

2017 Benefit Corporation Report

Message from our CEO



Dear friends,

The millennium began with the completion of the Human Genome Project and the promise of a century of cures. While we have witnessed great strides of biomedical innovation in the first two decades of the 21st century, 95% of the 7,000+ rare diseases still have no FDA approved treatment, let alone a cure. At the current pace of new orphan drug approvals, it will take another 400+ years before every rare disease is solved. In addition to overcoming that innovation deficit, there's an equally enormous economic challenge. Extrapolating from the current pace of orphan drug pricing, soon only the richest will be able to afford all the promised cures.

Perlara PBC was founded in February 2014 as the **first biotech Benefit Corporation** to solve both of those seemingly intractable problems. Our specific public benefit is encoded in our corporate DNA aka our Articles of Incorporation: *Perlara will promote the development and promotion of the wide distribution of novel pharmaceutical treatments worldwide for human diseases which are currently underserved by existing pharmaceutical companies, including without limitation, the approximately 7,000 currently commonly identified "rare diseases" of genetic origin.*

Originally named Perlstein Lab PBC as a reflection of my academic roots, we announced our first round of seed funding in the summer of 2014 and started executing on our vision in the lean startup mode. We rebranded to Perlara after becoming a Y Combinator company in the Winter 2016 batch. In October 2016, we announced a lysosomal diseases research collaboration with Novartis, which also became an investor in Perlara. Between November 2016 and January 2017, we announced our first three PerlQuest partners: (1) Grace Science Foundation for NGLY1 Deficiency; (2) Wylder Nation Foundation for Acid Sphingomyelinase Deficiency; (3) Maggie's PMM2-CDG Cure LLC for Phosphomannomutase 2 Deficiency.

Looking ahead to 2018, I'd like to share our top 3 goals for the year. First, our overarching goal for the year is profitability. In 2017, we booked \$600,000 in revenues, proving that our novel business model of partnering early with patient advocacy groups works, and putting us on a path to become cash-flow positive. Second, we will double the number of PerlQuests from three to six. That translates to launching one or two new PerlQuests in each fiscal quarter. Third, we will work to advance our lead asset, PERL101, to a point of partnership.

Thank you for being a part of our journey as we reveal the unseen connections not only between rare diseases, but also between rare diseases and common diseases. It's a vision we call the Genetisphere. For more on that and other new developments at Perlara, keep reading [our blog \(The Ark\)](#) and following our [tweets \(@PerlaraPBC\)](#).

