits, equal treatment, equal evaluation of the quality of their work and equal opportunity to fill all positions as male workers.

b. Pregnancy tests will not be a condition of employment, nor will they be demanded of employees. Workers will not be forced or pressured to use contraception.

c. Women who take maternity leave will not, because of the maternity leave, face dismissal or threat of dismissal, loss of seniority or reduction of wages. Licensees must permit women returning from maternity leave to return to their prior position or comparable position at least at their prior wage rate and benefits. Local laws and regulations, or the prevailing practice in the relevant industry, whichever is greater, shall determine appropriate length of maternity leave.

d. Licensees and their subcontractors shall provide, to the extent required by applicable law and regulations, or the local prevailing practice in the relevant industry, whichever is greater, services and accommodations to pregnant women, including but not limited to access to legally required health care provided by the employer, government or other provider.

8. Health and Safety

Licensees and their contractors must provide workers with a safe and healthy work environment free from recognized hazards and must, at a minimum, comply with local and national health and safety laws. If resi-

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dential facilities are provided to workers, they must be safe and healthy facilities. Workers will not be exposed to conditions that may endanger their reproductive health without their informed consent.

9. Freedom of Association

Licensees and their contractors shall recognize freedom of association and collective bargaining with bargaining representatives of their own choice. No employee shall be subject to harassment, intimidation or retaliation as a result of his or her efforts to freely associate or bargain collectively.

IV. Compliance

Prior to the date of annual renewal of a license agreement, the licensee shall be required to provide the following to the University, as set forth in the license agreement.

A. The Company names, owners and/or officers, and addresses, phone numbers, e-mail addresses and the nature of the business association of all the licensees' contractors and manufacturing plants that are involved in the manufacturing process of items that bear, or will bear, the name, trademarks and/or images of the University;

B. Written assurances that it and its contractors adhere to this Code (except that in the initial phase-in period, licensee must provide such written assurances within six months of receipt of this Code); and

C. A summary of the steps taken, and/or difficulties encountered, during the preceding year in implementing and enforcing this Code at each site.

Licensees and/or their contractors are responsible for conducting regular inspections of each facility at which University products are manufactured to ensure workplaces are free from recognized hazards as established in consensus standards as well as hazards as defined by local law.

V. Remediation

If the University determines that any licensee or contractor has failed to remedy a violation of this Code, the University reserves the right to terminate its relationship with any licensee in accordance with the terms set forth in the licensee agreement.

VI. Public Disclosure

A. The company names, owners and/or officers, addresses, and nature of the business association, including the steps performed in the manufacturing process, of all the licensees' contractors and manufacturing plants that are involved in the manufacturing process of items that bear, or will bear, the name, trademarks and/or images of the University shall be made public information.

B. The licensee shall be required to supply each year a list of all factory locations referred to in paragraph A above, and all locations licensee anticipates will be used during the term of the license. Any additions to or deletions from this list shall be reported to the University within two months of the effective date of such addition or deletion.

VII. Monitoring and Oversight

The President will establish a Committee on Manufacturer Responsibility ("the Committee") on the implementation of the University's Code of Conduct.

A. Composition and Selection

1. Voting Members

a. Three members of the University faculty selected by the President in consultation with the chair of the Faculty Senate, one of whom will chair the Committee.

b. Four members of the student body, including two representatives chosen by the Civic House, and one undergraduate and one graduate student, to be chosen by the Undergraduate Assembly (UA) and the Graduate and Professional Student Assembly (GAPSA), respectively.

c. One representative of University staff selected by the Penn Professional Staff Assembly (PPSA) and the Weekly Paid Professional Staff Assembly (WPPSA), respectively.

2. Ex-Officio Members (non-voting)

a. Representative of Business Services

b. Representative of the Office of the President

c. Representative of the Office of the Provost

d. Member of the Office of the General Counsel

e. Representative of the Office of the University Secretary

An administrative staff person and a work-study intern will staff the Committee. The intern will be appointed by the Committee and paid by the President's Office. The administrative staff person will be appointed by the President's Office.

The division of responsibilities will be as follows:

1. Staff Person: The administrative staff person will act as a liaison between the Committee and the Office of the President to ensure timely implementation of all decisions of the Committee. The staff person will also send out notices for Committee meetings to ensure maximum participation, and work closely with the intern to coordinate all Committee-related administrative tasks.

