HEPATITIS B FOUNDATION | Baruch S. BLUMBERG INSTITUTE

NEW initiatives, NEW stories, and NEW challenges

Turning Challenge into Momentum for Cure and Elimination

2025 ANNUAL REPORT

Turning Challenge into Momentum for Cure and Elimination

Dear Friends and Colleagues,

As you will see throughout this Annual Report, 2025 was a tremendous – and extraordinarily busy – year for the Hepatitis B Foundation. I could not be prouder of our team, our Board, our partners, and our community of advocates who rose to meet unprecedented challenges with clarity, courage, and resolve.

This year, we led the national fight to protect the hepatitis B vaccine and the universal birth dose recommendation in the U.S. In the face of threats to scientific integrity and public health infrastructure, we conducted 52 Congressional visits, submitted report language across multiple federal agencies, mobilized hundreds of advocates, and helped generate more than 80 national and international media stories elevating hepatitis B, hepatitis D, and liver cancer as public health priorities. Our collective advocacy contributed to the reopening of the CDC's viral hepatitis laboratory, spotlighting the importance of the hepatitis B vaccine, and ensured hepatitis B funding remained firmly in the national conversation. We demonstrated that when science, community voices, and strategic advocacy come together, they can help protect decades of progress.

At the same time, we continued to grow and strengthen hepatitis B, hepatitis D, and liver cancer programs locally, nationally, and globally. We expanded screening, vaccination, and provider education efforts—reaching thousands of clinicians and hundreds of thousands of community members. Our Project ECHO sessions trained healthcare providers across 11 countries. Our digital footprint surpassed 2.5 million website visitors, and our storytelling videos reached audiences in more than 21 countries in 14 languages.

Our African Hepatitis B Advocacy Coalition (ABAC) grew into a pan-African network of more than 200 members across 25 countries, supporting policy reform, perinatal prevention, community-based programming, and implementation of updated treatment guidelines. Through our Community Grants Catalyst Fund, we began investment directly in local leadership across seven African countries—because sustainable change must be community driven.

We also advanced patient-centered research in meaningful ways. We launched a PCORI-funded consortium committed to building capacity in comparative effectiveness research for hepatitis B. We initiated HepB PROACTive, a multi-country study to better understand quality of life, treatment adherence, and lived experience among people living with hepatitis B and D. Our Community Advisory Board deepened engagement with drug developers to ensure patient voices shape clinical trials and therapeutic development.

In 2025, our scientific leadership was also evident in 13 peer-reviewed publications and 52 external presentations reaching more than 7,000 learners. We continued to push the field forward—advocating for unified terminology, expanded treatment access, greater inclusion in clinical research, and renewed urgency around cure research.

Every milestone in this report reflects meaningful partnership—scientists, clinicians, storytellers, advocates, policymakers, funders, community leaders, and supporters who continue to lead with extraordinary resilience and hope. Together, we are protecting prevention, advancing science, elevating lived experience, and building the path toward elimination and cure.

I look forward to the year ahead and to continuing this work with all of you, our supporters, partners, and friends.

With gratitude,

Chari Cohen, DrPH, MPH
President
Hepatitis B Foundation

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Policy and Advocacy in U.S. and Globally

Last year, the Hepatitis B Foundation led a coordinated, year-long response to the threats to the federal recommendation for universal hepatitis B birth-dose vaccination.

The Hepatitis B Foundation (HBF) advanced birth-dose awareness by adding new **#justB** storytellers and developing a dedicated **media toolkit**. Our strategic advocacy efforts, led by **Michaela Jackson, MPH, MS**, program director for prevention policy, included submitting questions for multiple Congressional hearings, helping elevate hepatitis B as a key discussion point, and submitting federal report language aimed at preserving the Vaccines for Children program and the National Perinatal Hepatitis B Program.

We also expanded education initiatives by hosting a **live town hall** with experts from the Children's Hospital of Philadelphia's Vaccine Education Center and the University of Pennsylvania, offering a national and state-level webinar series with the National Viral Hepatitis Roundtable and the Pennsylvania Department of Health, and promoting best practices for universal birth dose and adult hepatitis B vaccination.

Hep B United's B the Change Action Center organized a national virtual advocacy day on April 30, 2025—recognized as **Adult Hepatitis B Vaccination Awareness Day**—bringing partners from across the country together to meet with their members of Congress. Nearly 50 advocates participated in 27 meetings representing 12 states. They urged Congress to: **increase funding for viral hepatitis programs** at the U.S. Centers for Disease Control and Prevention (CDC) to strengthen surveillance, prevention, testing and linkage-to-care efforts; **fully fund CDC's initiative to eliminate opioid-related infectious diseases**; and encourage the federal Department of Health and Human Services to **reopen its viral hepatitis laboratory**.

These meetings provided a platform for storytellers, public health leaders and advocates to emphasize the critical investments needed to educate communities, expand protection, and advance the elimination of hepatitis B. They also highlighted the harmful public health consequences stemming from recent Congressional actions.

In May 2025, **HBF released a new white paper** on expanding hepatitis B screening, vaccination, and education in U.S. correctional facilities. The paper underscores the disproportionate burden of hepatitis B in these settings and identifies opportunities to address longstanding disparities through policy and practice improvements.

Global Advocacy

For Zero Discrimination Day (March 1), HBF released two major policy resources to support people living with hepatitis B around the world.

Empower and Protect: A Comprehensive Toolkit for Combating Hepatitis B Discrimination provides an international overview of where discrimination occurs, offers policy recommendations, and includes model anti-discrimination policies for governments to adopt. The second resource, *A Guide to Address Hepatitis B Discrimination and Know Your Rights*, draws from global reports submitted to HBF's Discrimination Registry and outlines community-driven interventions to combat discrimination. Together, these resources encourage countries to document hepatitis B-related discrimination within their borders and implement meaningful policy reforms to eliminate it.

View and download these resources at:
www.hepb.org/assets/Uploads/Global-Discrimination-Policy-for-HBV-03.03.2025.pdf
www.hepb.org/assets/Uploads/Discrimination-Report-KYR-Guide.pdf

THE FOUNDATION'S GLOBAL HEPATITIS B & D COMMUNITY ADVISORY BOARD GROWS

The Hepatitis B Foundation's Global CAB continued to grow and make important contributions to ensure patient-centricity of hepatitis B and D research. In June 2025, the CAB concluded a three-month recruitment and selection process, resulting in the onboarding of five new CAB members in July 2025, including four members with lived experience of hepatitis D (HDV) and representation from a new country (Kazakhstan).

During the reporting period, HBF's Global CAB held seven engagement meetings with stakeholders across industry, academia, and regulatory agencies, including the FDA and EMA. Members provided patient-centered input, including review and feedback on clinical trial protocols and informed consent forms.

CAB representation was maintained at international conferences sponsored by four key organizations: the **Asian Pacific Association for the Study of the Liver** (APASL), **Conference on Liver Disease in Africa** (COLDA), **American Association for the Study of Liver Disease** (AASLD) and **World Hepatitis Summit** (WHS). Also over the past year, members contributed formal patient perspective input to the AASLD draft hepatitis B treatment guideline updates.

BUILDING COMMUNITY

by convening clinicians, scientists and people living with hepatitis B

The Hepatitis B Foundation coordinates the International HBV Meeting every September. This is the world's largest scientific meeting on hepatitis B. The 2025 meeting, which was held Sept. 8-12 in Berlin, brought together nearly 430 scientific and clinical professionals from around the world.