Sincerely,

Ethan Perlstein, PhD
Founder & CEO, Perlara

Perlara

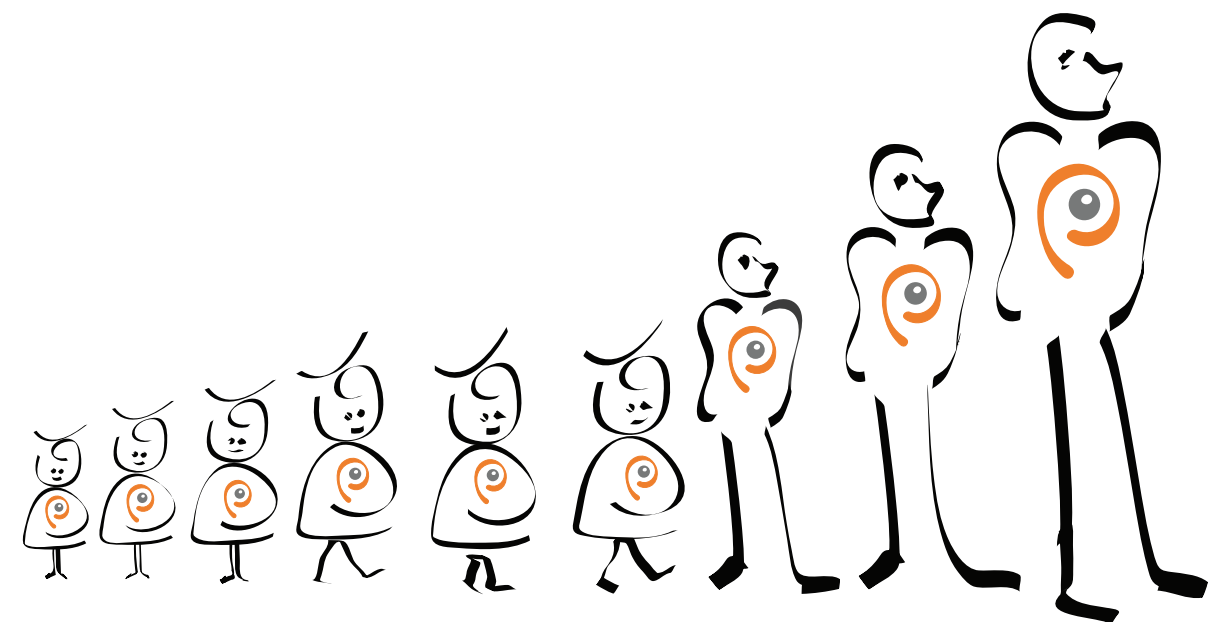
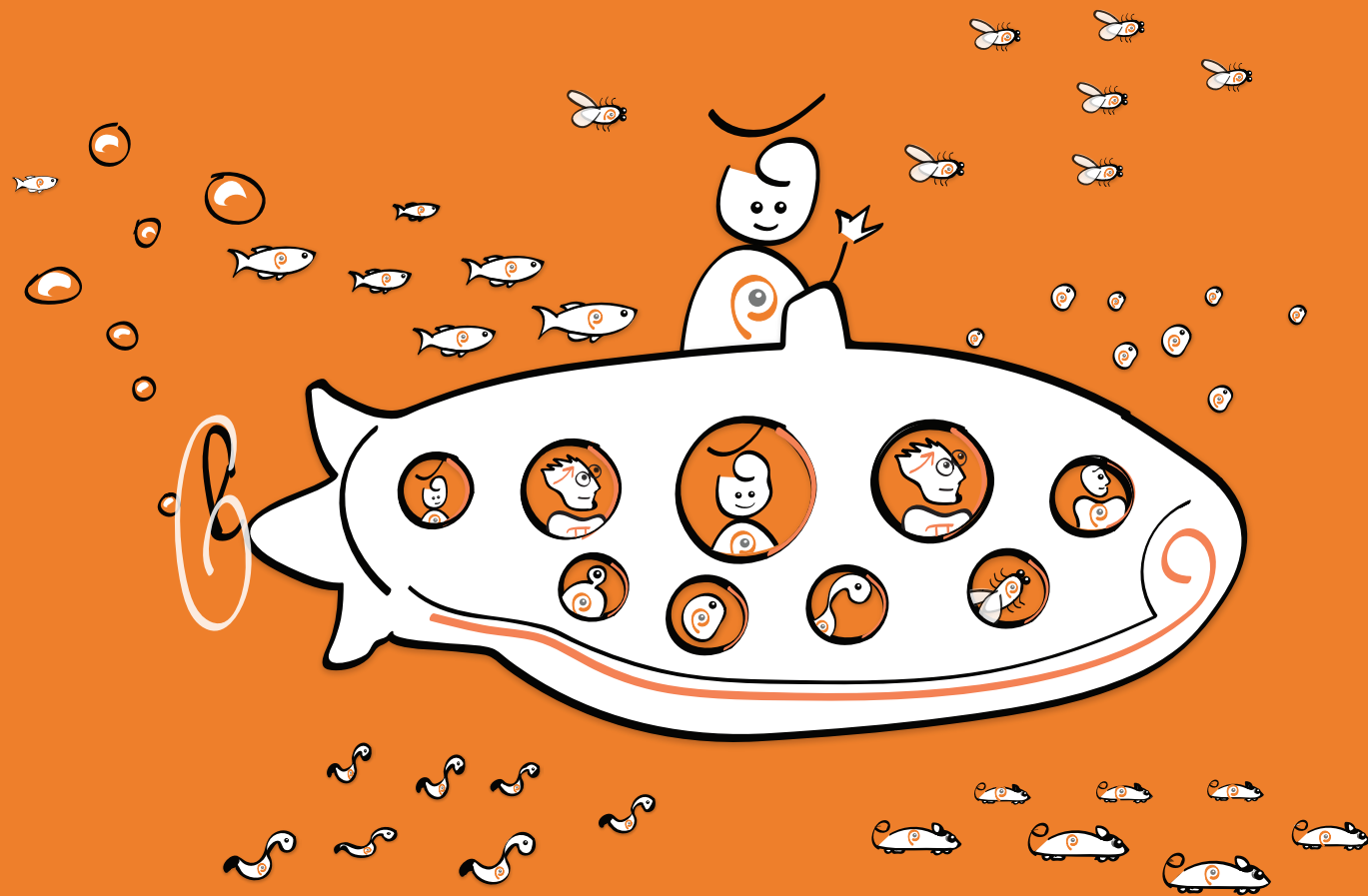
benefits from the long tail of drug discovery

Perlara, PBC was originally founded as Perlstein Lab, PBC in February 2014. In September 2016, the company created a new logo/mark that embodies the excitement and hope of scientific discovery. Our primary mission is open discovery for public benefit to improve quality of life for individuals, families and society at large.

Perlara PBC is the first personalized drug discovery platform partnering with highly motivated families and BioPharma to cure diseases thought too rare to matter. Our [Perlara Drug Discovery Platform](#) increases the speed and lowers the cost of cure discovery by rapidly screening thousands of potential drug candidates, providing new hope for millions of rare disease patients. [PerlQuests](#) are drug discovery collaborations funded directly by patient families and groups, who in exchange receive joint ownership of the resulting data and inventions.

We are a diverse team with expertise in genetics, pharmacology, cell biology, data science and automation. We share an enthusiasm for scientific discovery and a commitment to sustainability, transparency and engagement. As of January 2018, Perlara has 15 employees based in our South San Francisco, CA headquarters and partners from coast to coast, who all are on a mission to accelerate the discovery of cures for rare genetic diseases and uncover underlying mechanisms that enable the development of treatments that work across a range of diseases and individuals.

This report covers our first four years, 2014-2017, as the first biotech Public Benefit Corporation (bioPBC) and as individuals within the context of a balanced and healthy global economy and environment.



