Celebrating the Stories of Black Cellular Biologists and the Path towards Diversity, Equity, and Inclusion in STEM

Henning Schneider, Ph.D., Professor of Biology

Nipun Chopra, Ph.D., Assistant Professor of Biology

Kenneth Brown, Ph.D., Assistant Professor of Geosciences

Scott Stetson, MAT, Charitable Gifts Officer

Wendy Tomamichel, B.A., Biology Laboratory Manager

Rebecca Kinney, Administrative Assistant, Biology Department

Valerie O'Hair, Assistant Director of Sponsored Research and Institutional Grants

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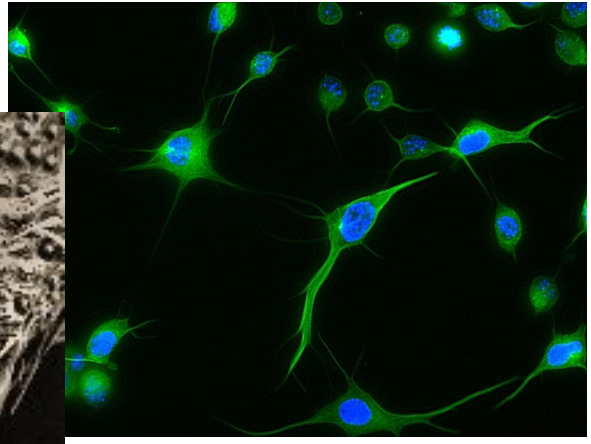
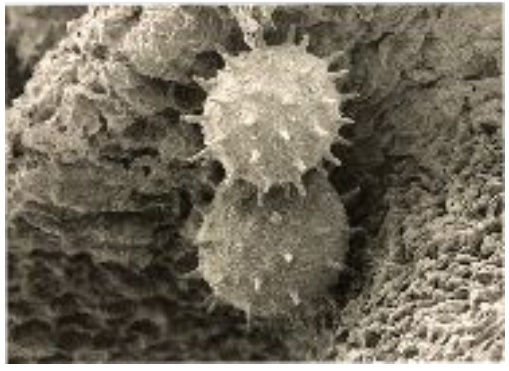
DePauw University

Supported by a DePauw University Inclusive Pedagogy

Buehler Biomedical Imaging Center - BBIC

The **Buehler Biomedical Imaging Center** is a core **undergraduate imaging, microscopy and flow cytometry facility**. Our mission is to **support undergraduate students** in the **biomedical and basic sciences** in order to prepare them for **success in graduate and medical programs** and ultimately to develop leaders our world needs.





Supported by a generous grant from the Buehler Family Foundation, A.C. Buehler ‘78, and Elisabeth Buehler Smith ‘11.

Buehler
BIOMEDICAL
IMAGING CENTER

Ernest Everett Just, Ph.D.

August 14, 1883 – October 27, 1941

Academics

- A.B. – Dartmouth College 1907
- Howard University – teaching position 1907 – started teaching English, then Biology, established the Department of Zoology with Just as Chair, 1907 -1938
- Howard University – Assistant Professor of Biology 1910
- Marine Biological Laboratory, Woods Hole, MA – 1909 work in F. R. Lillie's lab starts
- Ph.D. - University of Chicago 1916

Area of study

- Embryology
- Fertilization – monospermy - entrance of one sperm into one egg

roscope. Credit MBL Archives

Just playing horseshoes in Woods Hole. Credit: A.F. Huettner

Ernest Everett Just - Science

Discovery:

- Fertilization - one sperm per one egg

Outcome

- Monospermy
- entry point of the sperm determines the first cleavage plane.

Textbook:

The Biology of the Cell Surface

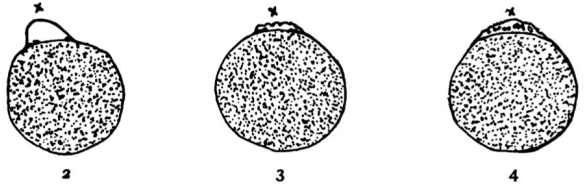


FIG. 2. An egg ten seconds after the disappearance of the sperm head within the egg.

FIG. 3. Same as Fig. 2.

FIG. 4. Four seconds after the membrane began lifting. Free vesicles beneath the membrane.

