Manhattanville in West Harlem Implementation Plan Report October 17, 2016 Submission

Declaration Reference and Key Data

Obligation Section Number: **5.07(c)(xi)** Obligation Title: **Youth Internships** Obligation Page Number: **55** Obligation Trigger: **2010** Obligation Start Date: **Summer 2010** Obligation End Date: **2025** Obligation Status: **In Compliance**

Obligation

Youth Internships. Commencing in 2010, CU shall create a pilot program for up to 15 summer internships per year for high school students with one-third selected from the local community and two-thirds from the upper level students at the School to support academic and research interests of students. The program shall begin with five students from the local community and add 10 students from the new School when students reach the upper grades and qualify for such an internship. The internships shall initially take place in CU's existing facilities and shall move to the new Academic and Academic Research buildings proposed within the Project Site when constructed. After five years the program shall be reviewed by leadership of the School and CU with the intent of modifying, extending the size and/or renewing the program upon mutual agreement.

* Following the summer 2014 internship program, CU met with the principal of the school and developed the modifications described below.

Five Year Review and Modifications:

Following the initial five years and in coordination with the School's leadership, CU has modified the internship program to focus on at least one aspect of Science, Technology, Engineering, Environment, Arts and/or Math (STEAM) and basic office etiquette. Working with various units within the University, the modified internship program will include the following adaptations:

New Title: Youth Internships

Timeframe: No longer limited to summer weeks.

Program Duration: Varies. Internships can range from 4 weeks to 9 months depending upon the specific program. Number of Interns: No fewer than 15 internships comprised of CSS students and/or local community students. Internship Locations: Within Columbia University offices and laboratories

Program Description: CU shall provide no fewer than 15 high school students attending the Columbia Secondary School for Math, Science and Engineering and/or living within the Local Area an opportunity to participate in one of several youth internship programs operated by Columbia University focusing on math, science, engineering and/or the environment/sustainability. Internship programs vary and are managed by departments, schools and other offices within the University. The internships will be located on the University's campuses.

At the end of 2018, the Internship Program will be reviewed in consultation with ESD with the intent of modifying and/or renewing the program.

Evidence of Compliance

1. Annual report

Manhattanville in West Harlem Implementation Plan Report October 17, 2016 Submission

Columbia University's Implementation Plan and all supporting documentation are made available on the Community Services Webpage at http://manhattanville.columbia.edu/community/benefits-and-amenities.

EOC Checklist for Obligation 5.07(c)(xi):
Please check to verify EOC items submitted for review.
1. Annual report
Monitor's Notes / Comments:
Status: Please check to indicate the status of <u>Obligation 5.07(c)(xi)</u> :
□ In Compliance
In Progress
□ Not In Compliance
□ Not Triggered

Annual Report: Youth Internships

State Submission Annual Reporting Period: October 2015 - September 2016

- BRAINYAC Information Session Date: October 24, 2015
- Engineering the Next Generation Information Session Dates: March 15, 2016 and March 31, 2016

• BRAINYAC Application Deadlines: November 20, 2015 (Lang Program and Columbia Secondary School) and November 23,

- 2015 (State Pre-College Enrichment Program and Double Discovery Center)
- Engineering the Next Generation Application Deadline: April 15, 2016

Following the initial five year Summer Internship Program and in coordination with Columbia Secondary School's leadership, CU modified the internship program to provide a more selective internship to focus on at least one aspect of Science, Technology, Engineering, Environment, Arts and/or Math (STEAM).

The BRAINYAC program (Brain Research Apprenticeships In New York At Columbia) admits students with a stated interest in biomedical and specifically neuroscience research and provides immersive science research experience with Zuckerman Institute scientists. The program prepares students for laboratory research through training sessions, which run from January through May, followed by a 6-week period of intensive research during the summer. Upon completing the program, students come away with an increased understanding of how research in the lab leads to transformative discoveries. The program admits from four partner programs; Lang Youth Medical Program, State Pre-College Enrichment Program (S-PREP), Columbia Secondary School and the Double Discovery Center.

