

VUMC Reporter

Student researchers at VUMC earn accolades for their report

Oct. 12, 2023, 9:26 AM




The 2023 Aspirnaut summer research interns, flanked by the program's co-founders, Julie Hudson, MD, left, and Billy Hudson, PhD, back row, right. (photo by Susan Urmy)

by *Bill Snyder*

A research paper co-authored by 23 high school and undergraduate students participating in Vanderbilt University Medical Center's [Aspirnaut](#) summer research program has been

Share This
Story

Media Inquiries

[Bill Snyder](#) · (615)
322-4747 · 

Explore Story
Topics

[Reporter](#) [Aspirnaut](#)

[Billy Hudson](#)

[Department of Medicine](#)

[featured-Reporter](#)

[Journal of Biological Chemistry](#)

[Julie Hudson](#)

[October 2023](#)

[STEM education](#)

selected as one of the “Editor’s Picks” by the *Journal of Biological Chemistry*.

Aspirnaut is a STEM pipeline program “for diversity and wellness” that offers intellectually challenging experiences and opportunities in science, technology, engineering and mathematics to talented youth from rural and diverse backgrounds.

For more than a decade, successive groups of “Aspirnauts” participating in the summer research program at VUMC have investigated the organization and evolution of the collagen IV scaffold, the fundamental architectural unit of the basement membrane that connects cells and strengthens tissues.

Understanding how this protein scaffold bridges the transition from unicellular to multicellular animal life sheds light on diseases as diverse as kidney failure and cancer, said Aspirnaut co-founder Billy Hudson, PhD, the Elliott V. Newman Professor of Medicine known for his contributions to the field of matrix biology.

Among the lab techniques the students learned was polyacrylamide gel electrophoresis, which is used to separate proteins. Sergey Budko, PhD, assistant professor of Medicine and first author of the paper, modified the technique by adding an amount of salt sufficient to keep collagen IV intact during separation.

The modified technique, he said, enabled the students to analyze multiple tissues from 34 different animals and to discover the “primordial role” that chloride ions, through the pressure they exert on cells, play in driving collagen IV assembly and stability.

The *JBC* editors, in their special recognition of the [paper](#), which was posted online prior to publication, noted that this work provides “an exceptional contribution to the field.”

“The fundamental discovery of Aspirnauts profiled in this paper underscores the power of what a team of talented high school and undergraduate students can accomplish with excellent mentorship and a well-planned scientific expedition,” said Julie Hudson, MD, Aspirnaut co-founder and executive director.

Since the summer research program was launched in 2009, more than 300 students from 34 states have participated. *To* date, nearly 90 have gone to earn MD degrees, PhDs, or both.

Their research findings have been published in prestigious journals including *Nature Chemical Biology*, the *Proceedings of the National Academy of Sciences (PNAS)*, [eLife](#), and now, *JBC*.

In addition to Budko and the Hudsons, co-authors of the paper from VUMC included Vadim Pedchenko, PhD, Elena Pokidysheva, PhD, Rachel Baugh, MS, Aaron Fidler, PhD, Sergey Ivanov, PhD, Tetyana Pedchenko, PhD, Mohamed Rafi, MS, Roberto Vanacore, PhD, and Gautam Bhave, MD, PhD.

