



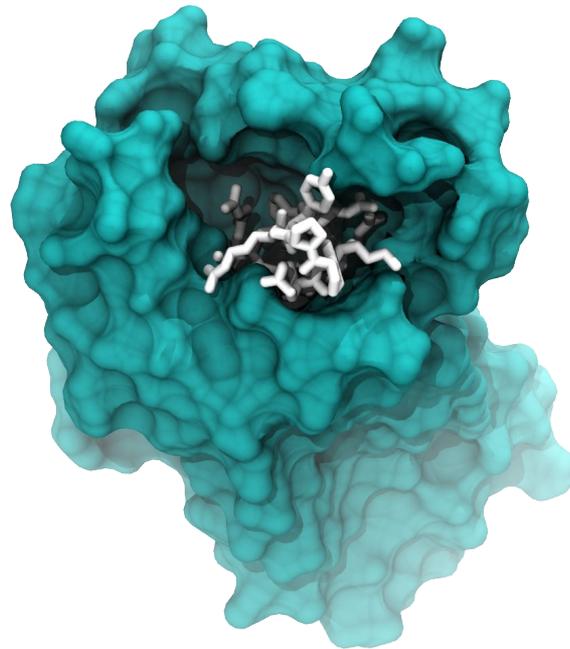
# ProteinQure

Introduction for prospective employees

# Summary

**We accelerate novel therapeutic development by building and sharing tools which improve the understanding of biology.**

- Toronto-based startup funded by Silicon Valley & Canadian VCs
  - [Raised seed round in July 2022](#)
- 20 employees as of July 2022
- 8 current commercial drug discovery projects (including a collaboration with AstraZeneca)
  - We don't sell software, we work in partnerships on real drug discovery. Our computer designed molecules go to the lab.



