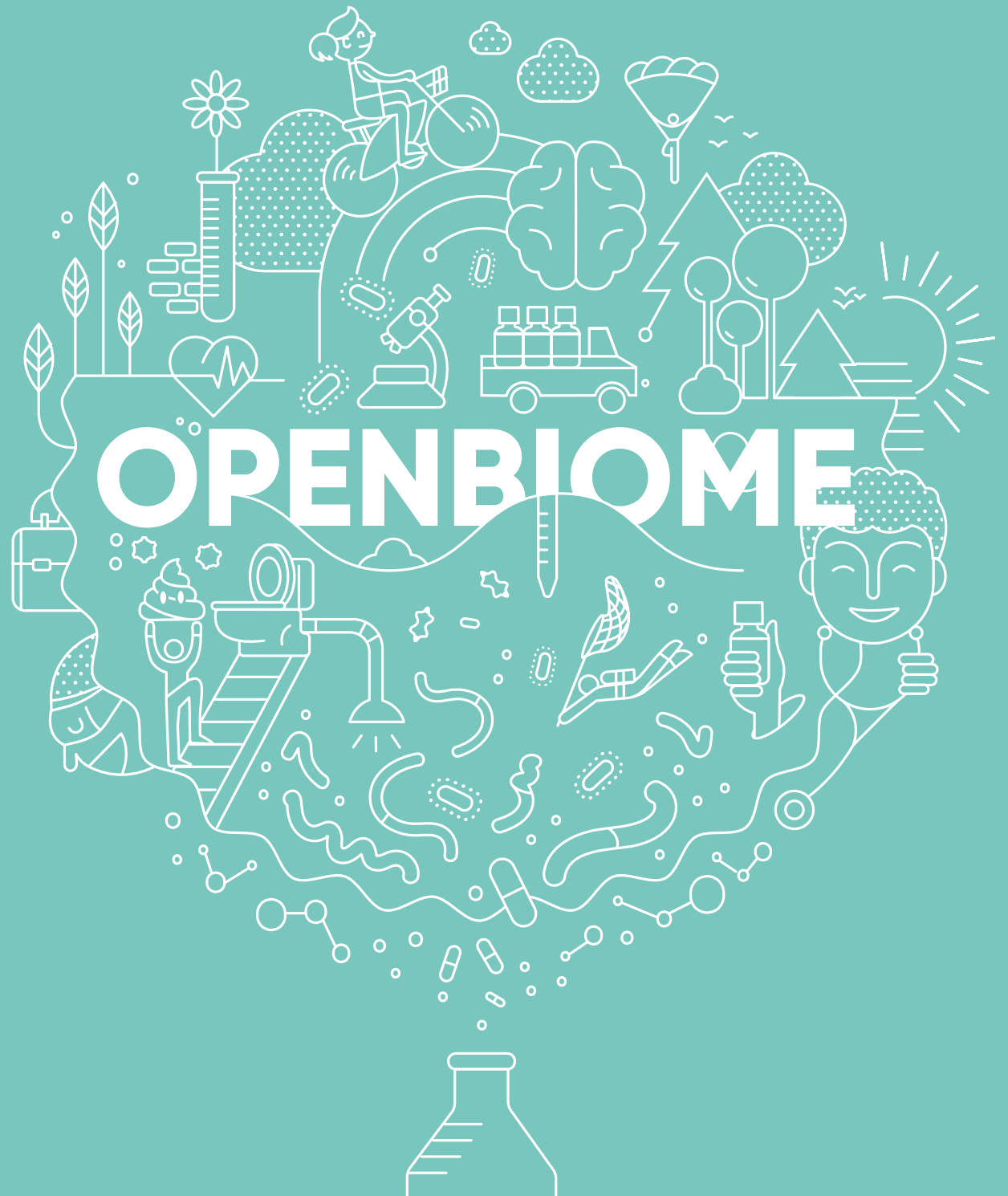
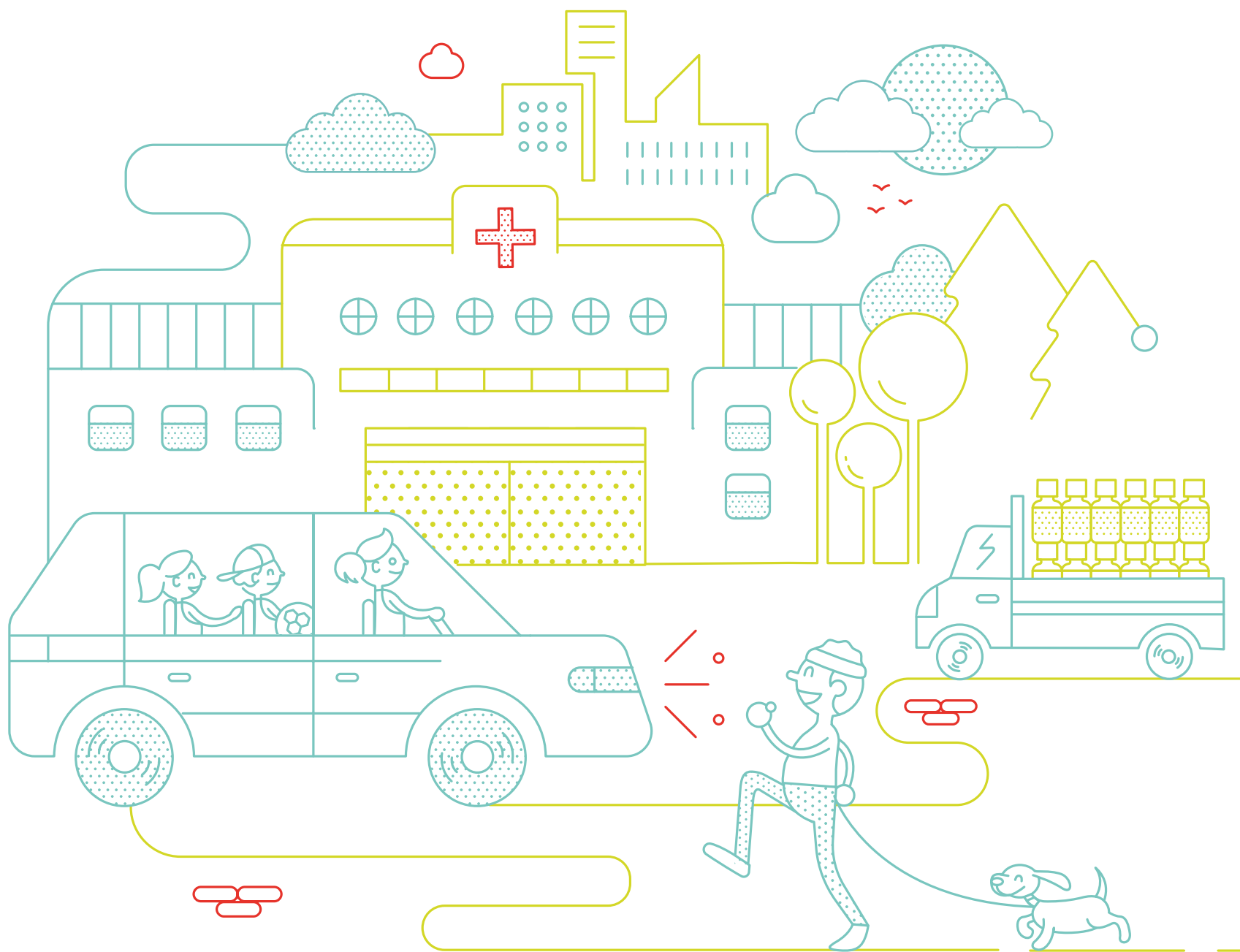
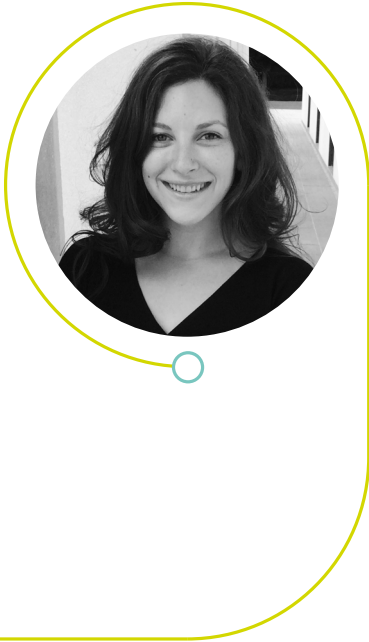