The Engineering the Next Generation (ENG) Program is a 6-week long intensive summer program at Columbia Engineering for academically competitive high school students. Rising high school seniors are placed in engineering labs, matched with research mentors, and supervised by faculty members Program components inclure research, menotring, college preparation, presentation skills, as well as academic and professional workshops. Students are challenged with high-level academic expectations of both the researchers and undergraduate mentors. The program admits from three partner schools; Columbia Secondary School, The High School for Math, Science and Engineering (HSMSE) at the City College of New York, and ELLIS Preparatory Academy.

For both BRAINYAC and Engineering the Next Generation, participants must be at least 16 years of age in order to participate and are granted a stipend for their time in the program.

	Program	Intern Name	Zip Code	High School
1.	BRAINYAC		11385	Columbia Secondary School
2.	BRAINYAC		10031	Columbia Secondary School
3.	BRAINYAC		10033	Columbia Secondary School
4.	BRAINYAC		10033	Columbia Secondary School
5.	BRAINYAC		10014	Columbia Secondary School
6.	BRAINYAC		10040	Columbia Secondary School
7.	BRAINYAC		10032	Thurgood Marshall Academy for Learning and Social Change
8.	BRAINYAC		10034	Bronx High School of Science
9.	ENG		10035	Columbia Secondary School
10.	ENG		10034	Columbia Secondary School
11.	ENG		10034	Columbia Secondary School
12.	ENG		10032	Columbia Secondary School
13.	ENG		10025	Columbia Secondary School
14.	ENG		10452	Columbia Secondary School

Additional Supporting Documentation

- BRAINYAC Brochure
- BRAINYAC Partner Program Recruitment Letter
- BRAINYAC 2016 Application Packet
- BRAINYAC 2016 Poster Presentation Program
- ENG Outreach and Application Process
- ENG 2016 Application Packet

Student Eligibility

BRAINYAC admits students from four local youth-serving programs and schools who have a stated interest in biomedical research and related careers. Students commit to Saturday afternoon classes from January through April and a full-time, six-week summer internship that runs from July through August.

Applicants must be:

- current sophomores or juniors;
- 16 years of age or older by the start of the summer session; and
- currently enrolled in one of the following: Lang Youth Medical Program; State Pre-College Enrichment Program (S-PREP); Double Discovery Center at Columbia College; or the Columbia Secondary School for Math Science and Engineering.



BRAINYAC scholars participate in a science communication and networking workshop.

Applicants to BRAINYAC:

- are genuinely interested in the biomedical sciences;
- demonstrate the maturity needed to work in a sophisticated high-tech lab environment; and
- are willing to commit to completing the entire program.

Preference is given to students residing in northern Manhattan and the South Bronx.

Applications are distributed to partner programs and schools in the fall before BRAINYAC begins.



Members of BRAINYAC's class of 2015.



COLUMBIA | ZUCKERMAN INSTITUTE Mortimer B. Zuckerman Mind Brain Behavior Institute

Mailing address: 615 West 131st Street 6th Floor New York, NY 10027

Phone: 212-853-0600 E-mail: brainyac@columia.edu COLUMBIA | ZUCKERMAN INSTITUTE Mortimer B. Zuckerman Mind Brain Behavior Institute

BRAINYAC Program

Brain Research Apprenticeships in New York at Columbia



The Zuckerman Institute's BRAINYAC program pairs high school students with scientists for intensive lab apprenticeships.



A BRAINYAC scholar working collaboratively with mentors and colleagues during summer research internship.

Program Overview

The Zuckerman Institute's Brain Research Apprenticeships in New York at Columbia (BRAINYAC) program is an immersive science research experience, where our scientists open their doors to high school students, who in turn bring their talents and perspectives to the lab.

The program aims to:

- introduce high school students to an academic scientific research environment;
- develop their laboratory and technical skills;
- boost their understanding of science as it is practiced; and
- build their science communication and presentation skills.

What's Involved

The BRAINYAC program starts in January through with Saturday training sessions which run through April at Columbia University Medical Center. During this time, students are prepared for laboratory research and focus on neuroscience content and basic laboratory skills.

Beginning in July, students are matched with scientists in neuroscience laboratories at Columbia University for six weeks of one-on-one mentored research.