The human impact of hepatitis B and delta, and the challenges of treating the conditions, were the focus on day one, Sept. 8, when hundreds gathered in person and online for the sixth annual **Hepatitis B Community Forum**, which was co-hosted by the Hepatitis B Foundation and ICE-HBV.

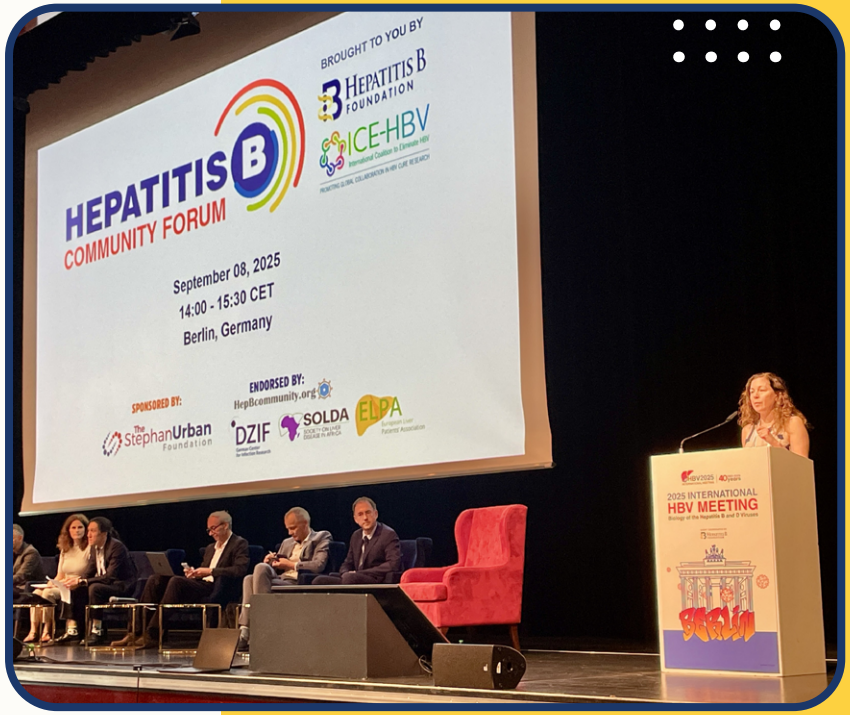
On the Forum's agenda was a panel discussion with people living with hepatitis B and delta in Europe and three German physicians providing their personal perspectives and ideas for more effectively preventing and treating hepatitis B and delta. As an annual part of the **International HBV Meeting** since 2019, the Forum aims to raise public awareness about the disease and provide a platform for engagement between attendees at the International HBV Meeting, and the broader hepatitis B affected community.

Highlights of the 2025 Community Forum in Berlin

1. **Current hepatitis B and hepatitis delta treatment landscapes in Germany**
2. **Epidemiology, progress and challenges with hepatitis B and delta elimination in Germany**
3. **Lived experience of hepatitis B and delta in Europe – Interactive panel session**
4. **Moderated discussion and audience Q&A.**

The Forum's participants identified the best approaches to fast-track an HBV cure, improve therapeutic approaches and eliminate the negative impact of hepatitis B and delta on individuals and communities around the world.

You can find a recording of the Forum on YouTube:
www.youtube.com/watch?v=Lwly5yY11KY



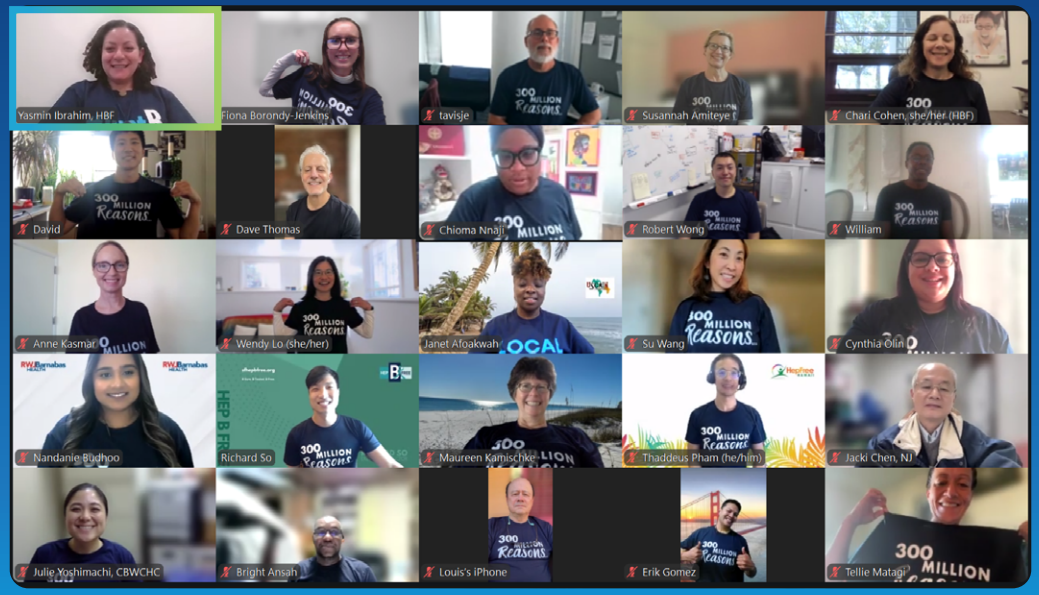
Dr. Chari Cohen, president of the Hepatitis B Foundation, welcomed attendees to the Community Forum.

PCORI ENGAGEMENT AWARD

The Hepatitis B Foundation was awarded a highly competitive two-year Engagement Award (2025–2027) from the Patient-Centered Outcomes Research Institute (PCORI)—the first PCORI award focused on hepatitis B. Through this funding, the Foundation established a 33-member, multi-sectoral National Hepatitis B Consortium representing people with lived experience, community leaders, clinicians, researchers, payors, federal agencies and other key stakeholders.

The Consortium's goal is to systematically integrate patient priorities into hepatitis B drug development and comparative clinical effectiveness research (CER), while elevating the voices of people living with hepatitis B across research and policy discussions. This initiative, which is being led by **Yasmin, Ibrahim, MD, PhD, MBA**, also aims to address persistent health disparities and improve outcomes by building sustainable infrastructure for stakeholder engagement and patient-centered research.

This award marks the Foundation's first entry into the CER space, representing a significant milestone for both the organization and the broader hepatitis B field.



The PCORI Consortium, with members worldwide, meets regularly on Zoom.

HEPATITIS B FOUNDATION DIGITAL MEDIA, 2025

Visits to www.hepb.org
2.5 million

Facebook followers
35,800

Blog views
306,000

Podcast downloads
3,550

E-newsletter subscribers
19,300

Patient consults
3,100

ABAC
African Hepatitis B Advocacy Coalition

Foundation launches African Hepatitis B Advocacy Coalition (ABAC) in 25 countries

Year one saw great progress for ABAC, our expanded program in Africa. For years, community-based organizations (CBOs) across Africa have fought hepatitis B in silos, trying to improve testing and linkage to care and treatment with few resources, and little capacity or technical support. In 2025, at the request of many CBOs, the **Hepatitis B Foundation launched the African Hepatitis B Advocacy Coalition (ABAC)**, led by **Catherine Freeland, PhD, MPH**, our associate director of public health research.

A major, multi-year effort, ABAC's goal is to strategize, align and support the countless organizations across the content working on hepatitis B elimination. Since early 2025, the coalition has grown to over 200 members representing more than 25 countries. The organizations share common challenges: limited funding, fragmented resources, inadequate data systems and need for capacity and support. Now, with ABAC, these organizations are receiving support and learning and growing together in synergy and strategic alignment.