Annual Report 2017





Welcome



This year saw significant change for OpenBiome. In itself, this was not unusual for our startup organization, but these changes carried deep implications for our future. We spun out – and then in early 2017, partnered with – a new mission-driven biopharmaceutical company, and we announced the creation of our research initiative in global health. Together, these two steps marked an inflection point in our history.

OpenBiome launched in 2013 as a stopgap solution: research studies were showing that fecal microbiota transplantation (FMT) was a promising treatment for *Clostridium difficile*, and we wanted to help make it safe and accessible while drug companies focused on developing next-generation treatments. Since then, we've sent out just over 30,000 fecal microbiota preparations across the country, providing tens of thousands of people access to a therapy that could give them their lives back. Today, 98% of the U.S. population lives within a two-hour drive of a hospital or clinic offering FMT.

Despite the widespread adoption of FMT, patients are still struggling. This December, I received a letter from a healthcare executive whose life was upended by a recurrent *C. difficile* infection. Even though she had the financial resources and personal network to overcome many hurdles that most patients face, it still took months for her to receive treatment. Because this therapy is not approved by the FDA, most patients must first try antibiotics several times before they are eligible to receive FMT, and must cover the cost out-of-pocket. We have always believed that an FDA-approved product is the best option for patients in the long run, but as we waited, the timeline to that future extended well beyond what we originally imagined.

In response, OpenBiome spun out a new biotechnology group called Finch Therapeutics, which will work towards FDA approval of a freeze-dried fecal microbiota pill. Finch will also serve as OpenBiome's contract manufacturer,

producing all of the treatments we offer in an upgraded quality environment. In 2017, Finch began enrolling patients in a clinical trial to evaluate the safety and efficacy of these pills. This work is our way of validating the access that patients have to FMT today, and ensuring that it will continue in perpetuity.

Working with Finch will also help OpenBiome transition to a future when treatment of *C. difficile* no longer relies on stool banks. We have an enduring mandate to fulfill the second half of our mission: to catalyze the development of new microbiome-based therapies that could transform public health. Looking to this future, we are beginning 2018 by emphasizing our role as a research institute. We are already collaborating on 21 trials investigating whether changing the microbiome can affect a variety of illnesses, from inflammatory bowel disease to food allergies to multiple sclerosis. This year, we launched the **Global Health Microbiome Initiative** to focus our resources on diseases that have ties to the microbiome but are being neglected because they predominantly affect patients in low- and middle-income countries. Our first study under this initiative will test whether FMT can aid in a child's recovery from severe acute malnutrition.

In this report, we detail our progress towards ensuring safe access to FMT and exploring the therapeutic potential of the microbiome to improve human health on a global scale.