Advertisement from *Science*, 3 February 1939.

animals breed. Like many other forms, *Nereis* exhibits a lunar periodicity in its breeding behavior and is sexually mature only during the period from full to new moon of each lunar cycle from June to September (at Woods Hole, Mass.).[1]

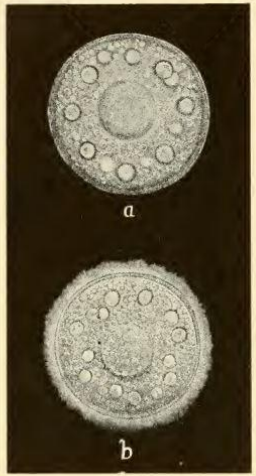


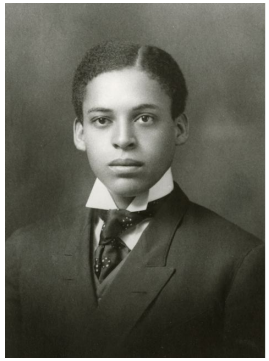
FIG. 22.—Drawings from photographs of *Nereis* eggs in a suspension of Chinese ink in sea-water (after Lillie). *a*, before insemination; *b*, three minutes after insemination.

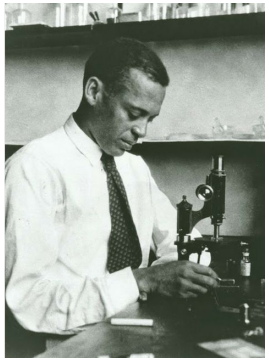
Although "ripe" eggs of *Nereis limbata* are available only during this particular moon-phase, their abundance and the clock-like precision of their development make them ideal objects for observation and experiments on fertilization. The fertilization-process as seen in the living egg is as follows:

When discharged or removed from the female the egg measures about 100 by 80 microns. It reveals in optical section at the centre a large formation, the germinal vesicle. Around this are greenish spheres, the yolk, among which are larger refringent bodies, the oil drops. Beyond the area of yolk and oil is a rim, the ectoplasm, made up of coarse strands disposed in a somewhat radial fashion which extend to the clearly discerned vitelline membrane. The eggs die in this stage with germinal vesicle and ectoplasm intact, unless fertilized or experimentally treated by means of inducing parthenogenesis.

[1] *Lillie and Just, 1913; Just, 1914, 1929a.*

Ernest Everett Just - Path





DARTMOUTH COLLEGE

Name Just, E.E. Course A.B. Class 1907

Home Address Charleston, S.C. Parent or Guardian

First Year 1903-1904

First Semester				Second Semester			
Subject	Mark	Hours	Grade	Subject	Mark	Hours	Grade
Greek 5	93	3		Greek 6	90	3	
Latin 1	83	3		Latin 2	86	3	
French 1a	86	3		French 2a	88	3	
Math. 1	53	4		English 2	84	2	
Eng. 1	83	2		Math. 2	69	2	
Hygiene	100	1		Math. 4, 4a	53	2	
				English 8	65	1	
Standing	79.0	16		Standing	79.3	16	

Second Year 1904-1905

First Semester				Second Semester			
Subject	Mark	Hours	Grade	Subject	Mark	Hours	Grade
Greek 7	80	3		Greek 8	80	3	
English 9	F			German 2	F		
German 1	75	3		Biology 2	96	3	
Biology 1	76	3		History 2	90	3	
History 1	83	3		Arch 4	90	3	
Greek 15	61	1		Greek 16	75	1	
Biology 1a	85	2					
Standing	78.2	15		Standing	87.9	13	

Third Year 1905-1906

First Semester				Second Semester			
Subject	Mark	Hours	Grade	Subject	Mark	Hours	Grade
Biology 3	95	3		Biology 4	88	3	
" 5	94	3		" 6	93	3	
" 7	93	3		" 10	92	3	
History 5	92	3		History 10	92	3	
" 9	95	3		" 6	92	3	
				" 12	93	3	
Standing	93.8	15		Standing	91.8	18	

Fourth Year 1906-1907

First Semester				Second Semester			
Subject	Mark	Hours	Grade	Subject	Mark	Hours	Grade
Biology 9	90	3		History 4	93	3	
" 13	93	3		Social. 2	93	3	
History 3	94	3		" 4	93	3	
Social. 1	95	3		Biol. 16	85	P.G.	
3	93	3		" 18	80	P.G.	
Biology 17	80	(P.G.)					
Standing	93.0	15		Standing	94.7		