Benefit Corporation

Public Benefit Corporation

We chose to incorporate as the first biotech Public Benefit Corporation because we are accountable for our actions as a company and as individuals within the context of a balanced and healthy global economy and environment.

PBC report

Since our founding in 2014, our mission has guided our actions—from operating our lab in a sustainable way, to the science we pursue – finding treatments that improve quality of life for the smallest patient groups and can scale to the largest inter-disease populations.

Open Science

Transparency in our DNA

The greatest scientific advances have occurred in an environment of open sharing across disciplines and contrarian points of view. Our approach as a business and as scientists is inherited from that ethos.

Our heart is an open Blog

Our blog and tweets are our journal. There are no gatekeepers. Breakthroughs and bumbles in science and business are there for your consideration and feedback. We will learn and grow together to find the best outcomes for the patients and communities that we serve.

Patient Equity

Co-development

The PerlQuest model makes it possible for families and patient advocacy groups to be partners in their own journey of therapeutic discovery with the knowledge that, in the process, treatments for other people and diseases may be revealed.

Co-ownership

PerlQuest partners share in the upside of commercializing discoveries from a PerlQuest into a new clinical venture. Co-ownership reinforces the mission to find a cure and contributes to the sustainability of all partners.



Living cost of research

Mammals matter

The Perlara Platform uses simple animals like yeast, nematodes, fruit flies and zebrafish to identify potential therapies, which conserves the lives of larger animals like the mice, dogs and primates necessary for later research phases.

Tiny critters, more cures, lower cost

Our unique multiple small organism approach allows us to rapidly identify potential therapies for a single inherited disease at a lower cost. Each disease shares some characteristics with other diseases, allowing us to apply therapies to more diseases and improve quality of life for more people.

Pleasing the planet

Buy local

We often work with local sources for lab supplies and equipment to reduce our shipping footprint and support the local economy. Buying local is in keeping with our environmental mission to reduce the carbon footprint of drug discovery.

Buy diverse

The richness of our supply chain is in step with our scientific approach. Strength in diversity. We are aligned with businesses of many stripes that share a commitment to excellence and sustainability.

Waste less

We know that waste in our business practices can have an effect on the environment and our bottom line. We are on the lookout for nondegradable or extra lab and shipping materials that could end up choking our oceans.

Open business

Trust through transparency

PerlQuest partners, staff, investors, and vendors have a stake in Perlara's success and a right to know what is going on in the business. We make regular, frank blog posts about our financial status and challenges.

Our word is our bond

We are as meticulous in our business dealings as we are in our science. Straightforward and timely communication is foundational to Perlara. We honor our commitments.

Strength in diversity

Perlara's team reflects our world. Every age, sex, expertise and continent is represented. We share an enthusiasm for scientific discovery and a commitment to the families we serve.

Benefit Corporation *practicing sustainability*



"Since our founding in 2014, our mission has guided our actions—from operating our lab in a sustainable way, to the science we pursue—finding treatments that improve quality of life for the smallest patient groups and can scale to the largest interdisease populations."

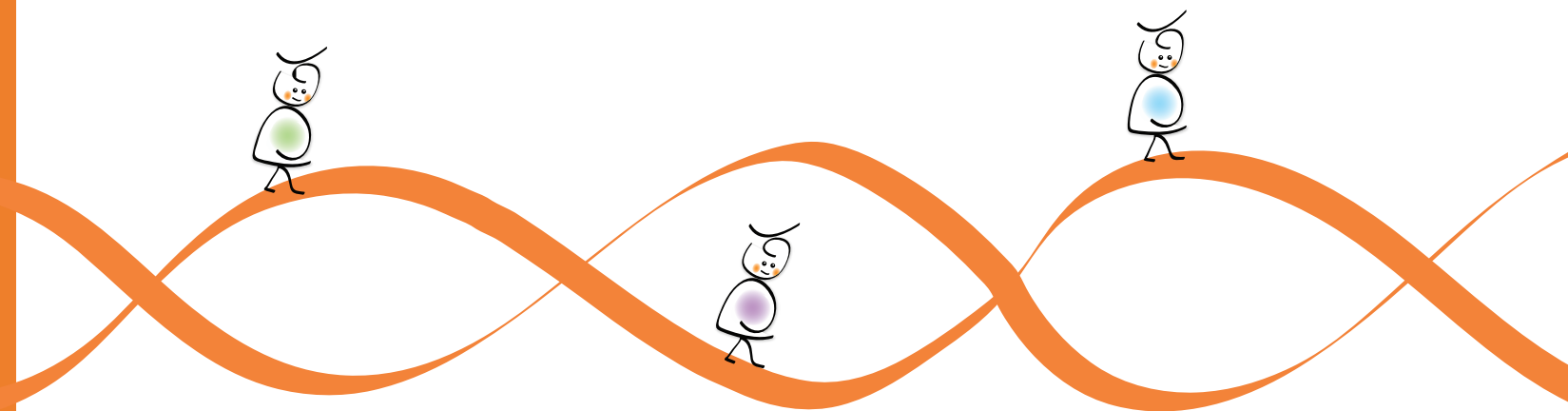
Incorporating as a Public Benefit Corporation ("PBC" or "Benefit Corp") is more than mere symbolism and signaling—it is an enduring and emphatic statement about accountability, transparency and human ecology.