Thank you for your support and your engagement with OpenBiome,

Carolyn Edelstein

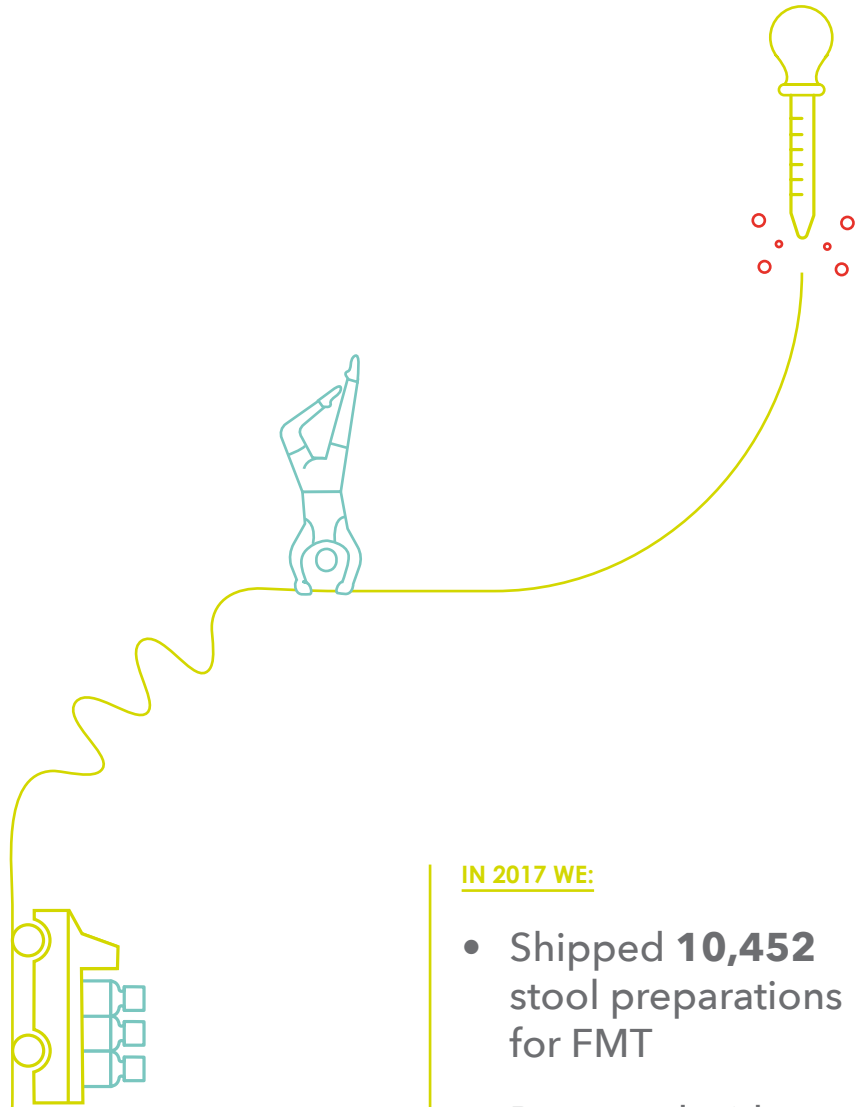
Patient Treatment

"I never thought I was going to feel good again. ...

It is now Saturday, not even three full days after the transplant, and I feel like a new person. I actually got dressed today and went to the store to run errands. I haven't been able to do that in months. ...

I was on so many different medicines, and none of the antibiotics were working. ... My kids were in tears all the time because they wanted me home [from the hospital]. ...The fecal transplant was our last hope. I was ready to try anything. I needed to get my life back."

— Amy



IN 2017 WE:

- Shipped **10,452** stool preparations for FMT
- Partnered with **197** hospitals

OVERALL, WE HAVE:

- Shipped **30,331** FMT units to a network of **985** hospitals

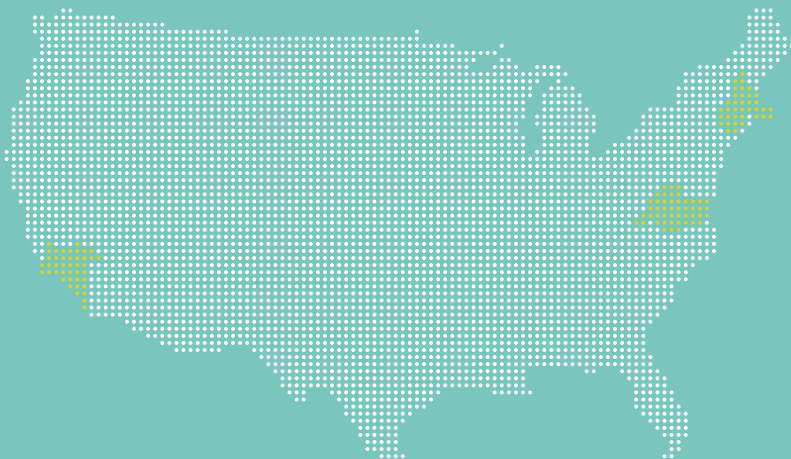
Providing Safe Access to Fecal Transplantation

We believe that every *C. difficile* patient should have safe and affordable access to fecal microbiota transplantation (FMT). To accomplish this goal, we provide rigorously screened stool preparations to a network of physicians around the United States.

OPENBIOME & THE FMT NATIONAL REGISTRY

To answer some of the biggest questions about the burgeoning field of microbiome-based therapies, OpenBiome has partnered with the American Gastroenterological Association (AGA) and the American Gut Project on the Fecal Microbiota Transplantation National Registry. The registry, which aims to track 4,000 patients for ten years after their FMT procedure, is planned to be the largest observational FMT study in history. The wealth of data generated by the registry will allow clinicians to evaluate the short-term and long-term effects of FMT, and inform patients, clinicians, and researchers on the risks and benefits of the treatment.