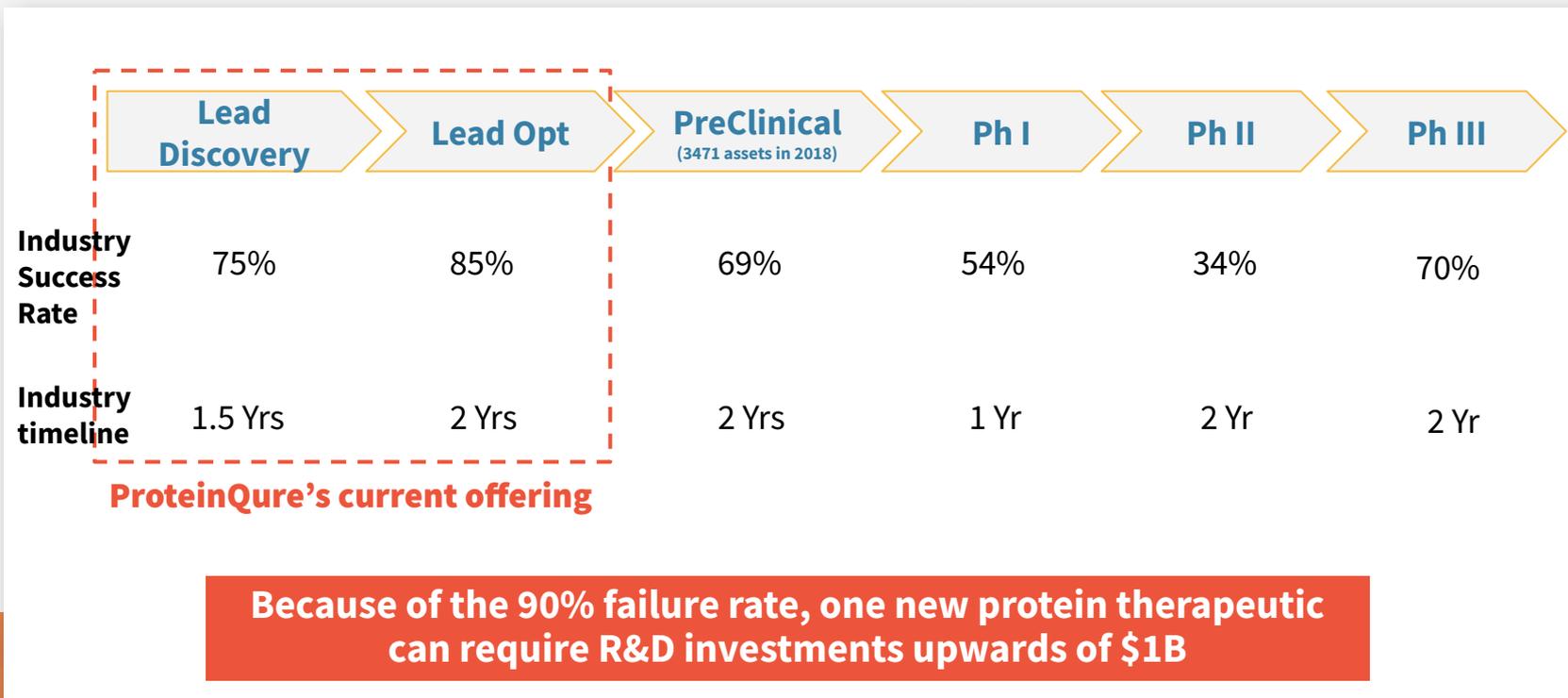
Felicis Ventures

8VC inovia

GLOBAL FOUNDERS CAPITAL

GOLDEN  
VENTURES

# Protein therapeutics are \$200B+ market growing at 12% but most of the 3,000 annual projects fail



# ProteinQure is a leader in computational protein design

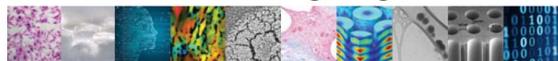
We are one of 12 healthcare companies in the Top 100 AI by CB Insights

2020 Healthcare



RECL, abro, ProteinQure, iz.ai, Eko, Healt, CLICA, OWKIN, PAIGE, Ato, CBINSIGHTS, tterfly, SUBTLE MEDICAL, Concerto

## AI for Biomaterials and Drug Design



### Symposium Co-Chairs



**Payel Das**  
IBM Thomas J Watson Research Center



**Sarah Tao**  
Technology Lead  
Sanofi

### Key Speakers



**Machine learning methods for the de-novo design of proteins and antibodies**  
**Philip M. Kim**  
Professor, Donnelly Centre for Cellular and Biomolecular Research, University of Toronto



**Debora S. Marks**  
Associate Professor  
Harvard Medical School



**Chemical Discovery and AI-Assisted Chemical Synthesis**  
**Connor Coley**  
Assistant Professor of Chemical Engineering, Massachusetts Institute of Technology



**Combining machine learning with other computational methods for drug design**  
**Glenn Butterfoss**  
Senior Computational Biologist.  
ProteinQure

Article | [Open Access](#) | Published: 23 September 2020

## Ensemble-based enzyme design can recapitulate the effects of laboratory directed evolution in silico

**Aron Broom**, Rojo V. Rakotoharisoa, Michael C. Thompson, Niayesh Zarifi, Erin Nguyen, Nurzhan Mukhametzhonov, Lin Liu, James S. Fraser & Roberto A. Chica [✉](#)

*Nature Communications* **11**, Article number: 4808 (2020) | [Cite this article](#)



**This is why we have multiple partnerships with large pharma**

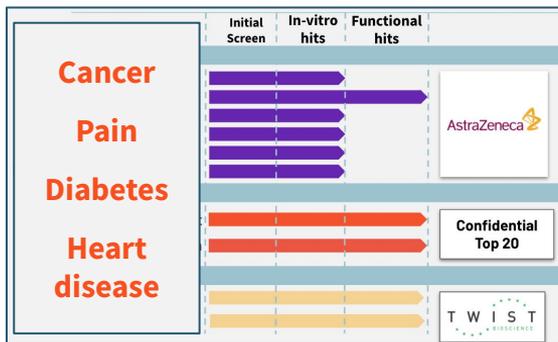
# Our advantage is working on intractable diseases; not speed or cost