By choosing to become a PBC from its inception, Perlara accepts responsibility to be not only cognizant of our social and physical environment, but also rigorous in challenging unsustainable business practices.

An offspring of the Corporate Social Responsibility (CSR) movement, the Benefit Corporation is a business organizational structure that, under varying state laws, demands that companies operate transparently, are accountable and strive to do more than just maximize profit.

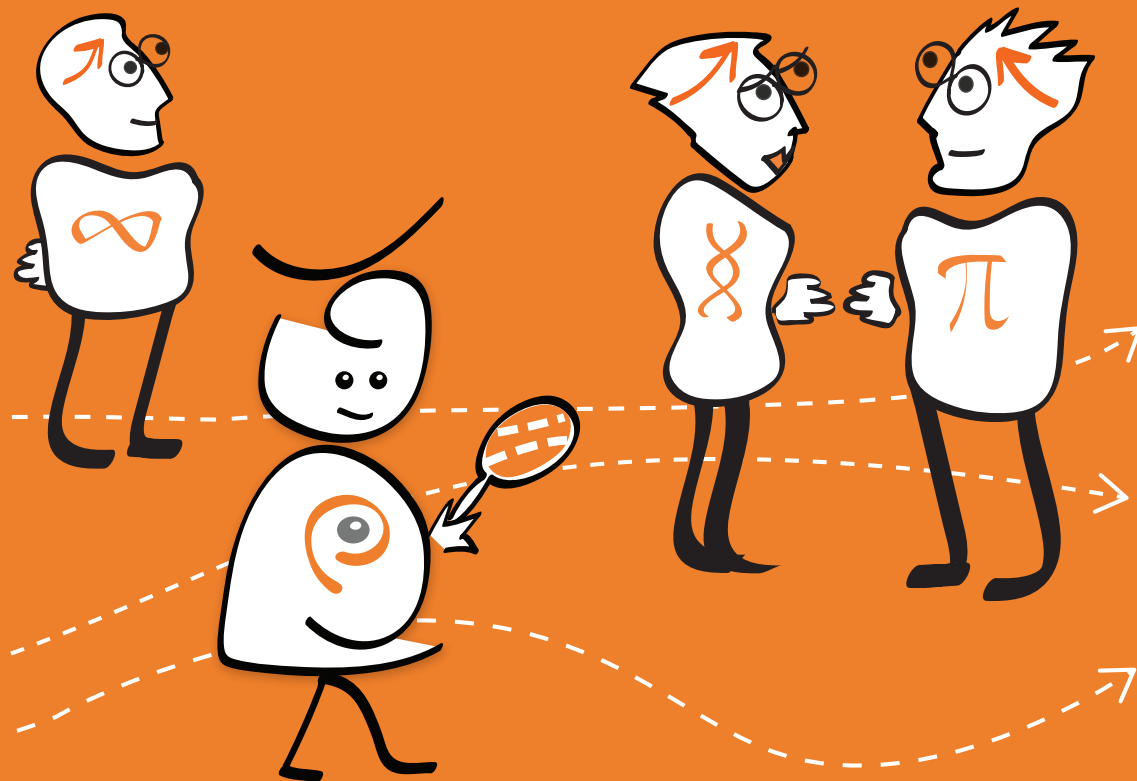
Benefit Corporations are statutorily required to codify and honor their beneficial purpose in their organizing documents. Perlara has detailed its mission to find cures for rare diseases into its Articles of Incorporations and has encoded a commitment to patient-centeredness, sustainability and transparency into its DNA. Our [benefit charter](#) outlines six specific benefit purposes which permeates all we do.

That commitment to public benefit has informed our decisions, and remains as firm today as it was from Day One.



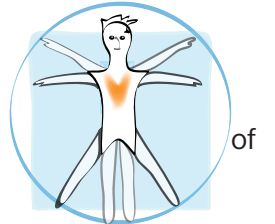
Open science

share more, share often... better science



Transparency in our DNA

Since its founding, Perlara has sought to accelerate and democratize access to research. In this endeavor, Perlara has published two preprints in bioRxiv and has one manuscript under review at an open access journal. In early November 2016, Perlara published its [first preprint](#) to bioRxiv, along with all the raw data on GitHub. Two weeks later, our CEO wrote a [blog post about the preprint](#) asking for “the really fun part Open Science: feedback”.



Perlara submitted its [second preprint](#) to bioRxiv at the end of December 2017, which is now a submitted manuscript under review at an open access journal. Our CEO blogged about the reprint, [writing a post](#) on the Grace Science Foundation blog explaining the research in plain English and a [second one](#) on The Ark comparing our research results to a recent paper on the same subject. The scientific community is accelerating our transparency efforts through online conversations on blogs, Twitter, Facebook and LinkedIn.

“Open science in action: @eperlste compares and contrasts findings in drosophila models...”

@Matt Might
Professor, Division of General Internal Medicine
Hugh Kaul Endowed Chair in Personalized Medicine
Director, Hugh Kaul Personalized Medicine Institute

Furthering our company essence of open discovery for public benefit, in January 2017 we published an [FAQ page](#) on topics ranging from our business to science to PerlQuests, collaborations with rare disease families and patient advocacy organizations.