200+ MEMBERS
25 COUNTRIES

Coalition members range from teaching hospitals to grassroots advocates, from seasoned public health experts to individuals who simply want to prevent others from facing what they've endured.

The approach is practical. Monthly peer-learning calls bring together CBO leaders to troubleshoot real problems. A WhatsApp group answers questions and provides advice at all hours. One of the biggest capacity building efforts for ABAC is the recently launched **community catalytic funding grants** to which 60 applied, and **11 grants were awarded from 7 countries to fund local elimination efforts** with technical mentorship to support best practice model development and community grassroots leadership. In 2025 alone, the coalition distributed over $45,000 to organizations running perinatal prevention programs and community screening initiatives across six countries.

One notable best practice project that was started in 2025 through the coalition was co-led by the **Hepatitis Advocacy Foundation** and **Pharm. Prince Okinedo.** This prospective implementation study evaluated interventions to reduce perinatal hepatitis B transmission across five high-volume public health facilities in Delta State, Nigeria. Prior to the intervention, timely hepatitis B birth dose (within 24 hours) coverage was low due to non-daily vaccination practices; following implementation of daily vaccination services, timely birth dose coverage increased to 100% across all pilot facilities. Lessons from this project have and will continue to be shared with the ABAC community and expanded. Other projects featured awareness, perinatal prevention programs and enhanced screening in Cross River State Nigeria, Mali, Uganda and Tanzania and lessons learned and methods will continue to be shared within the broader coalition.

Furthermore, the ABAC coalition is shaping policy at the highest levels. In Sierra Leone, ABAC is helping craft the country's first comprehensive anti-discrimination protections policy to prevent people living with hepatitis B from discrimination. Anti-discrimination policies are also taking shape in Liberia and Delta State, Nigeria with leadership from community partners. In Somalia, along with many other countries without timely hepatitis B birth dose, the coalition is supporting the Ministry of Health's application for Gavi birth dose funding.

What makes ABAC different is its insistence that communities lead. The coalition's four pillars—**capacity-building**, **data-sharing**, **community leadership**, and **multi-stakeholder collaboration**—ensure that solutions emerge from those closest to the problem.

As ABAC expands its mentorship networks and regional hubs, the message is clear: With a convening role played by the Hepatitis B Foundation, Africa's hepatitis B fight is no longer fragmented. It's coordinated, strategic and growing stronger by the day.

View and download these resources at: **https://abachepb.org/policy-templates-and-tools-for-hepatitis-b**

MORE STORYTELLERS IN ACTION:
Amplifying Voices, Inspiring Change

In 2025, the Hepatitis B Foundation's Storytelling Program continued to share and amplify the voices of those living with hepatitis B, hepatitis D and liver cancer, reaching audiences across the globe and strengthening advocacy, education and community engagement.

Over the past year, **we published 40 new storytelling videos, including 31 international *#BtheVoice* and 9 *#justB* videos**. These videos netted over 31,000 views on YouTube. That's a 168% increase compared to the prior year! Through these efforts, Hepatitis B Foundation storyteller's content reached audiences in more than 21 countries, with stories available or subtitled in 14 languages.

The program also supported storytellers in taking their lived experiences into advocacy and policy spaces. In 2025, storytellers participated in 56 advocacy activities, including webinars, conferences, news media interviews, manuscript writing, Congressional Hill Days, PCORI engagement and educational briefings.

Capacity building and leadership development remained a central focus, through our new ***Storytellers in Action*** training program, which graduated its first cohort of 10 storytellers in 2025. In total in 2025, **we delivered 17 trainings and workshops and supported 36 storytellers in public speaking engagements**. Additionally, eight storytellers served as mentors to other advocates, fostering a peer-to-peer leadership network. The impact of the training and mentorship programs are clear — storytellers report increased confidence, reduced stigma and greater willingness to advocate publicly.

In 2025, we expanded our storytelling program to new regions, including **Tokyo, Switzerland, Russia, Germany, Moldova, India, Malawi and Uzbekistan**, plus we added Hindi as a new storytelling language. Storytellers also elevated priority public health topics through their narratives, including hepatitis delta, liver cancer, and hepatitis B vaccine.

Overall, the ***#justB Storytelling Program*** in 2025 contributed significantly to the Hepatitis B Foundation's work by combining personal narratives with advocacy, education and leadership development, ensuring that the voices of those affected by hepatitis B continue to shape public awareness, policy, and community engagement worldwide.

40 NEW STORYTELLING VIDEOS

36 PUBLIC SPEAKING EVENTS

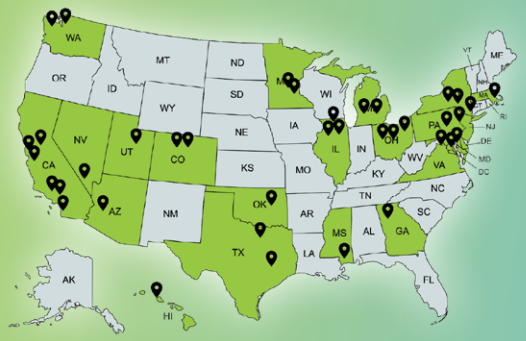
31,000 VIEWS ON YOUTUBE
168% increase

21 COUNTRIES
14 LANGUAGES
31 INTERNATIONAL STORIES

Find these and more stories at:
www.hepbstories.org

HEP B UNITED'S REACH KEEPS GROWING

Our nationwide coalition, Hep B United (HBU), now comprises 50 local members and 17 national members working across 28 states in 42 cities, including Washington, D.C.



Providing Training to Hep B United Partners

The *Hep B United* coalition convened its third **Learning Collaborative** in October of 2024. Four organizations took part in this cohort-based training program of community-based health centers to integrate and improve their capacity to implement hepatitis B education, screening, vaccination and linkage-to-care programs. Selected community health centers with model hepatitis B programs trained the cohort on community engagement, prevention and control programs, and shared best practices, skills, strategies and resources. These organizations have since taken their training and applied it to improve their programs.

Supporting Hep B United Partners

Each year, *Hep B United* offers mini-grants to enhance the capacity of coalition partners to conduct hepatitis B education, testing and linkage to care in their local communities. The emphasis of this funding is focused on programs addressing hepatitis B among African immigrant, Asian American, Native Hawaiian and Pacific Islander communities, and persons who use drugs. **Awards totaling $55,000 were given to seven organizations for the 2025 mini-grant cycle.** Since 2014, *Hep B United* has given out 85 grants totaling nearly $742,000.

B HEPPY PODCAST

The Hepatitis B Foundation's podcast, *B Heppy*, empowers and informs the global community of people living with hepatitis B. By providing a platform for shared experiences and expert insights, the podcast serves as a valuable resource for navigating the complexities of the diagnosis and more.

Highlights of the past year

1. **Education & Advocacy:** Tackling diverse topics related to hepatitis B to provide listeners with up-to-date, reliable information.
2. **Community Building:** Fostering a connected, collaborative global network to ensure no individual feels alone in their journey.
3. **Expert Engagement:** Featuring a diverse range of voices, including patient storytellers, physicians, scientists and public health professionals.

Impact and Reach

Since its launch in 2021, the team has produced nearly 70 episodes of the podcast, providing new content regularly with nearly 20,000 downloads. Recent programming has highlighted critical global health issues, such as personal accounts of living with hepatitis B and D co-infections, our new **African Hepatitis B Advocacy Coalition** (ABAC) and discussions with medical advisors on removing barriers to treatment and expanding care.