2013

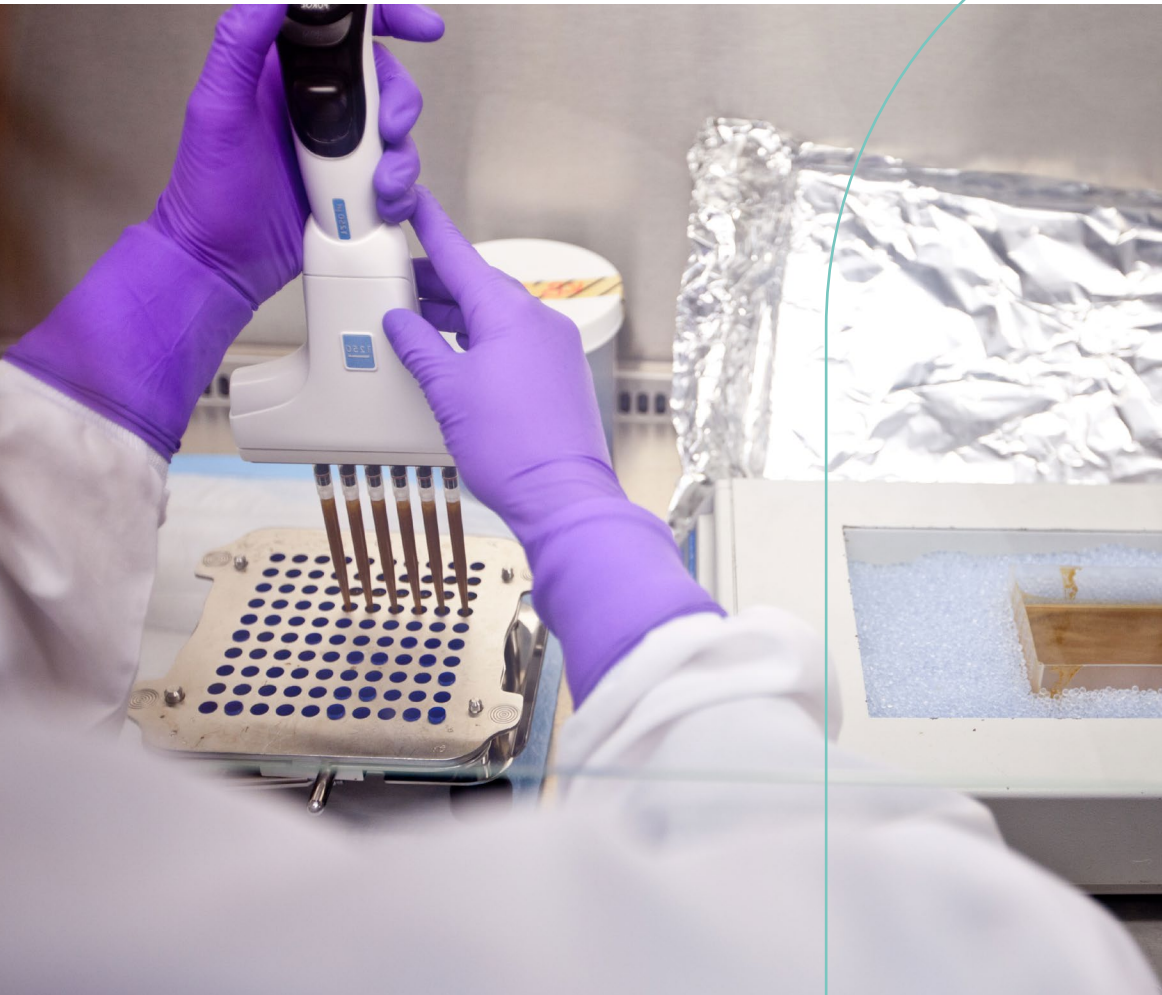


2017



From 2013 to 2017, the percentage of the U.S. population living within a 2-hour drive of an FMT provider increased from **11%** to **98%**.

OpenBiome and Finch Collaboration



BUILDING A LONG-TERM SOLUTION: THE OPENBIOME & FINCH COLLABORATION

In 2017, OpenBiome spun out Finch Therapeutics – a new, mission-driven biotechnology company that is working to bring microbiome-based treatments to patients. To realize the public health potential of this new field of medicine will require commercial development as well as nonprofit research. The Finch and OpenBiome collaboration will allow us to execute our mission at a level we could not have imagined.

SECURING PERPETUAL ACCESS TO FMT FOR *C. DIFFICILE*

Since 2012, OpenBiome has worked to expand access to FMT while also recognizing that the procedure is a temporary solution to an urgent healthcare issue. Though FMT has been shown as a promising treatment for recurrent *C. difficile* in studies to date, additional well-controlled trials demonstrating safety and efficacy must be completed before a product is approved by the FDA.

The agency currently allows doctors to perform FMT to treat recurrent *C. difficile* not responsive to standard therapies under an interim policy. As an investigational treatment, FMT is often not covered by insurance and many doctors struggle to bring an FMT program to their hospitals. In the long run, we believe that patients will be best served by an FDA-approved microbiome-based therapy to treat recurrent *C. difficile*.

To develop an FDA-approved therapy, we have partnered with Finch, a biotechnology company founded by a group of MIT and OpenBiome scientists. This mutually beneficial collaboration allows OpenBiome to support drug development while focusing our own resources and efforts on the pursuit of early-stage research and research on neglected patient populations.



HOW DOES THE COLLABORATION WORK?

OpenBiome has licensed our donor screening and material processing systems to Finch. In return, OpenBiome will receive milestone and royalty payments that will support our mission of guiding early-stage and high-risk research programs.

WHAT DOES THIS MEAN FOR PATIENTS AND CLINICAL RESEARCHERS?

Our collaboration with Finch has improved the services OpenBiome offers to patients and clinical researchers. Finch serves as OpenBiome's contract manufacturer, producing the treatments we provide in an upgraded manufacturing facility, allowing us to continue to ensure the safety and standardization of our stool preparations as demand grows.

HOW WILL OPENBIOME OPERATE WHEN THE FDA APPROVES A MICROBIOME-BASED THERAPY?

Once the FDA approves a microbiome-based drug for recurrent *C. difficile*, OpenBiome will focus on guiding clinical research. Over the past decade, a surge of exciting studies has suggested that the gut microbiome impacts many aspects of our health including metabolism, immunity, and behavior. Our plan is to reinvest funds from the Finch collaboration back into high-risk research projects aiming to treat large populations of underserved patients.