While we are encouraged by the rest of the industry who is just starting to catch up, Perlara plans for an even greater amount of disclosure in the spirit of open science in 2018. May we all take two steps forward and one step back by sharing in real time and without paywalls, for the greater good of scientific learning.

Open science

4,640
tweets



2,933
followers

1,435
following



4,956
likes

20
articles
about Perlara



2
preprints



3
podcasts

The Ark



96
blogposts

share more, share often... better science

Our heart is an open blog

Perlara has endeavored to be different from the typical biotech startup with respect to online outreach and sharing, especially patient engagement. What initially drew our CEO into the orphan disease space was the openness, zeal and grace of patient advocates on Twitter and the blogosphere, so it's only fair that Perlara has returned the favor.

The default setting of biotech startups and pharma giants alike is stealth mode. At Perlara the default is set to open. As the first biotech PBC (public benefit corporation), transparency is encoded in our corporate DNA. That's why we're live-blogging the odyssey of a new chemical entity from hit discovery to preclinical data package to validating deal and beyond.

As a for-profit company, we have to be mindful of proprietary concerns. Wherever possible we strive to engage patients, advocates, scientists and the public at large on our science, and share the week-to-week victories and tribulations of a biotech startup. Our current team of 15 blog on The Ark, and tweet on Twitter about our collaborative journeys of discovery.

Our scientific developments clock in at 49% of posts—allowing patient families and advocacy organizations to follow PerlQuests, small organism disease modeling and drug screening; the science of rare diseases; and the business of orphan drugs.

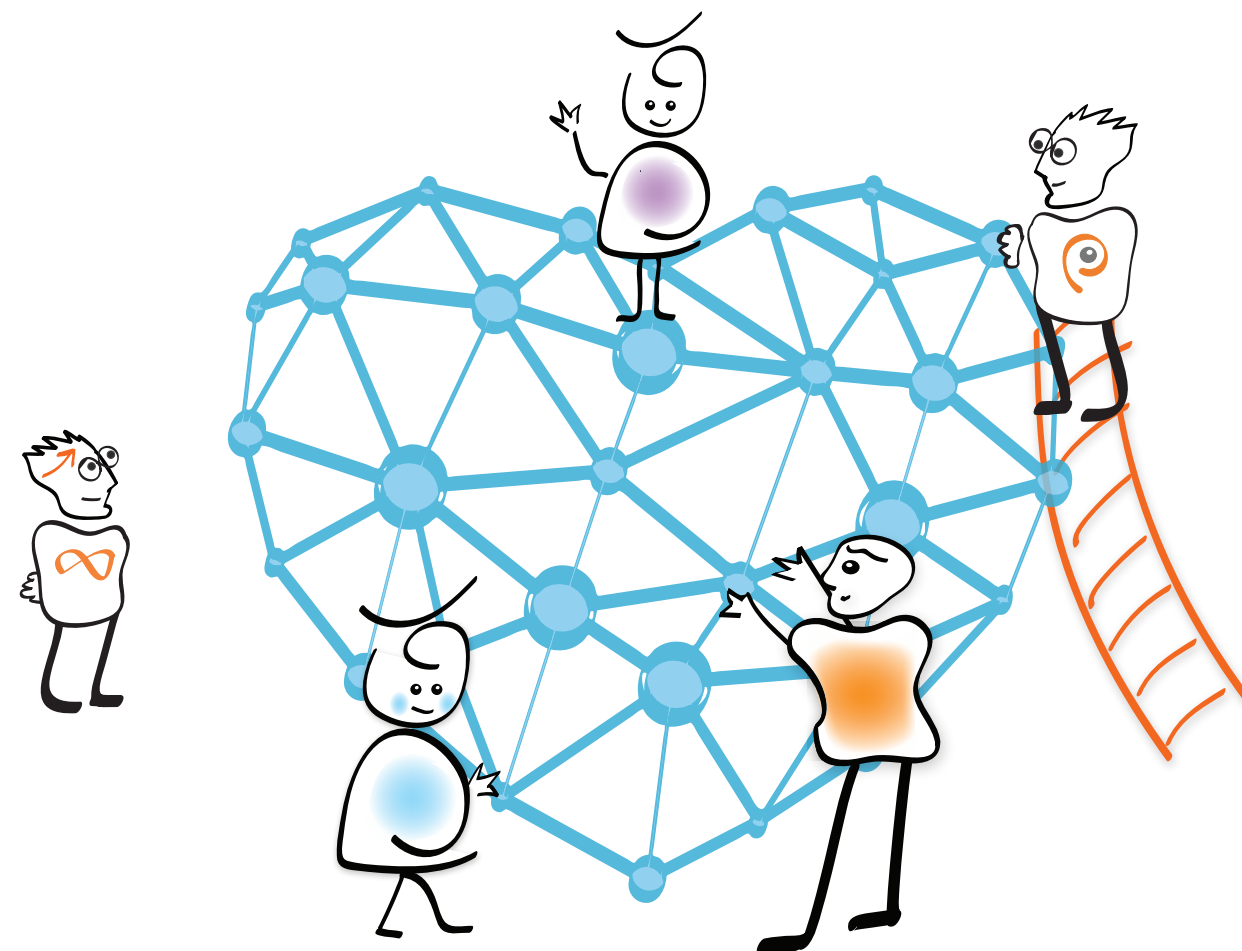
Our CEO ended 2014 with a "year in tweets" post. The following January 2015, he inaugurated the "last month in tweets" series as a fun and hopefully informative way to summarize our progress. A blog editor joined the Perlara team in December 2017 to spearhead the growth of The Ark into a mature open science publication.