2. Intern: The intern will, to the best of his/her abilities, research the University's licensees in order to recognize violations of the Code. This responsibility will include the compilation of a list of licensees and the maintenance of any relevant records necessary to enforce the Code, including information received from monitoring organizations about licensees for consideration by the Committee. The intern will also actively work on developing mechanisms with other campuses who have signed Codes of Conduct to improve the effectiveness and efficiency of the Codes.

B. Decision-Making

A simple majority of the Committee must be present for the vote to take place, with at least one student, one faculty member and one staff member present. Only members who are present may vote, and decisions will pass by majority rule.

C. Meeting Schedule

The Committee will meet no fewer than two times each semester.

D. Responsibilities

1. Reviewing the Code of Conduct

The Committee will review the Code annually to evaluate its effectiveness. Amendments to the code must be submitted to the Committee for its approval.

2. Review Effectiveness of Monitoring

The Committee will review, at least annually, the effectiveness of the organization(s) conducting monitoring to ensure compliance with this Code and take appropriate steps to ensure effective monitoring.

3. Reviewing the State of Compliance

Licensees will be reviewed every six months for the first two years of their license agreement, and on an annual basis in subsequent years.

4. Reviewing Violations

The Committee will review any alleged violations of the University's Code of Conduct including consulting with monitoring organizations, such as the Fair Labor Association (FLA) and the Workers Rights Consortium (WRC), and determine whether they constitute violations. Based on this judgment, the Committee will recommend an appropriate course of action to the Trademark Licensing Unit. At the same time, should Trademark Licensing Unit identify any alleged violations, the department will consult with the Committee on an appropriate course of action.

E. Public Accountability

1. The Office of the Secretary will publish the University's Code of Conduct annually and amendments as necessary in *Almanac*.

2. The Trademark Licensing Unit will make available to any interested persons information regarding licensees' working conditions, monitoring reports and other relevant materials.

3. The Committee will work with other schools and interested organizations to improve responsible business practices in the manufacture of licensed University products.

F. Seeking and Rewarding Responsible Business Practices

1. The Committee will work with the Trademark Licensing Unit to seek out manufacturers that have instituted proactive measures to insure the responsible production of goods and give them preference by encouraging the University to consider doing business with them, taking into consideration competitive price, quality and style.

2. Through the efforts of the Committee in seeking out manufacturers with demonstrated responsible business practices, the University commits itself to giving preference to those with responsible monitoring policies, particularly manufacturers that agree to sign disclosure agreements with the University, taking into account competitive price, quality and style. Representatives of departments responsible for purchasing University products will keep in regular contact with the Committee.

So You Wanna Be an Archaeologist?

This year, Penn Museum is one of more than 100 collaborating organizations from across the United States and Canada participating in International Archaeology Day with special activities to raise public awareness of archaeology locally and nationally. Penn Museum will offer behind-the-scenes lab tours, talks on current research and mummification workshops. The special day also includes archaeological site simulations, a 3-D printing demonstration and Q&A sessions with researchers and conservators on *Saturday, October 17*, from 11 a.m.-4 p.m. The family-friendly program, *So You Wanna Be an Archaeologist?*, highlights the training and technology used by archaeologists, presented against a backdrop of mummies, ancient skeletons, clay tablets and other artifacts from the museum's collection.

So You Wanna Be an Archaeologist? is co-sponsored by the Philadelphia Society of the Archaeological Institute of America and is free with Museum admission. Activities include:

Bones, Botany, Ceramics and Metal—Inside CAAM: The Center for the Analysis of Archaeological Materials: guests can meet expert instructors mentoring archaeology students through CAAM, a multi-million dollar set of teaching labs that opened in 2014 (*Almanac* September 30, 2014). Behind-the-scenes CAAM tours will depart every 15 minutes beginning at 1 p.m.

In the ceramics lab, guests will have an opportunity to examine thin slices of pottery under a polarizing light microscope as Marie-Claude Boileau, ceramics expert, explains which clues identify where pottery objects were crafted and traded.

Archaeobotany teaching specialist Chantel White will discuss how prehistoric humans prepared ancient plants for their daily meals and how grapes were fermented into wine nearly 5,000 years ago.