Student employ techniques that scientist use everyday such as DNA editing, functional imaging and computer modeling.

BRAINYAC scholars also meet weekly as a group to build their science communication and presentation skills.



A BRAINYAC scholar prepares tissue using a vibratome to study how the brain processes sensory information and moves the body in response.

Outcomes



A BRAINYAC scholar presents her research about aging in the brain to peers, families and the local community members during the end-of-program poster presentations

Students come away from the program with an enhanced understanding of how lab research can lead to transformative discoveries, as well as exposure to a professional and academic environment and a heightened connection to science as a career.

At the end of the program, students present their research to a diverse audience—friends, family, researchers, mentors and the broader community — during a poster presentation.

Students are paid a stipend upon successful completion of the program.

COLUMBIA | ZUCKERMAN INSTITUTE Mortimer B. Zuckerman Mind Brain Behavior Institute

October 6, 2015

[name] [principal or other title] [Partner Program/ School] [street address] [city, state zip code]

Dear [Mr./Ms./Dr.] [name]:

The Brain Research Apprenticeship in New York at Columbia (BRAINYAC) is a mentored science research program for high school students. We are recruiting students for the BRAINYAC program and will like to invite you to nominate students whom you feel will benefit from the BRAINYAC program to apply. The program, run by Columbia University's Mortimer B. Zuckerman Institute, is designed to introduce high school students to academic scientific research environment, develop student's laboratory and technical skills, boost student's understanding of science practice and build student's science communication and presentation skills.

The BRAINYAC program's spring session runs from January through April and summer laboratory internship runs from June through August. During the spring students attend Saturday training sessions during which they learn neuroscience fundamentals and common laboratory techniques in preparation for their summer laboratory internships. Students are matched to scientist mentors in neuroscience laboratories in Columbia University for a six-week one-on-one mentored research.

We ask our select partner programs to nominate students who: are genuinely interested in biomedical sciences; have a high level of maturity needed to work in a sophisticated high-tech laboratory environment; are 16 years of age by the beginning of the summer laboratory internship on June 27, 2016; and are willing to commit to the entirety of the program.

Nominated students are required to attend a recruitment information session on **Saturday**, **October 24, 2015 from 11am to 12pm**. The information session will be held at Hammer Building Room LL210, located at 701W 168th street, New York, NY 10032. More information about the program will be shared with the students during the session.

Please feel free to contact me if you have any questions regarding the program or the application process. I can be reached via email at a second or via phone at a second or via phone at a second se

Yours sincerely,

Education Program Manager Mortimer B. Zuckerman Mind, Brain Behavior Institute Columbia University Invitation to attend

BRAINYAC Program

Information Session Saturday, October 24, 2015 11am to 12pm

> Hammer Building 701 W 168th Street, Room LL210, New York, NY 10032



COLUMBIA | ZUCKERMAN INSTITUTE Mortimer B. Zuckerman Mind Brain Behavior Institute

BRAINYAC Program Application Form 2016

Welcome to the online application for Brain Research Apprenticeships in New York at Columbia (BRAINYAC). This application consists of five parts: personal information, parent/guardian information, education, short answer, and essay guestions. We recommend that you compose your answers to the short answer and essay questions before beginning the application. You will be able to copy and paste your answers into the boxes provided. By applying to the program, you admit that you will: attend all program sessions and be accompanied by a parent or guardian to the parent-student orientation on January 9, 2016. Short answer questions: Describe any extracurricular activities (organizations, athletics, student government, etc.) in which you have participated. Include community service, if applicable. What special recognition have you received for excellence in school? Essay questions: Describe what makes you a good candidate for the BRAINYAC program. What interests you about the brain and neuroscience? (Max 300 words) How would being in the BRAINYAC program help your education and career goals? (Max 200 words) Working in a professional research lab as potentially its youngest and least experienced member can be a challenge for some people. What experiences have prepared you for being in a professional environment surrounded by adults? (Max 200 words) Please direct any questions to the BRAINYAC program director, Chidi Paige, cp2879@columbia.edu

First Name

Middle Name

Last Name

Which of the BRAINYAC partner programs or school are you enrolled in

- Lang Youth Program (1)
- O S-PREP (2)
- Double Discovery Center (3)
- O Columbia Secondary School for Science Math & Engineering (4)

Mailing Address Line 1 (Number, Street, Apt. #)

Mailing Address Line 2 (City, State)

Zip Code

Cellphone Number (If available)

Email Address

Re-type email address

Gender O Male (1) O Female (2)

Date of Birth

Will you be 16 years of age on or before June 30, 2016?(If you have not turned 16 years old by the start of the lab portion of BRAINYAC, you are ineligible to apply.)