Through its multi-channel presence—including YouTube, Instagram and Facebook, *B Heppy* continues to unite the hepatitis B community, transforming shared challenges into a unified movement for awareness and support.

B Heppy library: **https://bheppy.buzzsprout.com**

Research Program

Award-winning scientist joins Blumberg Institute

Award-winning scientist Michael J. Sofia, PhD, who discovered the first reliably effective treatment for hepatitis C, joined the Blumberg Institute in 2025 as a distinguished professor and principal investigator. He is leading the Institute's growing efforts to commercialize technologies developed by its scientists.

Dr. Sofia co-founded Arbutus BioPharma Inc. and was its chief scientific officer for 12 years until his recent retirement. He is internationally recognized for his work on the **discovery and development of drugs to treat and cure viral diseases including hepatitis C and hepatitis B.**

During his career Dr. Sofia has introduced numerous drugs into clinical development and is responsible for the discovery and early development of sofosbuvir, which became the backbone of many hepatitis C curative therapies including Sovaldi, Harvoni, Epclusa and Vosevi. He has published extensively in the area of drug discovery and development.

Dr. Sofia held research and research management positions at Gilead Sciences, BMS, Eli Lilly and other companies. He earned a BS in chemistry from Cornell University and a PhD from the University of Illinois at Urbana-Champaign, and he was a National Institutes of Health postdoctoral fellow at Columbia University.

In 2017, Dr. Sofia was inducted into the American Chemical Society Hall of Fame and is a Fellow of the Royal Society of Chemistry. His many awards for his work on hepatitis C include the 2015 Economist Innovation Award, the ACS Heroes of Chemistry Award, the Lasker-Debakey Award in Clinical Medical Research, the Elion Award from the International Society for Antiviral Research and the Cameron Prize for Therapeutics from the University of Edinburgh.

JU-TAO GUO LAB

Ju-Tao Guo, MD, *W. Thomas London Distinguished Professor,* president and chief scientific officer, is investigating the mechanisms of hepatitis B virus (HBV) and flavivirus replication with molecular cell biology and chemical genetics approaches and developing therapeutics for the treatment of chronic hepatitis B (CHB) and emerging RNA virus infections.

Postdoctoral fellows: Bo Chen, PhD; Tanner Grudda, PhD; Jun Lyu, MD, PhD; Hemraj Rimal, PhD.; Gideon Tolufashe, PhD; Yuxiang Wang, PhD
Senior Biochemist: Kayleigh McGovern-Gooch, PhD
Senior Computation Chemist: Kristi Fan, PhD

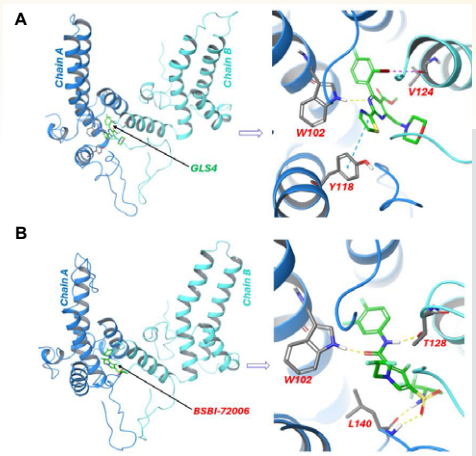


Figure. Binding pose of a representative CAM-A (GLS-4) (A) and BSBI-72006, a SPA chemotype of CAM-E (B). The right panel shows the CAM binding pocket at core protein dimer-dimer interface. The right panel highlights the distinct binding pose and interactions with amino acid residues at the CAM pocket.

HBV replication

The **Guo lab** is dissecting the host–virus interactions that enable selective packaging of HBV DNA polymerase and pregenomic RNA (pgRNA) into nucleocapsids, as well as the subsequent reverse transcription that generate relaxed circular and double-stranded linear DNA genomes. In parallel, they are also defining the structural features of HBV envelope proteinss and the host factors that drive the assembly and secretion of virions and subviral particles. By mapping these processes, they seek to identify new therapeutic targets that disrupt HBV morphogenesis and viral persistence.

Development of antiviral therapeutics and immunomodulators for the cure of chronic hepatitis B

In collaboration with **Dr. Yanming Du**, professor and director of medicinal chemistry, and **Dr. Jinhong Chang**, **Harvey J. Alter** Professor and vice president of drug development, the Lab is developing a best-in-class HBV capsid assembly modulator (CAM), BSBI-3-02. As illustrated in the **Figure**, this class of capsid assembly modulators, such as BSBI-72006, binds to a hydrophobic pocket between the core protein dimer-dimer interface in a distinct binding pose from that of GLS-4 and induces the assembly of T=3 empty capsids. They are also developing a liver-targeting innate immune modulator to facilitate the functional cure of CHB.

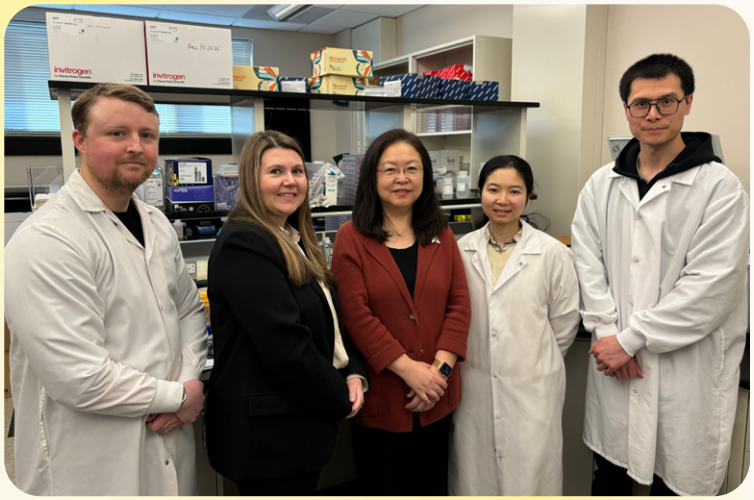
In collaboration with **Dr. Qiong Zhao**, assistant professor, and **Minghong Zhong**, adjunct professor, the Lab is designing and optimizing gene editing systems for efficiently inactivating covalently closed circular DNA (cccDNA) and integrated HBV DNA, two major reservoirs responsible for chronic infection and viral rebound.

Flavivirus replication mechanism and antiviral development

In collaboration with **Drs. Jinhong Chang** and **Yanming Du**, the Lab is investigating the roles and mechanisms of flavivirus NS4B protein in viral RNA replication and evasion of innate immune responses by using NS4B inhibitors as chemical probes. This mechanistic work also supports the discovery and development of novel antiviral agents targeting flavivirus NS4B as well as other non-structural proteins.

Further collaboration

Dr. Kayleigh McGovern-Gooch, **Dr. Kristi Fan** and **Dr. Gideon Tolufashe** collaborate across the BSBI research portfolio to provide biochemical analyses and computational chemistry support, enabling structure guided antiviral drug discovery and mechanistic interrogation.



JINHONG CHANG LAB

Jinhong Chang, MD, PhD, is the vice president of drug development and *Harvey J. Alter professor*. The Chang Lab focuses on discovery and development of antiviral drugs and innate immune modulators for treatment of hepatitis B, hepatitis D, dengue, yellow fever and other viral hemorrhagic fevers.