Skeletons of modern animals can be seen in the zooarchaeology lab, where Mainwaring Teaching Specialist Kate Moore will lead guests in a skeletal analysis exercise to decipher ancient relationships between animals and humans.

Archaeometallurgy teaching specialist Moritz Jansen will explore how reflected light microscopy can be used to reconstruct ancient metalworking technologies.

Physical anthropology curator Janet Monge will share how forensic anthropologists use the anatomy and microstructure of human bone as clues in restoring a skeleton's "personhood."

Stories Behind the Discoveries: Record-keeping is essential for archaeologists, who document everything they find by means of notes, drawings and photographs. Since 1887, the Penn Museum has sent more than 300 field expeditions around the world. A special *Records of the Archaeologist* session of the Museum's weekly *Unearthed in the Archives* presentation will showcase the many types of records created and acquired over the years, including glass plate negatives, watercolors and even phonograph records, starting at 1 p.m.

C. Brian Rose, Ferry Curator-in-Charge of the Mediterranean Section, will greet guests in a pop-up Q&A session at 2 p.m.



2015 National Drug-Free Work Week: October 12-17

Because the University of Pennsylvania values the health and safety of the entire community, Penn is committed to maintaining a drug-free workplace year-round. Drug and alcohol abuse can harm not only the person using these substances, but also his or her family, friends and coworkers. During National Drug-Free Work Week, from *October 12-17*, please take the time to review the University's drug and alcohol policies.

Penn's Drug and Alcohol Policies

Penn prohibits the unlawful manufacture, distribution, dispensation, sale, possession or use of any drug by its employees in the workplace. Complete policy details are available online:

Drug-Free Workplace Policy:

<http://www.hr.upenn.edu/myhr/resources/policy/performance/drugfreeworkplace>

The University Alcohol and Drug Policy:

<http://www.vpul.upenn.edu/alcohol/policy2.php>

Understanding Addiction

Addiction is a serious disease, but many effective treatments are available. Visit the Penn Behavioral Health website at <http://www.pennbehavioralhealth.org/resources-addictions.aspx> for facts and information about addiction, recovery and support services.

Help is Here

If you or a family member has a substance abuse problem, we encourage you to seek help. Penn provides free, confidential counseling services for you and your immediate family members through the Employee Assistance Program (EAP). The EAP will assist you with challenges that may interfere with your personal or professional life, including substance abuse.

For more information about the EAP's counseling and referral services, visit the Employee Assistance Program web page at <https://www.hr.upenn.edu/myhr/worklife/healthy/eap> or contact the Employee Assistance Program 24 hours a day, 7 days a week at (888) 321-4433.

6th Annual Penn Safety Fair: October 22



Several vendors will also be there with a variety of safety products to try out.

Participate in safety games for a chance to win prizes.

Environmental Health & Radiation Safety

- Industrial Hygiene
- Biosafety
- Ergonomics
- Radiation Safety
- Hazardous Waste
- Safety Training
- Shipping Hazardous Goods

Division of Public Safety

- Penn Public Safety
- Fire & Emergency Services
- AlliedBarton Security
- Special Guest: FBI Representative

Penn Offices and Departments

- Office of Research Services
- Green Campus Partnership
- IACUC
- IBC (Institutional Biosafety Committee)
- ULAR

Vendors

- Curtis Bay Medical Waste Services
- ergoGENESIS
- Fisher Scientific
- Kenteck Corporation
- Kimberly Clark Professional
- Showa Best Gloves

Public Safety and the Office of Environmental Health and Radiation Safety (EHRS) invite the Penn staff to join them as they celebrate Superheroes of Safety.

Representatives from around Penn will be present to answer questions about office ergonomics, personal safety, gender inequity, recycling, proper PPE, laboratory waste, rDNA registrations, training compliance, animal protocols, dangerous goods shipments, export controls and more. The event will take place on *Thursday, October 22*, from 10 a.m.-1 p.m., in the Singh Center for Nanotechnology Lobby at 3205 Walnut Street. Take LUCY to the Safety Fair; see universitycity.org/lucy for more information.