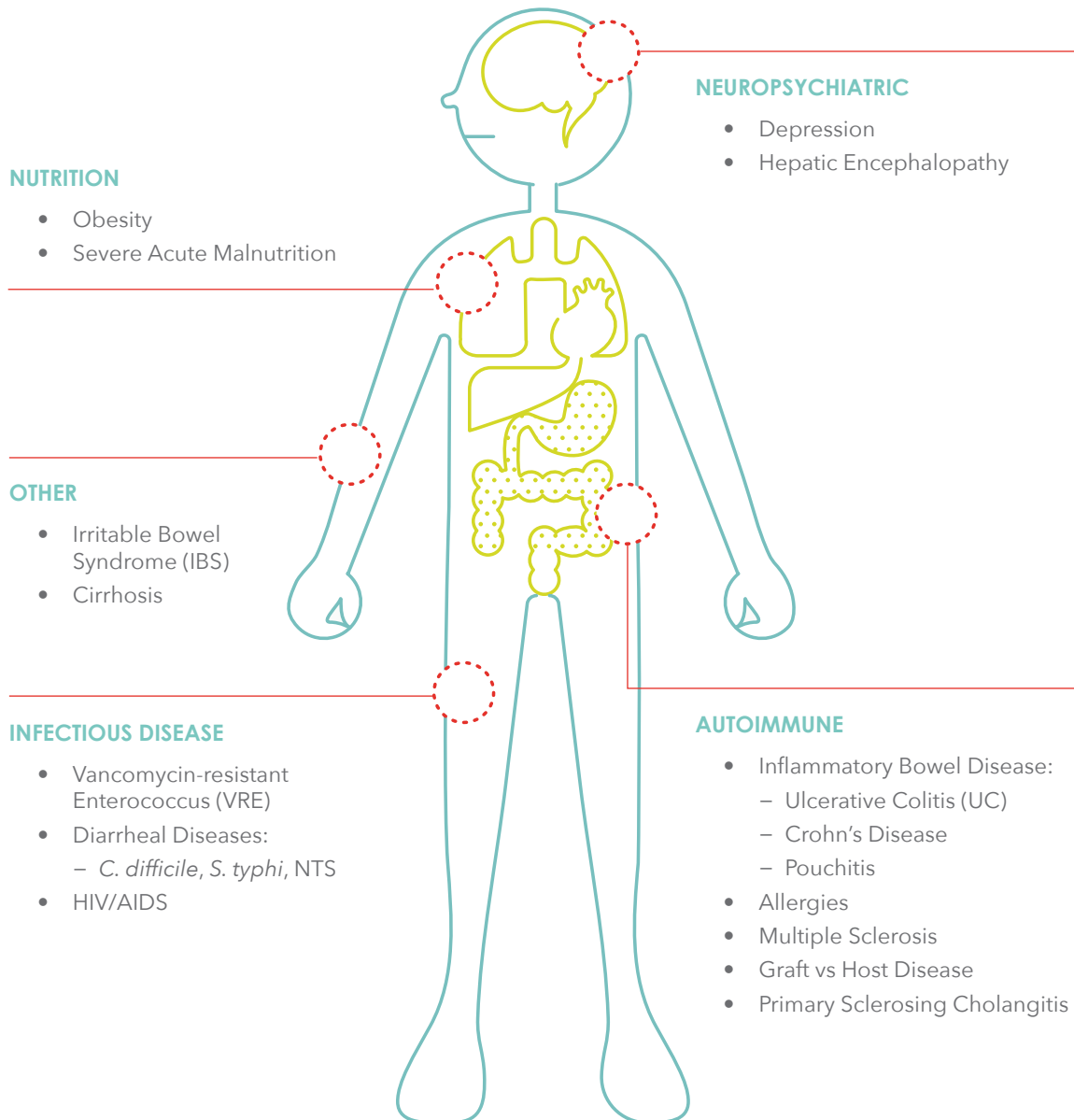


Research

Bacteria play a critical role in human health. They help us digest food, train our immune systems, and may even modulate brain function. Researchers – by transplanting bacteria from a healthy donor into a patient – are now testing whether a variety of diseases can be treated by engineering the microbiome.



OpenBiome works with researchers to investigate the role gut bacteria may play in the indications shown below:



OPENBIOME CATALYZES CLINICAL RESEARCH ON THE MICROBIOME

- **30** clinical trial collaborations
- **10** opened to enrollment in 2017
- **34%** of all active and completed FMT studies in the U.S. are associated with OpenBiome
- **22** authored or co-authored peer reviewed publications
- **14** abstracts presented at Digestive Disease Week, the annual meeting of the American Gastroenterological Association

In the past few years, groundbreaking studies have described associations between the microbiome and a wide variety of diseases including diabetes, multiple sclerosis, Alzheimer's disease, and autism.