Research team: David Renner, PhD; Julianna Deakyne, PhD; Jinhong Chang, MD, PhD; Jiaqi Li, MS; and Fuxuan Wang, PhD

Yellow fever, discovery and development of antiviral compound

Working with **Dr. Ju-Tao Guo**, the Institute's president and chief scientific officer, and **Dr. Yanming Du**, professor and director of medicinal chemistry, the Chang research team discovered the cellular process behind virus replication and the first orally available drug candidate for yellow fever. The compound has performed exceptionally well in animal studies and, with funding from the NIH, the team is now conducting the remaining preclinical studies needed to estimate a safe starting dose in humans.

The drug candidate targets a viral protein called NS4B, which is essential for yellow fever virus replication. Targeting a protein is a novel approach for an antiviral drug, as most target enzymes. The team discovered that blocking NS4B causes the virus's replication structures to break down and halts production of the viral genetic material, which was published May 2025 in the ***Proceedings of the National Academy of Sciences***. The drug also boosts the body's natural antiviral defenses since the viral structures are leaked. The team found that viral replication stopped within 30 minutes of treatment, which is important in fast-moving infections like yellow fever.

Also in 2025, the drug was featured in the INTREPID Alliance's Antiviral and Preclinical Development Landscape – 4th Edition, as one of only 16 non-COVID-19 candidates to reach late lead or potential candidate stages in preclinical development.

The team is currently testing whether the virus can become resistant to the drug. After repeatedly exposing infected cells to very high levels of the drug for more than 30 rounds, the virus has not developed meaningful resistance. The team is continuing to study how the drug works at the molecular level, including how it binds to the viral target and blocks infection.

A Phase I clinical trial is planned for late 2026, pending successful completion of preclinical milestones.

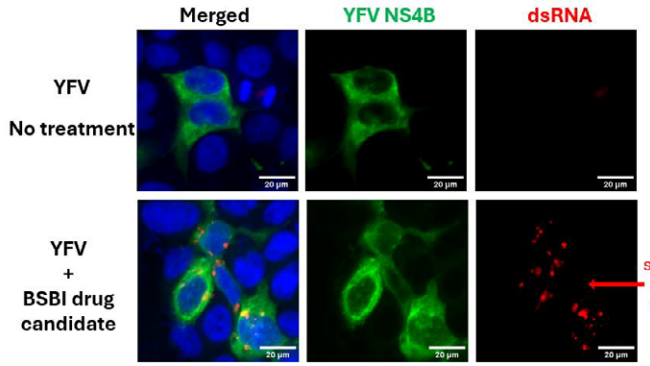
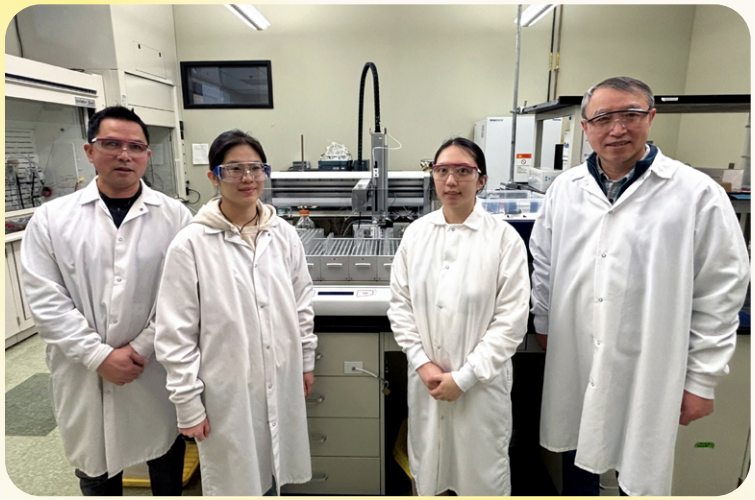


Figure. This figure shows that in yellow fever virus (YFV) infected cells, after six hours of treatment with our drug candidate, viral RNA can be seen spilling out of the virus's "replication center" under the microscope.



YANMING DU LAB

Yanming Du, PhD, professor and director of medicinal chemistry, focuses on viral and cancer drugs. The Lab synthesizes new chemical compounds to illustrate biological mechanisms or evaluate them as therapeutics.

Research team: Zhengyuan Jiang, Dan Nguyen, Yusheng Wu, PhD

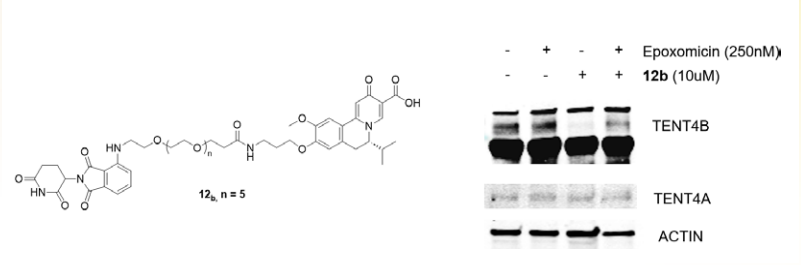


Figure. Studying the use of proteolysis-targeting chimera (PROTAC) against both hepatitis B and hepatitis A

New discovery in potential first treatment for Hepatitis A

The Du lab developed a new compound to treat hepatitis A, which despite considerable burden has no currently available antiviral therapies. The compound, HS83128, is a novel third-generation hepato-selective dihydroquinolizinone (HS-DHQ) and has exhibited potent antiviral activity against both the Hepatitis A and Hepatitis B viruses in animal studies. Previous versions of DHQs showed harmful effects outside of the liver, but the Du Lab modified this version so that uptake is mediated by liver-specific organic anion transporters (OATP1B1-B3), which enhances liver targeting and reduces exposure to other tissues. The study was published in May 2025 in ***Antiviral Research***.

Redesigning DHQs with PROTAC strategy

The Du lab is exploring an additional antiviral strategy by chemically redesigning DHQs using PROTACs (proteolysis targeting chimeras). PROTACs are specialized molecules that prompt a cell to break down a specific protein and eliminate it instead of just blocking it. Earlier DHQ compounds were known to block Polymerases 5 and 7 (PAPD5/7), enzymes involved in the replication of hepatitis A virus (HAV) and hepatitis B virus (HBV), but the Du Lab chemically modified DHQs using PROTACs which degraded and removed PAPD5.

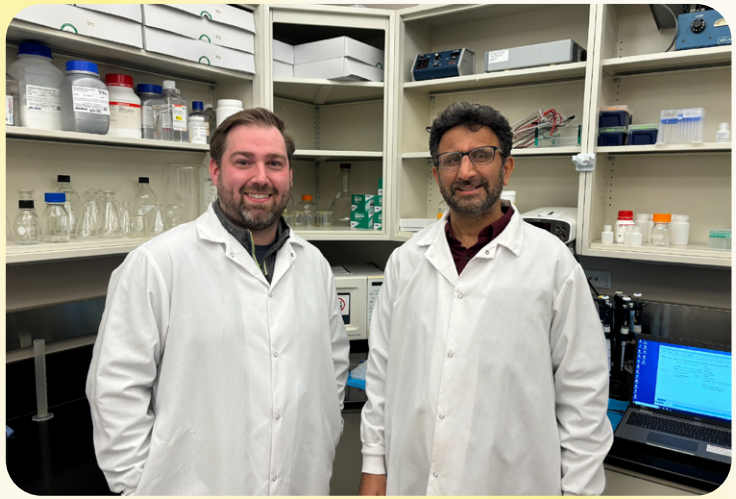
This study, published in 2024 in ***Bioorganic & Medicinal Chemistry Letters***, provides proof-of-concept that PROTACs may offer a new approach to suppressing HAV and HBV in early-stage research models.