Models of Excellence Award Nominations Due by October 29

If you want to recognize the exemplary work of a staff member or team by nominating them for a 2016 Models of Excellence award, you must act soon. *Nominations for the 2016 Models of Excellence awards are due by Thursday, October 29.* Visit <https://www.hr.upenn.edu/models> for the online nomination form and details about the nomination process.

The Models of Excellence award program celebrates the extraordinary achievements of full- and part-time staff members from across the University's schools and centers. Awards are given in three categories:

- **Models of Excellence Award**—Recognizes staff member accomplishments that reflect initiative, leadership, increased efficiency and a deep commitment to service.
- **Model Supervisor Award**—Honors supervisors who contribute to Penn's success.
- **Pillars of Excellence Award**—Celebrates the important work that weekly-paid staff members do to promote Penn's success.

All nominees receive a certificate of appreciation for their service. Models of Excellence, Pillars of Excellence and Model Supervisor winners each receive \$500 and a symbolic award. Nominees selected for honorable mention receive \$250 and a symbolic award. Awards will be presented at the Models of Excellence ceremony on *March 30, 2016* in Irvine Auditorium.

Visit <https://www.hr.upenn.edu/models> for more information about the Models of Excellence program, or contact Human Resources at models@hr.upenn.edu or (215) 898-1012 if you have questions.

—Division of Human Resources

Update

October AT PENN

READINGS AND SIGNINGS

14 *Caught: The Prison State and the Lockdown of American Politics*; Marie Gottschalk, political science; 5:30 p.m.; Penn Bookstore (Africana Studies; Penn Bookstore).

20 *We Are Who We Say We Are: A Black Family's Search for Home Across the Atlantic World*; Mary Frances Berry, history & Africana studies; 6 p.m.; Penn Bookstore (Africana Studies; Penn Bookstore).

TALKS

15 *Kids These Days: Supply and Demand for Youth Online Political Engagement*; Jennifer Earl, University of Arizona; 4:30 p.m.; Silverstein Forum, Stiteler Hall (Penn Program on Democracy, Citizenship and Constitutionalism).

16 *Cocaine Blunts and Comic Books: The Woman who Launched the Japanese Hip-Hop Scene/Is the News Dead?*; Dexter Thomas, Cornell University; noon; rm. 500, The Annenberg School for Communication (Annenberg School).

21 *Social Etiquette and Leadership*; Chuck Brutsche, Fox Leadership; 5 p.m.; Leadership Hall, 3814 Walnut Street; RSVP: <https://foxleadership.upenn.edu/> (Fox Leadership).

22 *Structural Competency: New Directions in Medical Training*; Jonathan Metzl, Vanderbilt University; noon; rm. 329-A, Max Kade Center (Africana Studies).

AT PENN Deadlines

The October AT PENN calendar is online at <http://www.upenn.edu/almanac>. The deadline for the November AT PENN calendar is today.

Info. is on the sponsoring department's website; sponsors are in parentheses. For locations, call (215) 898-5000 or see www.facilities.upenn.edu

Celebrating Farm Life: October 18

On Sunday, October 18 from noon-4 p.m., visitors are invited to celebrate farming life, past and present at Bloomfield Farm Day. This is a chance to learn about Bloomfield Farm's rich agricultural history with a guided tour of the Arboretum's historic creek-side flour mill, Springfield Mills. The one-ton millstones will grind corn kernels while the 160-year-old machinery transports and sifts the ground corn to produce meal. The new *Trees on Trial* tour led by Arboretum guides will be available, and visitors can discover current research projects conducted on the farm property. In addition to tours, there will be demonstrations, vendors, music and a few animals commemorating Bloomfield Farm's agricultural history.

Time-honored farming professions, such as spinning and weaving, will be demonstrated by educational instructors, *Philadelphia Guild of Handweavers*. Other craftsmen exhibits that are new this year include woodworker John Barrett and blacksmith Solomon Matisoff.

Guests may create a sweet-smelling apple pomander or try their hand, and all their arm muscles, at making butter the old fashioned way. Kids and adults will learn about farm animals by interacting with Saul High School's 4H petting zoo.

Hot food and beverages from the Compton Café will be available, along with the sweet sounds of Valley Creek's bluegrass music. Also on site from 1-3 p.m. will be Yards Brewing Company with a variety of flavorful beer samples and fun giveaways.