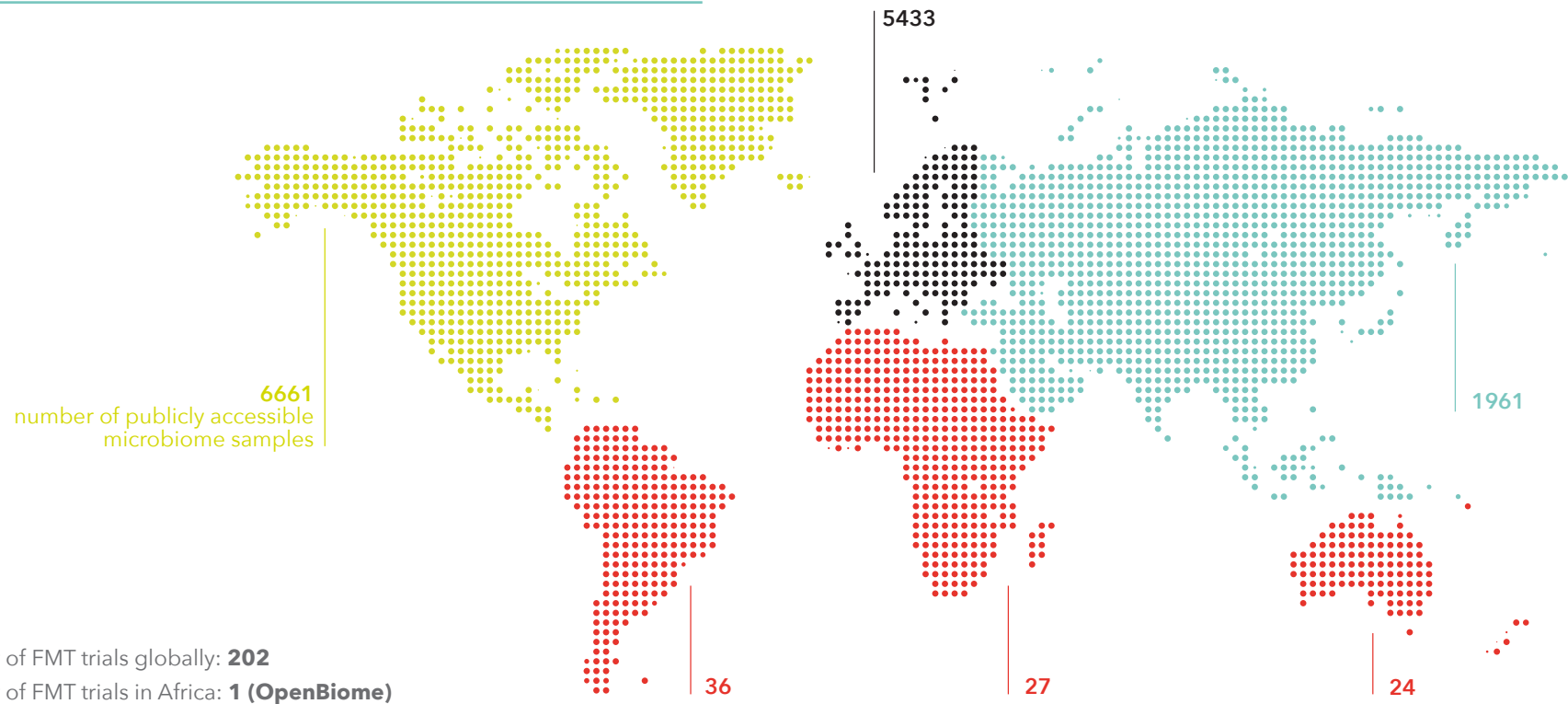
We support a broad network of researchers at leading academic institutions who are exploring the use of FMT in a wide range of indications. To investigators, we provide FMT preparations along with support on clinical trial design, safety review, and regulatory consultation. We also drive our own research, leading clinical trials in neglected diseases where compelling evidence indicates that engineering the microbiome could reverse disease. Using this approach, we are enabling novel research into microbiome-based therapies across the world.



Global Health Microbiome Initiative

Research on the microbiome and FMT has been predominantly focused on conditions that impact wealthy countries. By launching the Global Health Microbiome Initiative, OpenBiome is aiming to serve neglected patient populations and test whether FMT can treat conditions affecting primarily low- and middle-income countries. We are excited to apply the lessons we've learned from treating patients with recurrent *C. difficile* to address some of the greatest global health challenges.

WIDENING GLOBAL DISPARITY IN TRANSLATIONAL MICROBIOME RESEARCH



THE THRIVE STUDY: A PILOT INVESTIGATION OF THE MICROBIOME AND MALNUTRITION

Our inaugural global health study, Transfer of Healthy Gut Flora for Restoration of Intestinal Microbiota Via Enema for Severe Acute Malnutrition (THRIVE), will evaluate whether FMT can treat pediatric severe acute malnutrition (SAM).

- SAM stunts the growth of 20 million children, primarily from developing countries¹
- Over 35% of cases do not respond to the standard treatment of nutrient-enhanced foods²
- Each year, SAM causes 1 million deaths¹

Recent studies have suggested that severely malnourished patients who fail to gain weight after eating nutrient-enhanced food may lack the gut bacteria required to absorb nutrients. The THRIVE study will explore whether restoring the normal complement of bacteria, through FMT from a healthy donor, can aid the recovery of children with non-responsive SAM.

The study is supported by the Bill & Melinda Gates Foundation, Children's Relief International, and the Thrasher Research Fund. The study is on track to begin enrolling patients in 2018.

CRI Children's
Relief
International

BILL & MELINDA
GATES foundation

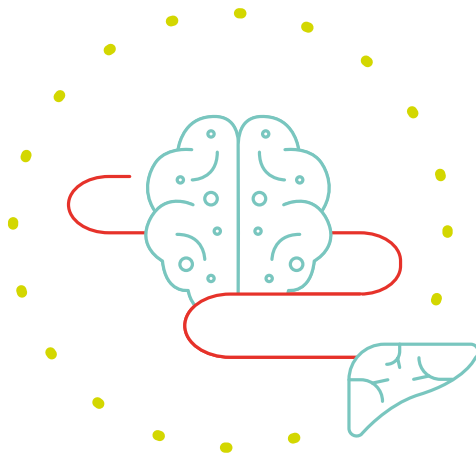
Thrasher Research Fund
Medical research grants to improve the lives of children

¹ Williams PCM, Berkley JA. Guidelines for the treatment of severe acute malnutrition: a systematic review of the evidence for antimicrobial therapy. *Paediatr Int Child Health*. 2018;38(sup1):S32-S49.

² Isanaka S, Langendorf C, Berthe F, Gnegne S, Li N, Ousmane N, et al. Routine Amoxicillin for Uncomplicated Severe Acute Malnutrition in Children. *N Engl J Med*. 2016;374(5):444-53.