O Yes (1)

O No (2)

Parent/ Guardian name (First and Last)

Parent/ Guardian Email Address

Home Telephone Number

Additional Parent/ Guardian Name (Optional)

Additional Parent/ Guardian Email Address (Optional)

Name of high school

Address of high school (Street number, street name, City, State, and zip code)

Current grade in school
10th grade (1)
11th grade (2)

Do you commit to attending the BRAINYAC training sessions from 1:15 to 3:15pm on the following Saturdays? January 9, January 16, January 23, January 30, February 6, February 13, February 27, March 5, March 12, April 2 and April 16 2016

• Yes (1)

• No (2)

Does your parent commit to attend the parent-student orientation on January 9, 2016 from 1:15pm to 3:15pm?

- Yes (1)
- O No (2)

Do you commit to participating in a scientific research laboratory internship and BRAINYAC advisory sessions from June 30 to August 12, 2016?

- **O** Yes (1)
- O No (2)

Describe any extracurricular activities (organizations, athletics, student government, etc.) in which you have participated. Include community service, if applicable.

What kind of laboratory experience do you have (in school or extracurricular)(No previous lab experience outside of the typical high school classes is necessary for this program.)

What special recognition have you received for excellence in school?

We will be conducting interviews on the following days and times. Please indicate your availability on at least 3 separate dates, selecting as many time slots possible on each day. Interviews will be approximately 20 minutes and be conducted at Columbia University (Studebaker Building, 615 131st Street, New York). Further details will be provided to applicants invited to interview. Due to on going constructions, please enter the building at 622 132nd Street entrance. Please hold dates you indicate below on your calendar until the week of November 24, 2015 when we will confirm your interview date.

	3:00PM to 3:30PM (1)	3:30PM to 4:00PM (2)	4:00PM to 4:30PM (3)	4:30PM to 5:00PM (4)
Monday, November 30 (1)	0	0	0	О
Tuesday, December 1 (2)	0	0	0	О
Wednesday, December 2 (3)	0	0	О	О
Thursday, December 3 (4)	0	О	О	О
Friday, December 4 (5)	0	0	0	О
Monday, December 7 (6)	0	0	0	О
Tuesday, December 8 (7)	О	О	О	О

Describe what makes you a good candidate for the BRAINYAC program. What interests you about the brain and neuroscience? (Max 300 words)

How would being in BRAINYAC program help your career goals? (Max 200 words)

Working in a professional research lab as potentially its youngest and least experienced member can be a challenge for some people. What experiences have prepared you for being in a professional environment surrounded by adults? (Max 200 words)

The information submitted above is true and correct to the best of my knowledge.

- O l agree (1)
- O I disagree (2)

I hereby submit my application to BRAINYAC program. (Name, date)

Contact Information: Education Program Manager Mortimer B. Zuckerman Mind Brain Behavior Institute615 West 131st Street, 6th FloorNew York, NY 10027 Phone:

Email:



COLUMBIA | ZUCKERMAN INSTITUTE Mortimer B. Zuckerman Mind Brain Behavior Institute

BRAINYAC Research Poster Presentation & Reception

Celebrating achievements of the 2016 BRAINYAC graduates

at

Riverview Lounge, 4th Floor Hammer Health Science Building 701 W 168th St. New York, NY 10032

Friday, August 12, 2016 2:00pm to 4:00pm



BRAINYAC 2016 graduates

The Zuckerman Institute's BRAINYAC (Brain Research Apprenticeships in New York at Columbia) program is an immersive science research experience for high school students to work in neuroscience laboratories at Columbia University.