Dr. Du, in collaboration with Hepatitis B Foundation, Blumberg Institute and Pennsylvania Biotechnology Center Co-Founder and Distinguished Professor Dr. Timothy M. Block and Professor Dr. Dimitar Gotchev also published a review on the current state of small-molecule HBV RNA destabilizing agents, such as DHQs, that inhibit Poly-adenylating PAPD5/7 in December 2025 in ***Antiviral Research***.

The Du lab is also continuing groundbreaking work on compounds to treat yellow fever virus with the Chang Lab and the Blumberg Institute's president and chief scientific officer, Dr. Ju-Tao Guo.

Ongoing projects:

- **Novel capsid assembly modulators**
- **RAD52 inhibitors used for triple negative breast cancer**
- **Benzodiazepines against yellow fever infection**



AEJAZ SAYEED LAB

Aejaz Sayeed, PhD, is an associate professor and director of the Sayeed Lab, which is working to detect and track cancer as early as possible using genetic signals found in the blood, reducing the need for invasive procedures.

Research team: Timothy M. Block, PhD, distinguished professor; Cinnee Liu; Daniel Zezulinski

Ongoing projects:

- Discovery of variant circulating RNA profiles associated with early- and late-stage of hepatocellular carcinoma patients.
- Investigating the ctmutRNA variant profiles using total RNAseq in serially collected plasma samples from CLD patients with small LIRADS 3 (LR3) and LIRADS 4 (LR4) lesions detected on dynamic contrast enhanced cross sectional imaging.
- Neoantigen Discovery for Oncology Therapeutics.
- Investigation of variant profiles in matching RNA and DNA samples from HCC tumors and adjacent cirrhotic tissue.

New discovery in potentint of antiviral compound

The Sayeed Lab is developing a highly specialized blood test, also known as a liquid biopsy, to detect liver cancer at its earliest stages. The test uses circulating tumor RNA (ctRNA), tiny fragments of genetic material released by cancer cells into the bloodstream. The lab analyzes ctRNA to identify specific genetic mutations and abnormal levels of RNA that are associated with cancer.

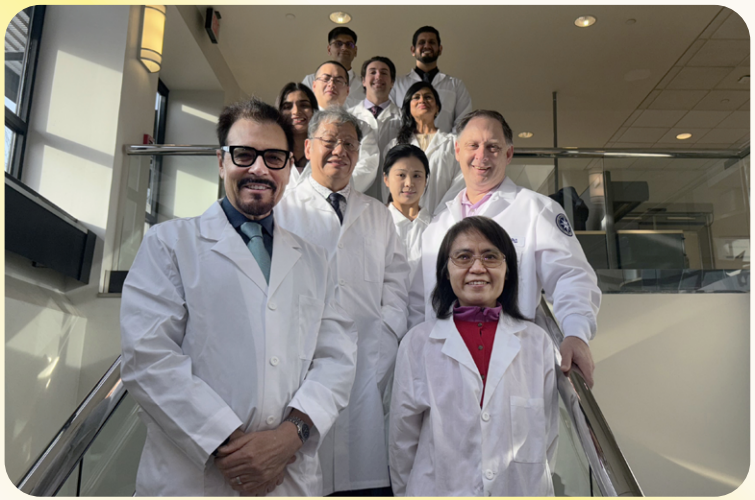
The team has studied blood samples from hundreds of people with and without cancer. By extracting and sequencing ctRNA from blood plasma, they identified cancer-specific mutations and unusually high levels of certain ctRNAs in people with cancer. They then developed laboratory tests to detect these cancer-related ctRNA changes and confirmed that the same abnormalities are present in both tumor tissue and blood samples.

In addition to detecting cancer early, this ctRNA-based platform could also be used to monitor patients in real time during treatment. It may also help identify new drug targets, supporting the development of more personalized cancer therapies. The Lab is also investigating whether mutations found in ctRNA lead to altered protein fragments that the immune system can recognize. If confirmed, these altered proteins (called neoantigens) could potentially be used to develop cancer vaccines.

The team is now extending these ctRNA investigations to breast and pancreatic cancers as well, in collaboration with Capital Health Cancer Center.

Validation of ctmutRNA in 100 patient plasma samples by targeted RNAseq

The laboratory validated hepatocellular carcinoma (HCC)-associated circulating tumor RNA mutations (ctmutRNA) in a study of 100 patient blood samples using targeted RNA sequencing. In earlier work, the team identified approximately 1,500 high-risk RNA variants in patients with HCC compared to controls. From these, they selected the 250 most frequent and clinically relevant mutations for further study. Using a new group of patients, including people with early-stage HCC, late-stage HCC, and liver cirrhosis without cancer, the team analyzed blood samples with targeted sequencing. This method allows for deeper and more precise detection of specific mutations. Some tumor tissue samples were also analyzed and confirmed that the mutations identified in blood reflected those present in the tumors. These findings strengthen the clinical potential of ctmut-RNA-based liquid biopsy for non-invasive detection of HCC and support further development of circulating RNA panels for early cancer diagnosis and surveillance. The study was published in ***Liver Cancer*** in April 2025.



RICHARD PESTELL LAB

Richard Pestell, distinguished professor, AO, MB, PhD, MD, FRACP, Doctorus Honoris Causa, DMedSci, FACP, FAAAS, FRSB, MBA, FRCP, MA. The Pestell laboratory develops cancer diagnostics and therapeutics, defining mechanisms of disease and translating findings to the clinic.

Research team: Richard G. Pestell, Ritika Harish, Xuanmao Jiao, Danni Li, Zhiping Li, Anthony Ashton

Congratulations, Dr. Pestell!

In May of 2025, Dr. Pestell was elected to membership in the Hungarian National Academy of Sciences. Honorary Members of the Hungarian National Academy of Sciences are individuals, including both Hungarian and foreign scholars, who are recognized for their outstanding contributions to science and are elected for life.

The mechanisms governing cell-cycle control and tumorigenesis (via the cyclin D1 and DACH1 genes)

The Pestell lab's preclinical studies of cyclin D1, a cell-cycle regulator often overexpressed in breast cancer, are cited the basis for clinical trials of cyclin-dependent kinase (CDK) inhibitors. CDK inhibitor drugs are now approved by the FDA and are the standard of care worldwide for the most common types of breast cancer. Despite their effectiveness, drug resistance can emerge with ongoing tumor cell proliferation and increasing chromosomal instability. The team currently is defining mechanisms of drug resistance, including mitochondrial aging, asymmetrical cellular divisions, and heterotypic secretomes; identifying non-canonical functions of cyclin D1 that drive drug resistance and developing new therapeutic targets aimed at a region of cyclin D1 to limit chromosomal instability.

Epidemiological studies of cancer

The Pestell Lab participates in collaborative epidemiological studies through the Global Burden of Disease consortium. In 2024 and 2025 the Lab has been a part of published papers on global fertility, burden of 288 causes of death, stroke, effects of smoking, cancer and central nervous system cancer. These studies provide contextual and comparative data to inform public health responses such as policy, resource allocations and disease prevention programs.

The mechanisms by which CCR5 governs tumorigenesis and therapy responses

The Pestell Lab's preclinical studies of CCR5 inhibitors are cited as the basis for current clinical trials of CCR5 inhibitors for cancer. Pestell wrote, obtained Fast Track Designation, and helped raise funds for a study of CCR5 inhibitors in heavily pretreated patients with metastatic triple-negative breast cancer. www.onclive.com/view/fda-grants-fast-track-designation-to-leronlimab-for-metastatic-tnbc. These studies have shown remarkable promise as 17.8% are alive with a median 64-month survival. Recent ongoing studies from the Pestell Lab have shown CCR5 contributes to immune check point inhibitor resistance in patients with triple negative breast and other cancers https://aacrjournals.org/cancerimmunolres/article/13/9_Supplement/B019/765409. Collaborative studies are examining the molecular mechanisms.