Our blog and Twitter stats for 2014-2017 show our commitment to open sharing. 16 scientists and 5 business executives wrote 96 blog posts on 17 topics such as startup burn rate, fundraising, outfitting a research lab, patient advocacy and sustainability. [@PerlaraPBC](#) has 4,640 tweets, Following 1,435, Followers 2,933 and Likes 4,956.

Our blog is our journal. Twitter is our amplifier. We're not going to wait to publish. We'll go directly to consumers of research and the public to share data and data results that we're comfortable with and can stand behind. We call this responsible data.

Patient equity

everyone has skin in the game



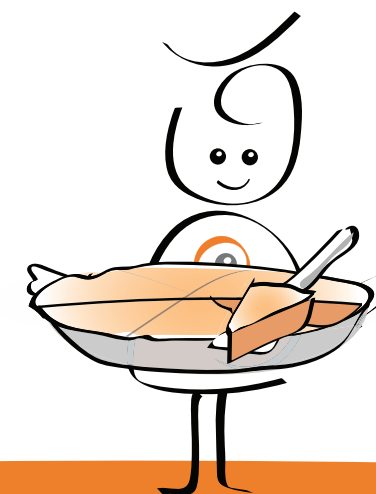
Co-development

[PerlQuests](#) are drug discovery collaborations funded directly by patients, families and patient groups, who in exchange receive joint ownership of the resulting data and inventions. The PerlQuest model democratizes venture philanthropy and makes it possible for any patient advocacy group to be equal partners in their own personalized drug discovery journey. Our first PerlQuesters are Grace Science Foundation (NGLY1) (Q1 2016), Wylder Nation Foundation (NPA) (Q4 2016), and Maggie's PMM2-CDG Cure (Q1 2017), three pioneers in the search for treatments of rare diseases.

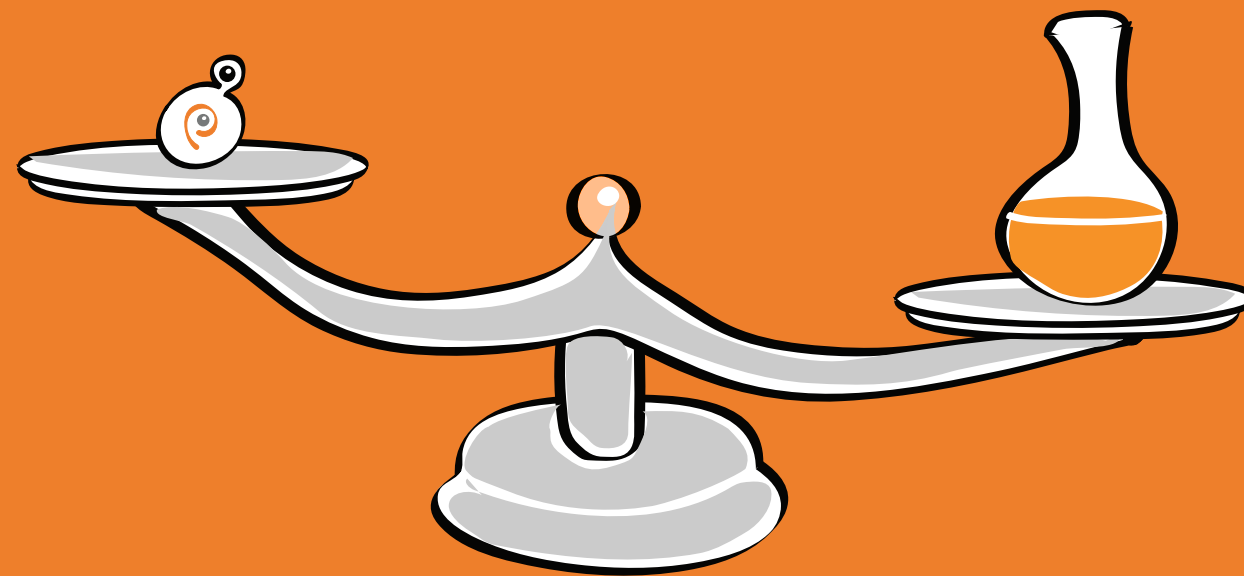
In January 2017, we unveiled PerlQuest pages on our web site to publicly share these trailblazing co-development journeys. The web site FAQ page provides general and legal information as well as fundraising tips for potential PerlQuest collaborators. Our scientists blog and tweet weekly about the progress of each PerlQuest for partners, supporters, rare disease families and patient advocacy organizations. We stand by the concept of PerlQuests, our collaborative model of bottom-up, patient-driven drug discovery partnership.