Take advantage of this rare opportunity to glimpse a different time with a short trip to Bloomfield Farm, located across the street from the Arboretum's main entrance on Northwestern Avenue. This event is free with regular garden admission.

For more information call (215) 247-5777 or visit www.morrisarboretum.org



OCTOBER 5 – NOVEMBER 20

Penn's Way 2016 Raffle Prizes Week 3 (10/27 drawing)

Penne Restaurant & Wine Bar: \$75 gift certificate

Annenberg Center for the Performing Arts: Two tickets to any performance

Longwood Gardens/The Rose Group: Two tickets to Longwood Gardens & \$25 gift certificate to Applebee's

Shake Shack: \$40 gift card

Doc Magrogan's Oyster House: Cheerful Basket \$100

SSM Group: Padfolio w/\$25 restaurant gift card

Philip Rosenau Company: \$50 iTunes gift card

Q: How much should I give?

A: As much as you can afford to give. If you have contributed through Penn's Way in years past, please consider matching your previous gift or increasing it by 2-3% to keep pace with inflation. If this will be your first time contributing through Penn's Way, please consider donating as little as \$1 per biweekly pay or \$2 per monthly pay. We welcome donations of all sizes.

Q: Will my contribution via payroll deduction occur pre- or post-tax?

A: All contributions made via payroll deduction will be deducted after taxes.

Visit the Penn's Way website for more information about what a gift can provide, pledge forms, a payroll deduction guide, an agency list and more frequently asked questions & answers: <http://www.upenn.edu/pennsway/>

Almanac

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The University of Pennsylvania's journal of record, opinion and news is published Tuesdays during the academic year, and as needed during summer and holiday breaks. Its electronic editions on the Internet (accessible through the Penn website) include HTML, Acrobat and mobile versions of the print edition, and interim information may be posted in electronic-only form. Guidelines for readers and contributors are available on request and online.

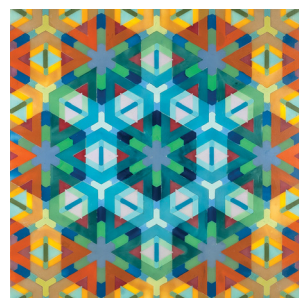
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MathThematic at Esther Klein Gallery through November 20

MathThematic: a fine art exhibition features 16 artists of all media demonstrating mathematic evidence in art, whether the works are directly inspired by math (geometry, fractals, patterns, etc.) or if the mathematical principles emerge naturally and reveal themselves from our human predisposition towards order. *Ruche 0352.32* by Karen Freedman (at left) is on view.

The exhibition is taking place at the Esther Klein Gallery in the Science Center through November 20. An opening reception is scheduled for tomorrow, *Wednesday, October 14* from 5-7:30 p.m. Gallery hours are Monday-Saturday, 9 a.m.-5 p.m.

The University of Pennsylvania Police Department Community Crime Report

About the Crime Report: No Crimes Against Persons or Crimes Against Society were reported for **September 28-October 4, 2015**, although 13 Crimes Against Property (8 thefts, 2 auto thefts, 2 frauds and 1 other offense) were reported. Full reports are available at: www.upenn.edu/almanac/volumes/v62/n09/creport.html. Prior weeks' reports are also online. —Eds.

This summary is prepared by the Division of Public Safety and includes all criminal incidents reported and made known to the University Police Department between the dates of **September 28-October 4, 2015**. The University Police actively patrol from Market Street to Baltimore Avenue and from the Schuylkill River to 43rd Street in conjunction with the Philadelphia Police. In this effort to provide you with a thorough and accurate report on public safety concerns, we hope that your increased awareness will lessen the opportunity for crime. For any concerns or suggestions regarding this report, please call the Division of Public Safety at (215) 898-4482.

09/28/15	6:39 PM	3935 Walnut St	Complainant slapped by co-worker
10/01/15	12:23 PM	3609 Chestnut St	Complainant verbally threatened by male
10/02/15	11:08 AM	3900 Chestnut St	Confidential sex offense
10/02/15	3:55 PM	3160 Chestnut St	Harassing messages received
10/03/15	11:53 PM	3900 Spruce St	Cell phone and ID taken/Arrest

18th District Report

Below are the Crimes Against Persons from the 18th District: 4 incidents with 1 arrest (2 assaults and 2 robberies) were reported between **September 28-October 4, 2015** by the 18th District covering the Schuylkill River to 49th Street & Market Street to Woodland Avenue.