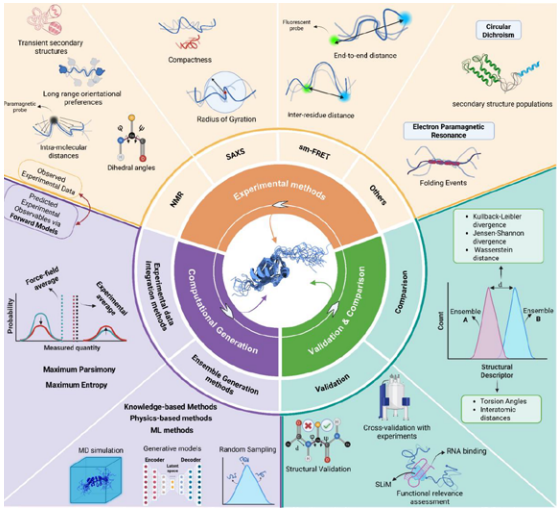


Figure. Ghafouri, H., Towards a Unified Framework for Determining Conformational Ensembles of Disordered Proteins, *Nature Methods*, 2026

CUCONATI AND GOTCHEV LABS

Andrea Cuconati, PhD, professor and director of academic development, studies potential inhibitors against emerging viruses, the biology and inhibition of the hepatitis B virus surface antigen (HBsAg) production, and the diagnosis and treatment of mast cell disorders of the immune system; assisted by Pengfei Zhu, MD, PhD.

Dimitar Gotchev, PhD, professor of antiviral drug discovery and development, is interested in advancing the next generation of antiviral agents for coronavirus, dengue virus and other diseases with unmet medical need.

As long-time colleagues in commercial drug development, Dr. Cuconati and Dr. Gotchev bring valuable new perspectives to the Blumberg Institute.

Discovery and development of new small molecule antiviral for coronaviruses

Together the Cuconati and Gotchev labs have discovered novel small molecule antiviral compounds to target the coronavirus main protease, an enzyme that is essential for virus life cycle and replication. These molecules offer much improved pan-coronavirus properties and maintain activity against nirmatrelvir-resistant mutants, thus providing a broad-spectrum potential and greatly increasing our preparedness against the emergence of novel human coronaviruses. They also engage in a non-covalent fashion with the target, which could provide an improved safety and tolerability profile to the approved drug Paxlovid.

TryptaBio

Dr. Cuconati, Dr. Gotchev and the Pennsylvania Biotechnology Center's entrepreneur in residence Nick Spring, collectively founded TryptaBio. The company aims to develop first-in-class products to diagnose and treat hereditary α-tryptasemia (HαT). The disease may affect up to 7% of the U.S. and global population and is caused by elevated blood levels of α-tryptase, often causing unexplained severe allergic and inflammatory symptoms.

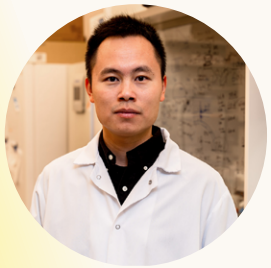
Gotchev Lab in collaboration with Dr. Jinhong Chang initiates a dengue antiviral program

There are no approved antiviral drugs for dengue virus despite World Health Organization estimates that half of the world's population is at risk, with approximately 100-400 million infections each year. The two laboratories started a program targeting dengue virus inhibitors of the NS2B-NS3 protease, with coverage against all four serotypes. Dengue is part of the flavivirus genus, with other members being West Nile, yellow fever, Japanese encephalitis, and Zika. The laboratories plan to expand their approach to identifying protease inhibitors to the other flaviviruses in the future.

Cuconati Lab and Dr. Ju-tao Guo Lab designing HBsAg inhibitors

In a collaboration with Dr. Ju-Tao Guo, the Institute's president and chief scientific officer, the team is utilizing cutting-edge principles in protein structure and bioinformatics to discover new ways of designing potential inhibitors of HBsAg production. Clinical research has confirmed that high blood levels of HBsAg are responsible for limiting the body's immune response against chronic HBV infection, so the development of new orally-administered drugs would restore immunity and raise cure rates.

LIUDI TANG LAB



Liudi Tang, PhD, assistant professor of experimental therapeutics, focuses on understanding persistent hepatitis B virus infection and developing gene editing technologies aiming to cure chronic Hepatitis B.

Research team: Andrew Snedeker, Liren Sun

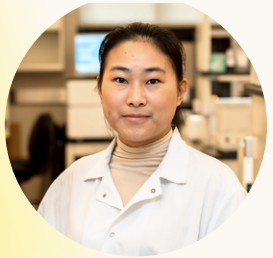
Conducting unbiased genome-wide screens to identify key interactions between HBV and liver cells

The Tang lab is studying essential host gene functions hijacked by hepatitis B virus (HBV) that are crucial for the establishment and maintenance of its infection. Instead of using the one-gene-at-a-time approach, they are conducting unbiased genome-wide screens to identify key interactions between HBV and liver cells. This study is enabled by their recent development of a new HBV RNA sensing system, the HBV-reprogrammable adenosine deaminase acting on RNA sensors (HBV-RADARS), which allows selection of HBV-infected cells. This ongoing study has the potential to strengthen our understanding of HBV virology, identify host-encoded antiviral targets, and ultimately advance the efforts toward a functional cure for chronic HBV infections.

Evaluating the restoration of SMC5/6 mediated transcriptional silencing of hepatitis B virus DNA through HBx-targeting agents

The Tang lab is also studying the role of HBV X (HBx), a protein which the HBV needs to replicate. HBx breaks down the structural maintenance of chromosomes SMC5/6 complex, which otherwise recognizes and restricts transcription from HBV cccDNA as well as other viruses with extrachromosomal (episomal) circular DNA genome. This research looks at how HBx is regulated inside the cell and how it affects viral DNA under different physiological conditions. Understanding this process will shed light on new medicine discoveries that block HBx, allowing SMC5/6 to keep HBV suppressed for the long term.

QIONG ZHAO LAB



Qiong Zhao, PhD, assistant professor, studies mechanisms of hepatitis B virus (HBV) replication. The lab developed a new HBV replication system in 2022 leading to discoveries around double-stranded linear DNA (dslDNA).

Determining the molecular pathways of dslDNA-derived cccDNA synthesis

HBV covalently closed circular DNA (cccDNA)—a ring-shaped DNA molecule of HBV that acts like a minichromosome—is a main cause of long-term hepatitis B infection. When HBV replicates, a minor byproduct called dslDNA is formed, in addition to a major bybroduct called relaxed circular DNA (rcDNA). Both byproducts can form new cccDNA, but unlike rcDNA, dslDNA-derived cccDNA is not considered to support further viral replication because of errors in the repair process. However, with the Zhao Lab's HBV replication system, the team discovered that dslDNA is repaired more accurately and turned into functional cccDNA than previously thought. They are now investigating how cells decide which DNA repair pathway to use during the synthesis of cccDNA, which may help reveal new strategies to target chronic HBV infection.