Co-ownership

Typically patient groups fund research projects through donations, grants and sponsorship—all non-equity financial arrangements. Perlara embraces a new patient-as-partner approach that values PerlQuest funding as investments, which lead to shared future returns for all investors. Perlara and three highly motivated partners have signed PerlQuest collaboration agreements to date. 2018 goals are to move toward commercialization agreements with current partners and to sign six new PerlQuests.

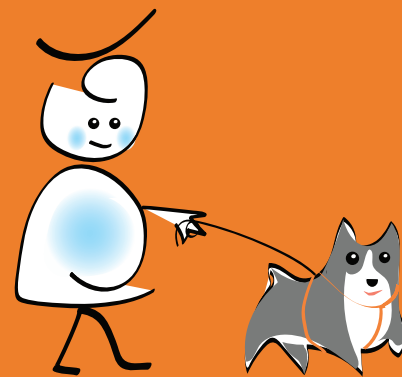


Living cost of research



"The greatness of a nation and its moral progress can be judged by the way its animals are treated."

Mahatma Gandhi



smallest sacrifices, largest rewards

Mammals matter

In [Animal Testing and Medicine](#) published by National Center for Biotechnology Information, Rachel Hajar, M. D. lobbies for the "3Rs campaign, which advocates the search (1) for the replacement of animals with non-living models; (2) reduction in the use of animals; and (3) refinement of animal use practices. By employing the 3Rs when continuing to use animals for scientific research, the scientific community can affirm its moral conscience as well as uphold its obligation to humanity to further the advancement of science for civilization and humanity."

Our CEO knew he was onto something when he attended Rare Disease Day 2013 at National Institutes of Health (NIH) and learned that very few (if any) orphan disease researchers leverage primordial disease models, even though ancestral forms of many rare disease genes are evolutionarily conserved in simpler organisms. Instead, the vast majority of this research relies on mouse and larger animal models of disease, and has done for the last 30+ years.

At Perlara, we generate model organisms (yeast, worms, flies, and zebrafish) that carry mutations in genes mutated in human disease—"patient avatars". Then, we screen for new chemical entities that can reverse defects in one or more organisms have the potential to be the basis of a curative therapy.

In 2017 Perlara publicly stated its principles of the ["Middle Ground"](#) out of a concern for animal welfare and a belief that the good arising out of experimentation does outweigh harm to the animal. The ethics are bred into the evolutionary Perlara Drug Discovery Platform. In 2018 Perlara will pursue accreditation by the Association for Assessment and Accreditation of Laboratory Animal Care, International (AAALAC) with the goal of joining 1,000 organizations in 46 countries who have earned [AAALAC accreditation](#).