09/28/15	7:15 PM	3935 Walnut St	Assault
09/29/15	6:47 PM	48th & Locust St	Assault
10/04/15	12:54 AM	3900 Spruce St	Robbery/Arrest
10/04/15	7:55 PM	4424 Osage Ave	Robbery

Twitter Behavior Can Predict Users' Income Level, New Penn Research Shows

The words people use on social media can reveal hidden meaning to those who know where to look.

Linguists have long been fascinated by this notion, connecting a person's words to age, gender or even socioeconomic status. Now computer scientists from the University of Pennsylvania and elsewhere have gone a step further, linking the online behavior of more than 5,000 Twitter users to their income bracket. They published their results in the journal *PLOS ONE*.

Daniel Preotiuc-Pietro, a post-doctoral researcher in Penn's Positive Psychology Center in the School of Arts & Sciences, led the research, collaborating with Svitlana Volkova of Johns Hopkins University, Vasileios Lampos and Nikolaos Aletras of University College London and Yoram Bachrach of Microsoft Research.

The team took an opposite approach to what psychologists and linguists have historically done: rather than asking direct questions, the scientists looked at participants' social media posts, often full of intimate details despite the lack of privacy these outlets afford. Researchers from Penn's World Well-Being Project, of which Dr. Preotiuc-Pietro is a part, are curious about social media as a research tool that can support or even replace expensive, limited and potentially biased surveying.

For this experiment, the researchers started by looking at Twitter users' self-described occupations.

In the United Kingdom, a job code system sorts occupation into nine classes. Using that hierarchy, the researchers determined average income for each code, then sought a representative sampling from each. After manually removing ambiguous profiles—for example, listings referencing the film *Coal Miner's Daughter* grouped as “coal miner” for profession—the team ended up with 5,191 Twitter users and more than 10 million tweets to analyze.

“It's the largest dataset of its kind for this type of research,” said Dr. Preotiuc-Pietro. “The dataset enabled us to do something no one has really done before.”

From there, they created a statistical natural language processing algorithm that pulled in words that people in each code class use distinctly. Most people tend to use the same or similar words, so the algorithm's job was to “understand” which were most predictive for each class. Humans analyzed these groupings and assigned them qualitative signifiers.

Some of the results validated what's already known, for instance, that a person's words can reveal age and gender, and that these are tied to income. But Dr. Preotiuc-Pietro said there were also some surprises; for example, those who earn more tend to express more fear and anger on Twitter. Perceived optimists have a lower mean income. Text from those in lower income brackets includes more swear words, whereas those in higher brackets more frequently discuss politics, corporations and the nonprofit world.

Dr. Aletras noted an overall picture that emerged about Twitter use.

“Lower-income users or those of a lower socioeconomic status use Twitter more as a communication means among themselves,” he said. “High-income people use it more to disseminate news, and they use it more professionally than personally.”

Strong correlations like these, between what the researchers describe as online expression and offline demographics—for example, occupation grouping or income level—also proved intriguing, Dr. Lampos added. “This work attempts to highlight some of the potential causal factors in these relationships.”

Such findings will act as a baseline for future work, some of which will investigate how perceptions about user income align with reality.

Penn Dental Medicine Study Produces Low-cost, Shelf-stable Drug in Lettuce

Biopharmaceuticals, or drugs that are based on whole proteins, are expensive to make and require refrigeration to store. Insulin, for example, is unaffordable and inaccessible to most of the global population.

At the University of Pennsylvania School of Dental Medicine, Henry Daniell and colleagues have been working to overcome these obstacles by using a plant-based system to make shelf-stable drugs. In a study published in the journal *Biomaterials*, the researchers confirmed the viability of their method for FDA approval and human use, producing an effective drug that promotes tolerance to clotting factors, which could be taken by hemophilia patients, using freeze-dried lettuce leaves.

This is the first time a group has shown the commercial viability of producing a low-cost drug made from whole plants. “This is a milestone in our field, to make a fully functional drug in plants, produce it at a large scale and in quantities sufficient for human clinical trials,” Dr. Daniell said.