PROGRAM Age	enda	BRAINYAC Students	
2:00pm	Guest Arrival	The eff regions	fect of social ascent on the levels of cFos in various s of the brain
	Mentor Appreciation	The ch cells of	aracterization of PARP expression in neural progenitor f the human hippocampus
	Presentation of Certificates	The ro	le of ATRX and HDAC2 in olfactory receptor choice
3:00pm—4:00pm	Refreshments and Research Poster Presentations	Investi using	gating patterns in axon guidance in the larva of fruit flies optogenetics
4:00pm	Departure	Does s	ocial status affect orexin expression in the mouse brain?
BRAINYAC Pro	ogram Description	Unders	standing and explaining autistic behaviors by testing the ng style theory
Brain Research A	apprenticeships In New York At Columbia (BRAINYAC) is	Investi	gating the functions of visceral second-order neurons
a mentored scien	ce research program for high school students run by the	Develo	ping specific connections between MN and muscles
Zuckerman Instit	tute. The program aims to introduce high school	Investi ketami	gating the role of adult hippocampal neurogenesis and ne in buffering the stress response
laboratory and te	echnical skills, boost their understanding of science as it	Functi CHO co	on and expression of dopamine transporter in HEK and ells through direct transfecting and viral transfecting
is practiced and build their communication and presentation skills.		Creatin	ng a cell culture system to study regulation of olfactory or choice
Students are pre	pared for laboratory research during eight training	Retrom	er degeneration in ALS astrocytes
sessions from Ja	nuary to April that focus on neuroscience content and	Charac	cterizing tagged versions of death receptor 6

BRAINYAC receives generous support from the Pinkerton Foundation and the Stavros Niarchos Foundation.

as a career.

basic laboratory skills. Starting in June, students spend six weeks doing mentored research in Neuroscience laboratories at Columbia. Students come away from the program with an increased understanding of science

ENG Outreach and Application Process

The ENG program was advertised primarily through in-person information sessions and presentations at partner schools in junior (11th grade) STEM classes and after-school programs. The program was also advertised on the Columbia Engineering Outreach website, but applications were only distributed through STEM teachers at our partner schools. All students with junior standing at our partner schools were eligible to apply, and teachers of junior level STEM classes were asked to encourage exceptional students in their classes to apply.

The applications were opened on March 31st, 2016 and closed on April 15th, 2016, giving students over two weeks to complete the application. The application packet (attached) included a personal information form, two essay responses, an extracurricular activities form, a teacher recommendation letter, and a high school transcript. Students submitted their applications to their STEM teachers, who then forwarded the application materials to Emily Ford by the application deadline.

Applications were evaluated by with additional input from partner school teachers, as well as SEAS faculty members. Students were evaluated for academic excellence and interest in STEM. The high school transcripts and teacher recommendation letters were used to evaluate academic excellence, and interest in STEM was assessed with the essay responses, extracurricular activities form, and teacher recommendation letters. Students were notified of their acceptance to the program or waitlist placement at the beginning of May 2016.





ENG Program: Summer Research for High School Students at Columbia University Fu Foundation School of Engineering & Applied Science

Program Description

The ENG Program is a 6-week academic summer program at Columbia Engineering for academically competitive high school students. Rising high school seniors will be placed in engineering labs, matched with research mentors, and supervised by faculty members. This program has rigorous demands and will prepare students for the caliber of work expected of college students.

Program components include research, mentoring, college preparation, presentation skills, as well as technical, academic, and professional development workshops. Students will also learn time management, communication, and teamwork skills, which are all increasingly important for success in STEM fields and in higher education. Possible extensions of the program include continuing research throughout the academic year, publication in the Columbia Undergraduate Science Journal, and a letter of recommendation from the research lab's supervising professor and Principal Investigator.

Eligibility

Students should be current high school juniors to apply. While there is no minimum GPA, students should excel academically overall. Ideally, applicants will have demonstrated interest in STEM subjects, for example by seeking out advanced classes and extra curricular activities.

Students must be free for the entire duration of the program. Students are required to present their project at the research master class, write a summary of the research project, and prepare a poster to present at the undergraduate symposium in September 2016. The program also requires students to attend a lab safety training as well as relevant workshops. Students will be awarded a stipend upon successful completion of the program.