Developing a CRISPR/Cas9 based anti-HBV gene therapy using LgRNA

Working together with Ju-Tao Guo, MD, president and chief scientific officer, and Minghong Zhong, PhD, adjunct professor, the team is developing a novel gene therapy for HBV using CRISPR/Cas9 technology. The approach uses a new type of guide RNA called LgRNA, which is made by joining two or three short RNA pieces together using a unique chemical method. They have demonstrated that LgRNA can target both the HBV integrated genome and cccDNA, showing promising gene editing efficiency and antiviral efficacy on HBV on multiple layers compared to classical single-guide RNA (sgRNA).

HEPATITIS B FOUNDATION | BARUCH S. BLUMBERG INSTITUTE

The Hepatitis B Foundation's valuable research and programs are made possible by the commitment of our donors. We are grateful to every individual and organization that has generously supported our mission to find a cure and improve the quality of life for those affected by hepatitis B worldwide.

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Your donation saves lives.

The Truth Matters

The core of our work at the Hepatitis B Foundation and Baruch S. Blumberg Institute is based on a rock-solid foundation built on truths provided by science and data.

For example, there have been more than **1.4 billion doses** of the hepatitis B vaccine given in this world. How might one place the number 1.4 billion in context? By population estimates in 2025, that number roughly equaled the population of India, or the population of China. Within the United States, since the inclusion of the birth dose of this vaccine, childhood hepatitis cases have decreased by **99%**.

Fact: **vaccines = saving lives**.

During 2025, we witnessed attacks on the hepatitis B vaccine that led to its removal from the ACIP's universal childhood recommendations in the U.S. This will lead to more infections and ultimately more deaths. This will cause an increase in hepatitis B rates, liver disease and liver cancer.

The Hepatitis B Foundation has been at the forefront of the fight to save the hepatitis B vaccine and ensure that babies and children in the U.S. will still be protected from this cancer-causing virus.

So, how have your gifts impacted our work and advanced our mission?

Thanks to your support, Foundation experts were quoted in more than **88** unique stories in media outlets such as the *New York Times, Wall Street Journal,* and *ABC News*. We were able to mobilize storytellers from around the country to talk with journalists and led hundreds of oral and written comments to the ACIP and CDC in 2025. Our vaccine and screening programs continued to grow, focused on underserved communities and linkage to care.

The Foundation also now has a funded **Lu-Yu Hwang and Palmer Beasley Public Health Fellow**, focused on expanding our efforts to prevent, diagnose and treat hepatitis B, with an emphasis on Africa, where we have positively influenced vaccination, discrimination and treatment access policies. This position is the result of a major gift from Foundation Board Member Dr. Lu-Yu Hwang and will be filled by Catherine Freeland, Ph.D., associate director of public health research.

The Blumberg Institute now has the **Harvey Alter** chair, named in recognition of Dr. Alter's outstanding career and service. This position is funded in large part due to a major gift from The Raymond F. Schinazi Family Foundation and will be filled by Dr. Jinhong Chang, our VP of Drug Development. Dr. Schinazi is a member of our Scientific and Medical Advisory Board.

Thank you to each donor in this report for investing in science and in truth.

With sincere gratitude for your support of our mission,

Joe Erckert, Alaina Schukraft and Brooke Walsh
Your Hepatitis B Foundation and Baruch S. Blumberg Institute development team

Year in Review

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FOR THE FISCAL YEAR ENDED JUNE 30, 2025

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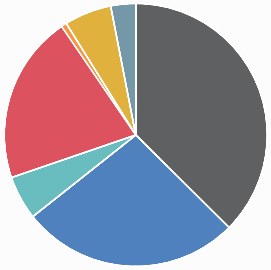
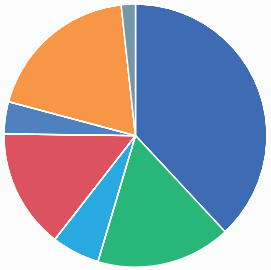


Grants	$1,236,661	37%
Charitable Contributions***	$ 888,336	27%
Management Fees	—	—
Special Events	$ 178,860	5%
HBV Meeting	$ 684,246	21%
Other Revenue	$ 21,907	1%
Gain on Sale of Investment	$ 191,971	6%
Investment income**	$ 101,099	3%
Total Revenue	**$3,303,080**	

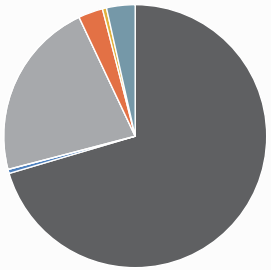
Use of Funds



Public Health	$ 1,175,338	38%
Outreach and Education	$ 510,582	17%
Policy & Advocacy	$ 182,297	6%
HBV Meeting	$ 453,813	15%
Academics & Events	$ 121,930	4%
Support Services****	$ 589,894	19%
Rent	$ 53,470	2%
Total Expenses	**$3,087,324**	

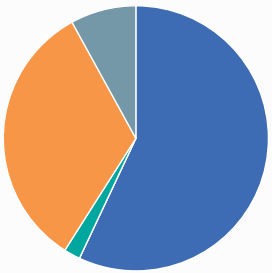
THE BARUCH S. BLUMBERG INSTITUTE

Source of Funds



Grants	$ 9,805,351	71%
Charitable Contributions***	$ 43,929	<1%
Management Fees	$ 3,038,576	22%
Special Events	$ –	–
Research Meeting	$ –	–
Other Revenue	$ 418,125	3%
Gain on Sale of Investment	$ 39,489	<1%
Investment income**	$ 495,046	4%
Total Revenue	**$13,840,516**	

Use of Funds



Research	$ 8,037,763	57%
Outreach and Education	$ 297,113	2%
Support Services	$ 4,742,510	33%
Rent	$ 1,208,518	8%
Total Expenses	**$14,285,794**	

* The financial information presented above does not include the activity from Hepatitis B Foundation's ownership of the net assets of the Pennsylvania Biotechnology Center. At June 30, 2025, this interest was valued at, based on the equity method of accounting, approximately **$14,727,464** per the audited Statement of Financial Position of the Hepatitis B Foundation.

** The financial information presented above excludes unrealized investment-related activities.

*** Excludes in-kind donations

**** Support Services use of funds $589,894 has been netted with management fee revenue.

The financial information in this report was prepared by management and presented in condensed form from the financial statements of the Hepatitis B Foundation and the Baruch S. Blumberg Institute audited by EisnerAmper, LLP for the year ended June 30, 2025. A copy of each financial statement is available upon request.

The Hepatitis B Foundation (HBF) was established in 1991 and remains the world's only nonprofit organization solely dedicated to finding a cure for hepatitis B and improving the quality of life for those affected by hepatitis B and D, and liver cancer worldwide through research, education and patient advocacy. The Foundation established the Baruch S. Blumberg Institute (BSBI) in 2003 as an independent, nonprofit research institute to fulfill its research mission. BSBI is a world-class virology and cancer biology research organization comprising experienced leaders from academia and industry skilled in drug discovery and development.

IN MEMORIAM
Baruch S. Blumberg, MD, DPhil, Nobel Laureate
W. Thomas London, MD
William S. Mason, PhD
Edith Mitchell, MD
Bud Tennant, DVM
Bud Tennant, DVM
Paul Witte, Co-founder

HEPATITIS B FOUNDATION | BARUCH S. BLUMBERG INSTITUTE

3805 OLD EASTON ROAD, DOYLESTOWN, PA 18902 USA
PHONE +1(215) 489-4900
WWW.HEPB.ORG • INFO@HEPB.ORG
WWW.BLUMBERGINSTITUTE.ORG

/hepbfoundation
@hepbfoundation
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