Conditions	Removed

Matriculated Sept. 22, 1903 Major Biology

Graduated JUN 28 1907 1st Minor Greek

Degree A.B. 2nd Minor History

Average Standing 87.21 "Magna Cum Laude"

Position in Class 10 ΦBK

LIBRARY BUREAU BOSTON

- Grew up **in South Carolina**; his mother was a teacher
- **Colored Normal Industrial, Agricultural and Mechanical College of South Carolina**
- **Dartmouth College** – William Patten, Biology Professor
- **Howard University** – President Wilbur P. Thirkield; new science building in 1909
- Work in Frank. R. Lillie's lab at **Marine Biological Laboratory** (MBL) in Woods Hole, MA, in 1909
- **Paper published in 1912**; widely cited, Just's article demonstrated that the entry point of the sperm determines the first cleavage plane.
- Supported by **Jacques Loeb** at the MBL
- Publication led to the **promotion** to instructor,
- Became a **sought-after expert** in the handling and care of marine invertebrates and their eggs.

Sandra A. Murray, Ph.D.

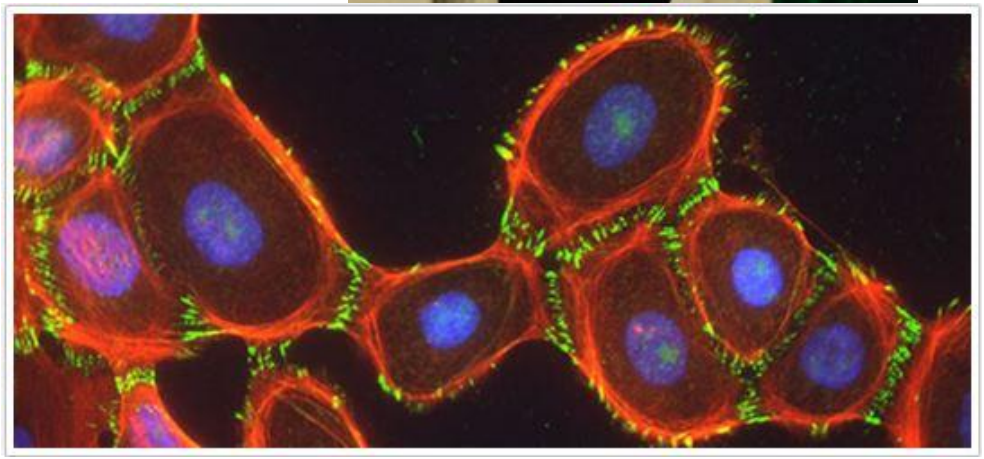
Professor, Clinical and Translational Science Institute,
University of Pittsburgh, PA

Academics:

- B.S. – U Illinois-Chicago 1970
- Masters – Texas Southern University 1973
- Ph.D. – University of Iowa 1980
- Postdoc – UC-Riverside 1980-1982
- Assistant professor – U Pitt 1982

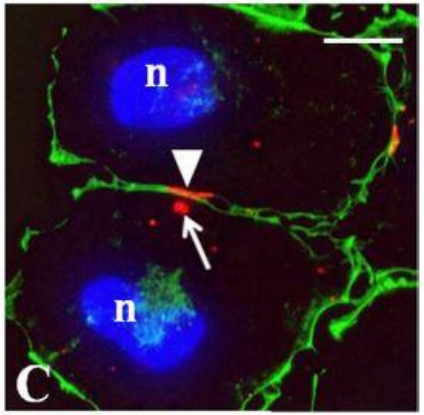
Area of study

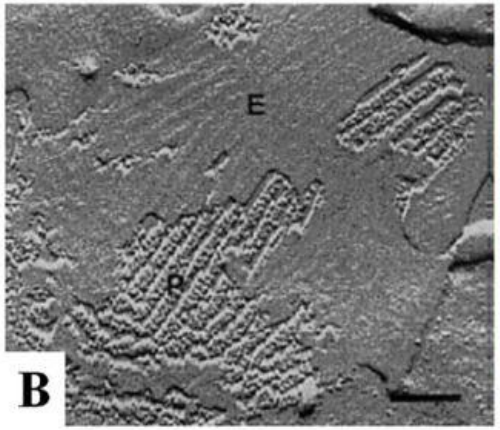
- Cellular organization of cell to cell communication
- Regulation of gap junction plaque assembly, disassembly and degradation in development, regeneration and proliferation of adrenal gland tumor cells