Research Spotlights

Highlights from our research portfolio

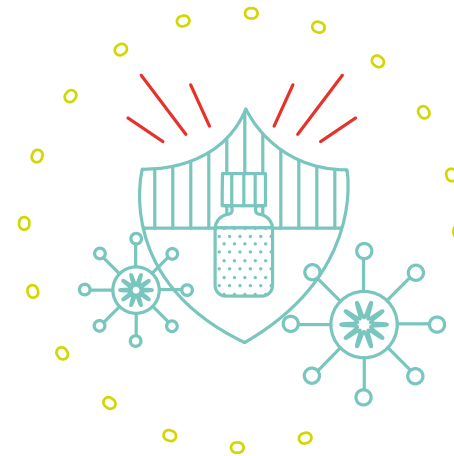


HEPATIC ENCEPHALOPATHY

Hepatic Encephalopathy (HE) is a debilitating brain condition that occurs in patients with advanced liver disease. When a patient's liver is damaged, it no longer removes toxins from the blood, causing them to accumulate in the brain. Symptoms of HE – confusion, sudden change in personality, and forgetfulness – put a major burden on caretakers. Each year, it costs up to seven billion dollars to hospitalize Americans with HE.

In 2017, OpenBiome collaborated with clinical researchers to demonstrate that FMT may help alleviate symptoms of HE. During this Phase I clinical trial, patients who received a single FMT experienced fewer hospitalizations and improved cognition compared to those who underwent standard treatment.

The results of this study, published this year in *Hepatology*, have sparked two subsequent pilot studies investigating hepatic encephalopathy and alcoholic cirrhosis.

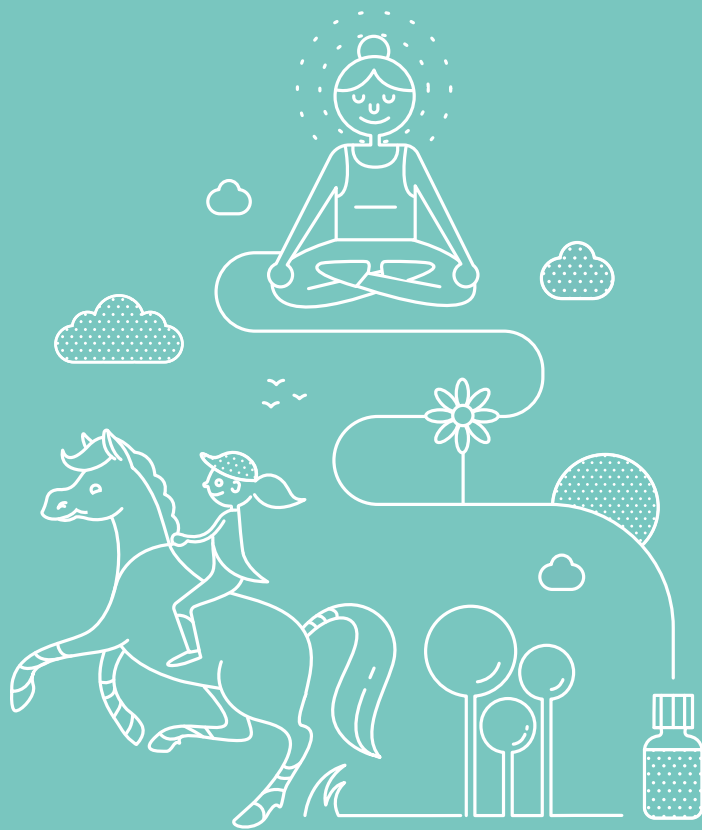


GRAFT VS. HOST DISEASE

OpenBiome material was used in the first pediatric case of gastrointestinal graft-versus-host disease (GI-GVHD) that was treated with FMT. The patient, a six-year old with acute myeloid leukemia, developed GI-GVHD after a hematopoietic stem cell transplant. During this medical complication, immune cells from the transplanted tissue attacked the patient's body. Doctors, inspired by research demonstrating that the microbiome modulates immune response, treated the patient with an FMT. His health began to improve within a week and he remained healthy throughout the six-month monitoring period.

The FMT in this case study was performed under a single patient investigational new drug application – an expanded access program offered by the FDA that allows doctors to use unapproved treatments for patients with serious or life-threatening conditions.

Patient Testimonials



“There is no way I can repay you for what you are doing for patients like me. So thank you from the bottom of my heart!”

— Angela

“I had C. diff 3 times. Every time I went off antibiotics I got it again two weeks later. Your treatments helped me get my life back. Thank you!”

— Shannon

“[My donor] potentially saved my life ... In a few weeks I was back working full time taking care of elite equine athletes, back doing yoga and running, currently training for a marathon and feeling better than I have in years. I am SO forever grateful as are my friends and family.”

— Deb

“Thank you, thank you so very much for saving my life. Had a fecal transplant on June 6, 2017. It took me a few months to regain my strength, but I am now feeling fantastic!”

— Judith

In the News



About Us



MISSION & HISTORY

OpenBiome's mission is to expand safe access to fecal microbiota transplantation for patients suffering from recurrent *C. difficile* infection and to catalyze research on the human microbiome.

Founded in 2012 in the Alm lab at MIT, OpenBiome aims to reduce the practical barriers to providing FMT and enable translational research investigating new applications of microbiome-based therapies.