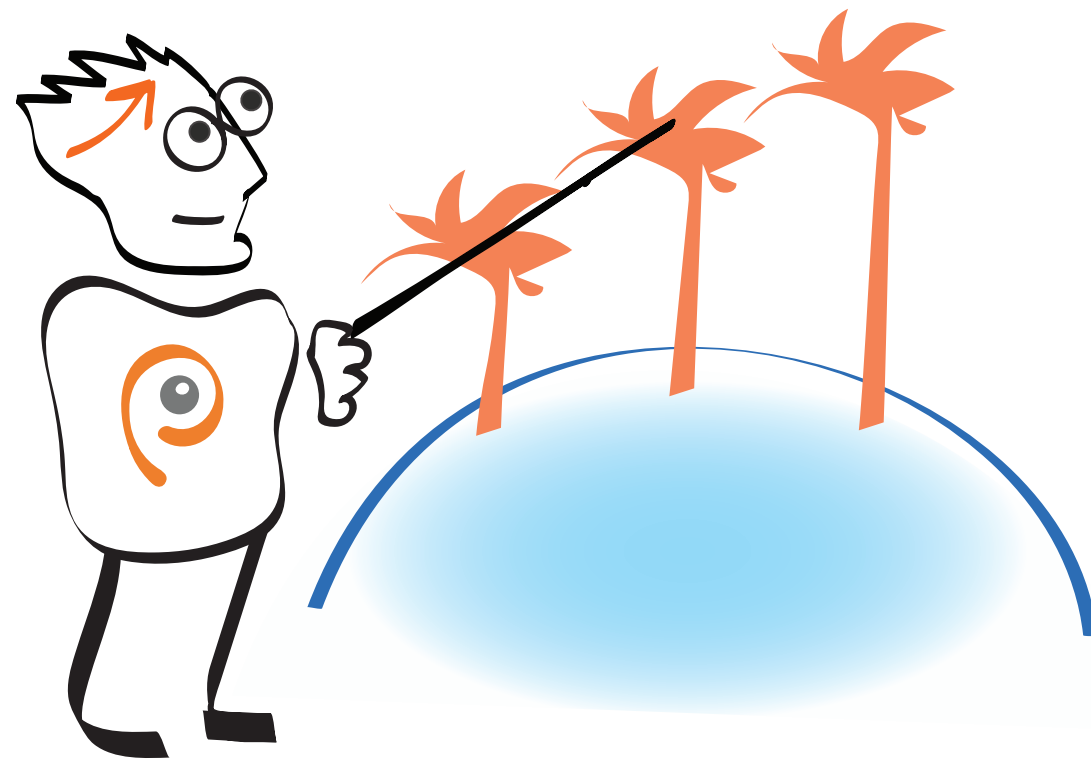
Tiny critters, more cures, lower cost



Perlara uses a [platform approach](#) for parallel screening across model organisms and across multiple diseases in a race to cures for the common from the rare. Mouse research is expensive. 9 out of 10 drugs fail in clinic after all these animals die. The motivation for the Perlara platform is to reduce the number of unqualified drug candidates introduced into the mouse phase, reducing the costs of drug discovery. Screening in model organisms is cheaper and allows for system-wide validation. For a single disease, the drug discovery process is reduced both in time and costs allowing us to achieve results at a third of the cost of traditional drug discovery. We've already seen this with the first disease in our pipeline, namely Niemann-Pick Disease Type C. With each additional disease, the cost of screening will go down so that with the knowledge gained, the process of drug discovery becomes more efficient as well as economic.

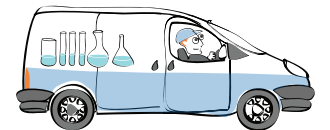
Pleasing the planet

our bottom line... people, planet, profits



Buy local

As a PBC, it is our duty to sustain values that grow our company with more than profits in mind. We constantly ask ourselves, "How can we become kinder, more efficient, and less wasteful?" To do this, we've begun measuring our carbon footprint associated with purchasing lab supplies, specifically, the shipping distance. In balancing the cost vs. benefits of measurement, we ran out of resources to constantly track these numbers. We will reassess measuring carbon footprint this coming year as our company implements a new information technology system. Overall, we made 9.2 % of our lab purchases from local or small businesses. As we grow in 2018, we will continue to find and work with manufacturers and suppliers who are "local" to support the local economy and natural beauty of the SF Bay Area.



Buy diverse

In some instances, our purchasing decisions are difficult. We choose to promote a societal benefit at an environmental cost. For example, we've started buying supplies from Dot Scientific because we support the diversity of women-owned suppliers at the cost of shipping from Michigan (2391 miles) instead of similar suppliers in California, like E&K Scientific (42 miles). Moving forward, we will work and partner with other biotechs, scientific suppliers, and organizations to help the process of scientific research become more gender balanced. Our partnership with [HappiLabs](#), our Virtual Lab Manager, furthers this initiative through their women-run companies purchasing program.



Waste less

The impacts of our day-to-day decisions may be small, but as we grow, Perlara wants to be a model for other companies to follow. We know that waste in our business practices can have an effect on the environment and our bottom line. We are on the lookout for nondegradable or extra lab and shipping materials that could end up choking our oceans. When the company ships out goods, it reuses packing materials. We buy biodegradable products whenever available. Operations has set up recycling stations for non-toxic glass, paper and plastic waste throughout the office. The kitchen is stocked with washable dining ware as an alternative to paper and plastic goods. These efforts and more to come will result in a cumulative and significant impact on society and the environment.



Open business

lessons learned and shared



"The currency of blogging is authenticity and trust."

Jason Calacanis
American Internet entrepreneur,
angel investor, author and blogger

Trust through transparency

As a Public Benefit Corporation, transparency is a common thread tying our mission and day-to-day activities together. From the outset, we decided to openly share Perlara business and scientific data to demystify the life of a biotech startup. Our About Us and PerlQuest pages list our vendors, partners and PerlQuest collaborators. Anyone with access to the Web can read The Ark and follow us on Twitter to learn about our burn rate, [spending](#), vendor selection and procurement criteria and process, [fundraising](#) ins and outs and other financial data and business practices. 43% of blog posts are about the business of being a startup. We strive to be forthright in sharing our journey to find cures for rare to common diseases, while paying it forward for the next generation of startups.

Our word is our bond

Responsible entrepreneurship is paramount to Perlara. We've invested in the virtual model for easier collaboration and sharing within our team and more efficient communication with our contractors and suppliers. We assess lab and office purchases based on functionality and product requirements, as well as the personality and honesty of the sales rep and field technicians. At the end of the day, it's not a product you're buying, but a supplier you're investing in. When selecting a vendor or partner, we follow the philosophy of "choose a winner, be kind to the loser". We hope our partners will provide the same consideration. We honor our agreements and pay on time. :)



Strength in diversity

Perlara prides itself on its ethnic, gender and age balance. The team ranges from recent college grads to seasoned professionals, all determined to make a difference in the lives of rare disease patients and their families. While the pharma and biotech industry continues to struggle to make progress with gender diversity, the Perlara team is 67% women. According to a Lifestream 2014 survey, women make up approximately 20 percent of biotech management teams and approximately 10.5 percent of biotech boards (Liftstream). Perlara is far ahead of this benchmark with an equal number of men and women in senior positions, 1 woman out of 3 BOD members, and 60% of women on its scientific advisory board.

Our staff hails from almost every continent and ethnic background with expertise in genetics, pharmacology, cell biology, data science and automation. Working with families, advocacy groups and BioPharma companies, we share an enthusiasm for scientific discovery and a commitment to transparency and engagement.



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