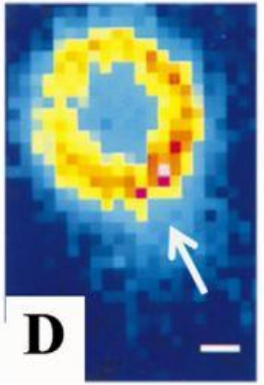


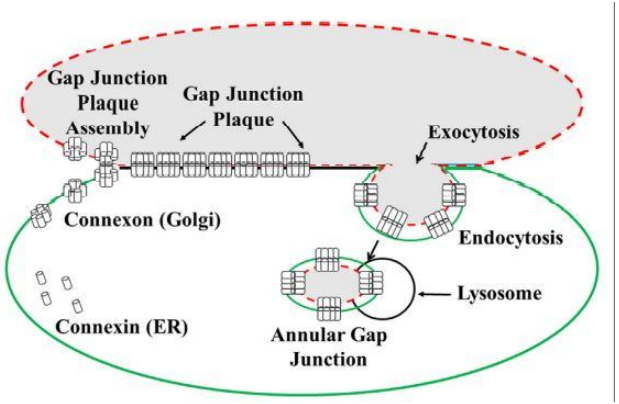
Sandra A. Murray – Science

- **Discovery:** Fewer gap junctions (cellular connections) correlate with higher cell proliferation rate; more gap junctions correlat with slower proliferation rate
- **Outcome:** Loss of gap junction can cause pathological conditions such as cancer







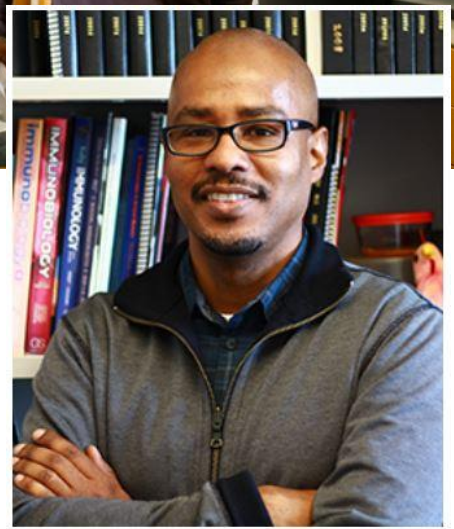


Sandra A. Murray - Path

- *“One of my high school science fair projects resulted in my being identified by a biology teacher to participate in a science program at the University of Chicago …….”*
- Experience as high school student in the department of Anatomy at the University of Illinois, School of Medicine.
  - **cleaning the the slides** that medical school students had used in their histology class.
  - *“Innovative at an early age, I decided to dump all the slides in a large glass container filled with alcohol overnight”* . . . . ended in disaster.
  - *“I **expected** him to hold the slide to the light and make the magical judgment call, “this is a slice of liver.” Instead, **he immediately went to the large microscope** sitting on a table in the corner. **A world opened for me that day!!!!”***
  - now sparkling slides (soaked, polished until they glittered, and newly labeled) impressed the chair of the department and got her her next job over holidays and summers.

Avery August, Ph.D.

Professor, Department of Microbiology and Immunology, Cornell University College of Veterinary Medicine, Ithaca, NY
Vice Provost for Academic Affairs, Cornell University College of Veterinary Medicine



- **Academics:**
- BS (Medical Technology, California State University at Los Angeles) 1987
- PhD (Weill Cornell Graduate School of Medical Science) 1994
- Postdoctoral fellow at The Rockefeller University
- Assistant Professor, The Pennsylvania State University at University Park 1999
- Distinguished Professor of Immunology in the Department of Veterinary & Biomedical Sciences, 2010 and Director of the Center for Molecular Immunology & Infectious Disease
- HHMI Professor; Professor of Immunology 2017
- Vice Provost for Academic Affairs Cornell University, College of Veterinary Medicine, 2018

Avery August - Science

Ares of Interest:

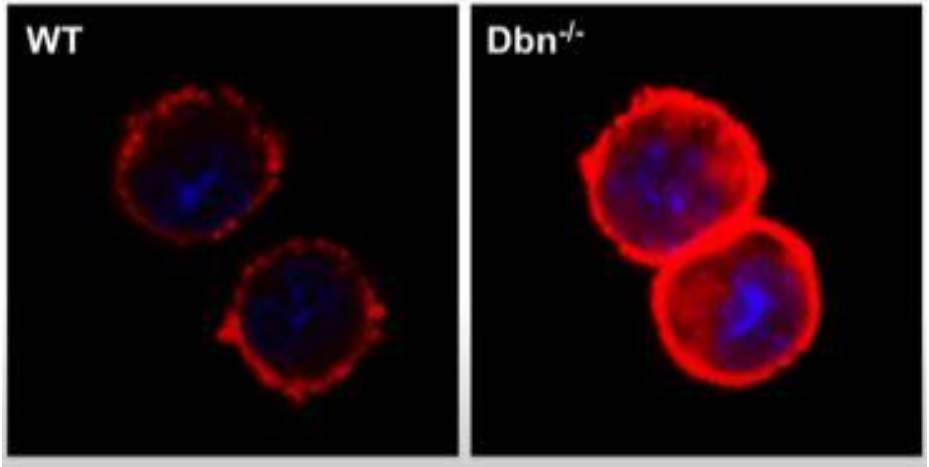
- Immunology – Immune System and Allergies
- Regulation of immune response by intracellular signaling events such as interleukins
- Regulation of production of inflammatory and anti-inflammatory cytokines by CD4+ and CD8+ T cells
- Regulation of CD8+ T cell memory development by Tec family kinases

Discovery:

- New cell signaling mechanism in T-cells

Outcome

- Potential new drugs for controlling immune responses



Avery August - Path

- *"…did not have the same hurdles as the namesake of this award, E. E. Just. My path was different."* *(from acceptance speech* E.E. Just Award in 2014 from the American Society for Cell Biology)
  - Migrated from **Belize** to the Los Angeles
  - Dropped out of high school to get his **GED** and registered at a **LA Community College**
  - Transferred to **California State University in LA** with a major in Medical Technology
  - His Biology professor Costello Brown suggested graduate school and joined Phoebe Dea's l
  - Entered **Graduate Ph.D. Program at Cornell School of Medicine**, NY

  - **first paper** in 1993 (August et al. 1993)
  - **Supported** by mentors and programs
    - NIH via a grant Research Infrastructure for Minority Institutions
    - NSF support for a minority postdoctoral fellowship at The Rockefeller University

Outreach

- Developed a program (NIH funded) Bridges to the Doctorate Program with Alcorn State University in Mississippi.
- Research program aimed at supporting students transferring from community colleges,

Pascal Lafontant and the BBIC

Department of Biology, Grinnell College

Academics

- B.S. in Engineering, Cornell University
- Ph.D. in Biomedical Sciences at Baylor College of Medicine, Houston, TX
- Postdoc at The Wells Center for Pediatrics Research at Riley Hospital and Indiana University School of Medicine
- Assistant Professor at DePauw - 2006
- Associate Professor at DePauw - 2013

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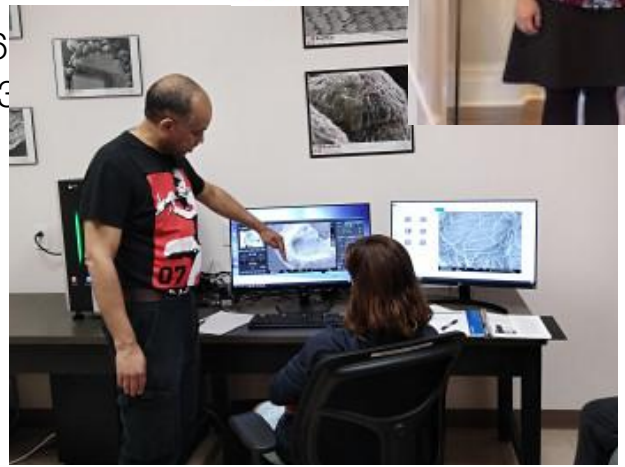

Area of Interest:

- Heart Regeneration after Injury
- Production of biological adhesives

Continued Mission of the BBIC

- **Outreach and workshops**

2021 BBIC Summer Research Workshop

2021 BBIC High School Student Workshop