BOARD OF DIRECTORS

Jim Burnham - *Chairman of the Board*

James Burgess - *President*

Eric Alm, PhD

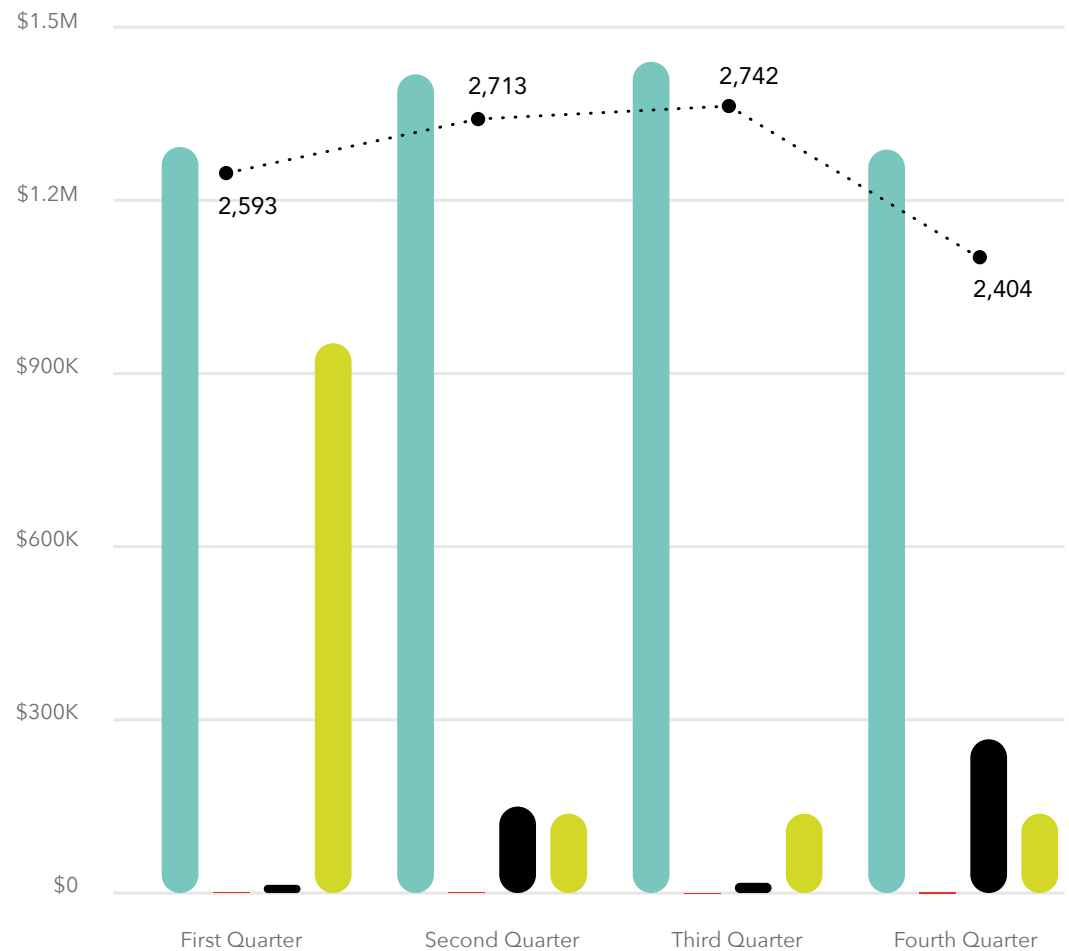
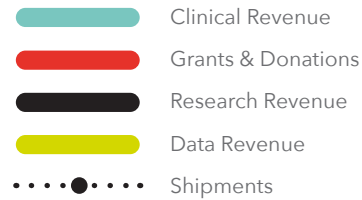
Jim Bildner, JD

Neil Rasmussen

Mark Smith, PhD

Jane Williams, MD MPH

Quarterly Growth



Financials

January —December 2017

BALANCE SHEET

Assests	
Current Assets	
Cash	\$ 2,629,916.00
Accounts Receivable	\$ 852,797.00
Inventory	\$ 313,815.00
Prepaid Expenses	\$ 59,783.00
Total Current Assets	\$ 3,856,311.00
Non-Current Assets	
Property and Equipment, net	\$ 26,151.00
Security Deposits	\$ 167,602.00
Total Assets	\$4,050,064.00
Liabilities and Net Assets	
Current Liabilities	
Accounts payable	\$ 702,394.00
Net accounts payable related party	\$ 171,982.00
Accrued expenses	\$ 391,558.00
Current portion of note payable	\$ –
Current portion of capital lease payable	\$ 5,672.00
Total Current Liabilities	\$ 1,271,606.00
Non-Current Liabilities	
Capital Lease Payable	\$ 16,652.00
Total Liabilities	\$ 1,288,258.00
Net Assets	
Unrestricted	\$ 2,761,806.00
Temporarily Restricted	\$ –
Total Net Assets	\$ 2,761,806.00
Total Liabilities and Net Assets	\$ 4,050,064.00

INCOME STATEMENT

	Unrestricted	Temporarily Restricted	Total
Unrestricted Operating Revenues and Support			
Sales of Product (net of discounts)	\$ 4,851,390.00	\$ –	\$ 4,851,390.00
Research Sales			
General Research	\$ 61,282.00	\$ –	\$ 61,282.00
Government Contracts	\$ 368,433.00	\$ –	\$ 368,433.00
Private Grants	\$ 2,349.00	\$ 17,148.00	\$ 19,497.00
Shipping and Handling Fees	\$ 587,400.00	\$ –	\$ 587,400.00
Less cost of clinical program sales	\$ (2,388,298.00)	\$ –	\$ (2,388,298.00)
Gross profit on sales	\$ 3,482,556.00	\$ 17,148.00	\$ 3,499,704.00
Data licenses and royalties	\$ 1,365,000.00	\$ –	\$ 1,365,000.00
Other Income	\$ 13,377.00	\$ –	\$ 13,377.00
Other Donations	\$ 3,526.00	\$ –	\$ 3,526.00
Net assets released from restrictions	\$ 30,179.00	\$ (30,179.00)	\$ –
Total unrestricted operating revenues and support	\$ 4,894,638.00	\$ (13,031.00)	\$ 4,881,607.00
Operating Expenses			
Program			
Clinical	\$ 770,889.00	\$ –	\$ 770,889.00
Research	\$ 1,566,216.00	\$ –	\$ 1,566,216.00
Total Program Expenses	\$ 2,337,105.00	\$ –	\$ 2,337,105.00
General and Administrative	\$ 1,280,856.00	\$ –	\$ 1,280,856.00
Fundraising	\$ 31,267.00	\$ –	\$ 31,267.00
Total operating expenses	\$ 3,649,228.00	\$ –	\$ 3,649,228.00
Change in net assets	\$ 1,245,410.00	\$ (13,031.00)	\$ 1,232,379.00
Net assets, beginning of the year	\$ 1,516,396.00	\$ 13,031.00	\$ 1,529,427.00
Net assets, end of the year	\$ 2,761,806.00	\$ –	\$ 2,761,806.00