Dates and Duration

The program runs from Tuesday July 5th through Friday August 12, 2016. Students will work about 35 hours a week, Monday – Friday from 9am – 5pm.

Application Deadline:

Please print out all materials and submit them to your teacher by <u>April 15th 2016</u> by 5:00pm EST.





Application Checklist

Please use the following checklist to verify that your application is complete prior to submitting your application. All materials, including the letter of recommendation, are due on **April 15th**.

Personal Information Form

• Student and parent signatures are required.

□ Two (2) Essay Responses

- Responses should be limited to 300 words maximum per question. For question 3, additional drawings are allowed.
- Do NOT answer all three questions. Only two essay responses will be evaluated when reviewing your application.
- Essay responses should be written/typed on a separate document attached to the completed application. Please label each page with the question you are answering.

□ Extracurricular Responses

• Please describe up to three (3) of your most important extracurricular activities on the form included.

□ Recommendation Letter

- Please ask either your current science or math teacher to submit a recommendation on your behalf. Important: Please notify your teacher well in advance of the April 15th deadline to give your teacher ample time to prepare a letter of recommendation.
- Teachers: Please email your letters of recommendation directly to Director of Outreach Programs at Columbia Engineering at

High School Transcript





	Per	<u>rsonal Informa</u>	tion Form
Applicant Information			
First Name:		M.I.:	Last Name:
Home Address:			
City:	State:	Zip:	Phone Number:
Email Address:			
Parent/Guardian Infor	mation		
Parent/Guardian 1: First	Name:		Last Name:
Email Address:			Phone Number:
Parent/Guardian 2: First	Name:		Last Name:
Email Address:			Phone Number:
Emergency Contact			
First Name:		La	st Name:
Email Address:		Cel	l Phone Number:
School Information			
Name of School:			Current Grade:
Name of teacher providir	ng recommendatio	on:	
Teacher's subject:			
Signatures			
By signing below, I verify form along with all the re	that all information of the second seco	ion provided in etailed in the ch	the application is accurate. Please submit this ecklist.

Applicant Signature:	Date:
Parent/Guardian Signature:	Date:





Essays

Please choose 2 out of the three essay questions to answer, and limit your responses to 300 words or less. There are no "right" answers to any of these questions; essays will be judged for creativity, innovation, and your ability to convey your ideas clearly and concisely. Submit your responses in a separate document along with the rest of your application, and clearly label each page with the question that you are answering.

1) What do you think has been the greatest scientific or technological discovery in the past 50 years? Why?

2) Describe a social, personal, or academic challenge that you have faced and how you overcame it.

3) Imagine that you are a product engineer for a rehabilitation clinic. Many of the clinic's patients suffer from arthritis and have difficulty doing daily tasks with their hands, such as turning a doorknob, typing on a keyboard, or opening containers. The clinic has asked you to design a product that will allow arthritis patients to do some of these tasks more easily.

Describe your plan on how you will design your solution from start to finish. To help you get started, here are a couple questions to help you begin your design plan:

- Arthritis makes numerous daily activities difficult. Which specific activity will your product make easier for arthritis patients, and why did you choose this activity?
- How will you brainstorm possible solutions?
- How will you make your product economically feasible?
- How will you test your product?

Please note that we are NOT looking for a specific solution, and you do not need to design or sketch a possible solution unless you wish. We are more interested in your approach to problem solving and design planning rather than a "correct" solution.





Extracurricular Information Form

Please list up to three (3) extracurricular activities in order of importance.

Extracurricular Activity 1

Organization:	Position/Role:	
Hours Per Week:	Start and End Date (list Present if ongoing):	
Describe your involvement and why it is important to you (100 words max):		

Extracurricular Activity 2

Organization:	Position/Role:	
Hours Per Week:	Start and End Date (list Present if ongoing):	
Describe your involvement and why it is important to you (100 words max):		

Extracurricular Activity 3

Organization:	Position/Role:	
Hours Per Week:	Start and End Date (list Present if ongoing):	
Describe your involvement and why it is important to you (100 words max):		