Dr. Daniell, professor and interim chair in Penn Dental Medicine's department of biochemistry, is senior author on the study. Collaborators

from the University of Florida, led by Roland Herzog, conducted animal studies. Fraunhofer USA's Steve Streatfield facilitated large-scale production of lettuce in the company's FDA-compliant facility.

The study builds on previous work by Dr. Daniell's group demonstrating an ability to use genetically modified plants to introduce a protein into the body that would teach the immune system to tolerate clotting factors that are given as a treatment for hemophilia.

Normally, 20 to 30 percent of people who get infusions of clotting factor develop antibodies against them that interfere with treatment. The earlier study, published in the journal *Blood*, successfully stopped and even reversed the production of these clotting factor inhibitors by feeding the plant-based drug to mice with hemophilia A. That study used a tobacco plant platform to “grow” the drug. To take this approach into humans, however, Dr. Daniell's team knew they needed to use a different plant species.

They launched work with lettuce, which required using a completely different genetic vector to introduce the therapeutic gene into the plant cell's DNA, as the tobacco construct would not work in a different species. After identifying a compatible vector, they used a similar protocol to their previous work, bombarding lettuce leaves with a fusion of the therapeutic protein, coagulation factor IX, or FIX, with cholera toxin B subunit, which allows the protein to reach the immune system. They then evaluated the resulting plants for those that took it up and then grew those plants to maturity.

The next step was to ensure that the drug would be shelf stable. To do that, they freeze dried the plant material, ground it and analyzed the resulting fine powder for expression levels of the fusion protein to determine the appropriate dose and to evaluate its efficacy.

Similar to their previous experiments, Dr. Herzog's lab fed hemophilia B mice with a suspension of plant cell containing clotting factor IX twice a week for eight weeks and then gave them the same clotting factor that human hemophilia patients take to encourage blood clotting. As before, their product was a success: mice given the drug had greatly suppressed inhibitor formation compared to untreated animals, even when various doses of the drug were tested.

“One of the key findings of our study was that we found our drug was efficacious across at least a 10-fold dose range,” Dr. Daniell said.

Such flexibility is important for translation of the drug to humans, as there may be individual variations in how a drug is metabolized in the gut as plant cells are broken down by commensal bacteria.

In the work, the researchers used two different growing systems. One was in the greenhouse on Penn's Pennovation Works campus, a high-tech facility that grows the plant in soil and uses natural light. The second was the Fraunhofer USA facility, which more closely replicates how a commercial pharmaceutical production facility would run, using a hydroponic system and artificial lighting.

“Despite the fact that plants in the greenhouse were receiving 50 times more light, the Fraunhofer yield was quite close to ours and quite good,” Dr. Daniell said. “In 1,000 square feet, they could produce 36,000 doses.”

A hydroponic system could also easily be scaled up by adding racks and thus using vertical space, which a traditional greenhouse could not do. The researchers were able to harvest a new batch of pharmaceutical-containing lettuce every four to six weeks.

With this study, which confirms the viability of a plant-based biopharmaceutical production on a commercial scale, the researchers have eliminated several expensive obstacles that hamper the development of affordable traditional protein drugs. The method requires no fermenter, no purification to ensure sterility and no cold chain to keep the drug refrigerated. In addition, the researchers found that their capsules remained potent and effective for two years, ensuring the product is shelf-stable and patients could theoretically take the drug from home.

“Not only did we show a truly translational result for helping hemophilia patients,” Dr. Daniell said, “but this also changes the way we think about delivering protein-based drugs to human patients.”

“Current treatments for inhibitor formation in hemophiliacs cost almost a million dollars and are not affordable for a significant segment of the patient population,” he said, “but the new drug is dramatically cheaper and may offer even a better solution for treating hemophilia patients. Most important, developing a low cost platform for protein drug delivery will make these drugs affordable for a large majority of the global population.”

Additional authors on the study included Aditya Kamesh, also from Penn Dental Medicine; co-lead author Liqing Zhu, Alexandra Sherman, Xiaomei Wang and Roland W. Herzog from the University of Florida; and Joey H. Norikane and Stephen J. Streatfield from Fraunhofer USA.

Large-scale production was supported by Novo Nordisk and basic science was supported by two NIH grants. A short-term exchange student fellowship to Dr. Zhu was provided by the National Nature Science Foundation of China.