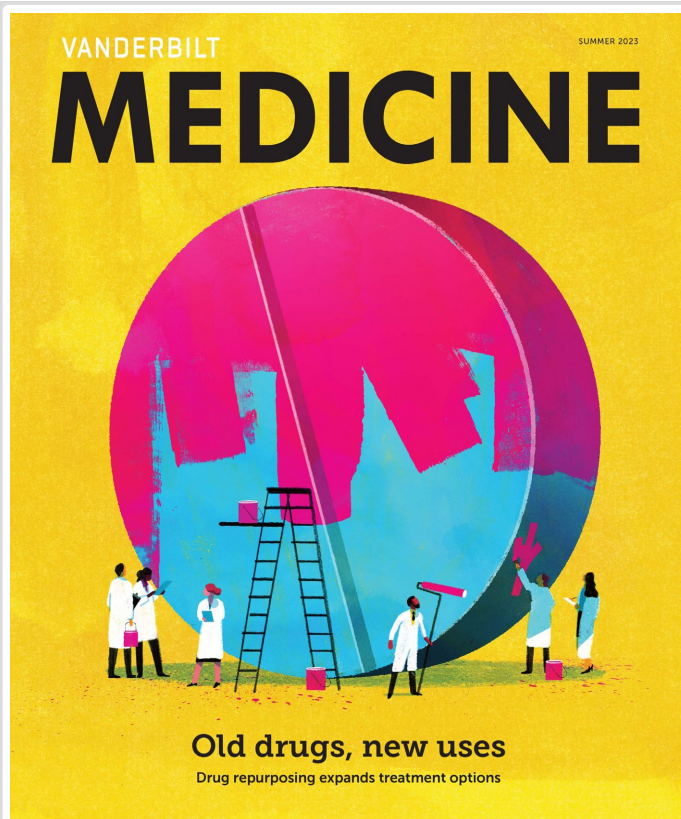
Aspirnaut co-authors were Octavia Ailsworth, ZaKylah Bryant, Camryn Cole, Jacob Edward, Di'Andra Edwards, Sydney Farrar, Julianna Gallup, Michael Gallup, Martina Gergis, Aalia Holt, Madeline Lach, Elizabeth Leaf, Finn Mahoney, Max McFarlin, Monica Moran, Galeesa Murphy, Charlotte Myers, Connie Ni, Neve Redhair, Rocio Rosa, Olivia Servidio, Jaeden Sockbeson and Lauren Taylor.

The research was supported by National Institutes of Health grants R01DK018381 and R01DK131101. The Aspirnaut high school students were supported by the Springer-Lu Family Foundation of Chestnut Hill, Massachusetts, and the undergraduate students by NIH grant R25DK096999.

Related Posts:

1. [Aspirnaut education program reaches decade mark](#)
2. [Science career "pipeline" garners national attention](#)
3. [Aspirnaut scientific symposium set for Friday, July 14](#)
4. [Summer program gives high schoolers taste of discovery](#)

Recent Stories from VUMC News and Communications Publications



VANDERBILT UNIVERSITY
MEDICAL CENTER

VUMC VOICE
News and information for the Vanderbilt University Medical Center community

VUMC Publications Calendar & Events Contact Search

EMPLOYEE SPOTLIGHT
Midwives saving lives
By Emily Stemberge

The mother of the groom was choking at a wedding reception. A person needed CPR on a plane. Two Vanderbilt midwives stepped up.

[READ MORE](#)

Recent Stories from VUMC News and Communications Publications

HEALTH AND MEDICINE Large study finds higher burden of acute brain dysfunction for COVID-19 ICU patients	REPORTER VUMC mourns loss of otolaryngologist and surgeon Rife	REPORTER Autism theory 25 years in the making
HEALTH AND MEDICINE Vitamin D activation and cancer risk	HEALTH AND MEDICINE Building a cohort, the easy way	REPORTER Freeman named director of the Division of Cardiovascular Medicine

[MORE](#)

[more](#)

Connect with Vanderbilt University Medical Center



[Find a Doctor](#)
[Parking and Transportation](#)
[Patient and Visitor Info](#)
[School of Medicine](#)
[School of Nursing](#)
[Vanderbilt University](#)
[Eskind Biomedical Library](#)
[Office of Research](#)
[Giving](#)
[Volunteer](#)
[Information Privacy](#)
[Digital Privacy Policy](#)
[Careers](#)
[About VUMC](#)

Popular Links

[Services We Offer](#)
[Vanderbilt Health](#)
[My Health at Vanderbilt](#)
[Medical Record Information](#)
[Request an Appointment
For Referring Providers](#)

Vanderbilt University Medical Center

1211 Medical Center Drive
Nashville, TN 37232
(615) 322-5000

© 2024 Vanderbilt University Medical Center · All rights reserved.

Vanderbilt University Medical Center is committed to principles of equal opportunity and affirmative action.
Vanderbilt®, Vanderbilt University Medical Center®, V Oak Leaf Design®, Monroe Carell Jr. Children's Hospital
at Vanderbilt® and Vanderbilt Health® are trademarks of The Vanderbilt University.