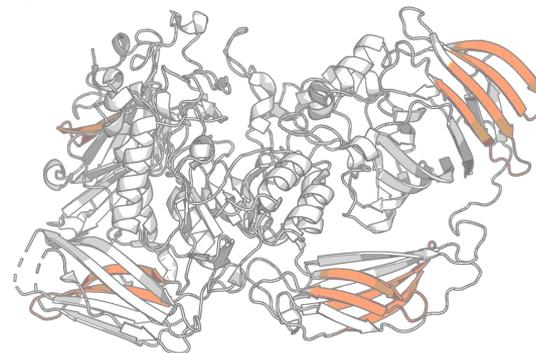
Confidential  
Top 20 pharma



## Validated platform



## Novel proteins + low data requirements

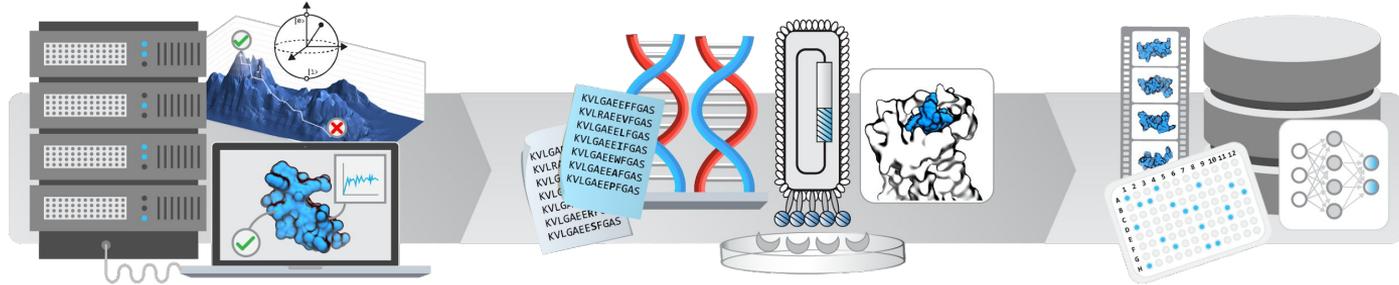


# Why join us?

**Team.** Our team is a diverse interdisciplinary and collaborative group. We have published in top journals, worked for the best enterprise companies in the world and have helped organized some of the largest open source software conferences.

**Challenge.** We are innovating in science, software engineering and business models. We work in one of the most competitive industries and with the most advanced technologies. If you love problem solving and learning this is the place for you. You will learn how to build cutting edge tech, work with senior groups from global companies and operate high performance scientific teams.

**Impact.** The next technological revolutions in biotechnology will potentially be some of the largest boons to human health that we have ever seen. We are not just trying to design life saving drugs, we are helping grow our understanding of biology along the way.



# We aspire to be the best protein design company in the world, these are the **core beliefs we build upon**

## Structure- and physics-based methods

Eventually, most objects in the world are going to be instantiations of computer code.

Autonomous vehicles will be code made physical (as transport), entertainment will be code made sensory. Biologics won't be different.

Proteins are small machines that obey the rules of physics. A protein's sequence and environment determine its structure. That 3D structure determines the function. Medicines will be polymers that are instantiations of code made physical (as biological 'machines'). Diversity is an essential key to effective computational tools: trading off accuracy and efficiency, as well as ensembling varying methods.

## Machine learning to represent proteins

Humans are powerful storytellers. It is our ability to label and build narrative that sets us apart. We use those labels to learn relationships and communicate with each other. But English is a poor way to answer what a protein is. Alpha helix, beta sheet, disordered are terms that we create to help bring order to a messy world. But proteins don't conform to neat labels.

An accurate description would be defined by 3D coordinates of atoms and distributions over time. Measurements which are beyond simple one-word descriptions. So, we build representations of these proteins that enable computational tools.

Graphs, PDBs, structural features and embeddings all need to be part of our tool kit.

## Wetlabs reimaged

Experiments are critical to deciphering biology and driving new insights.

The experiments of tomorrow will combine the strengths of human intuition with machine intelligence to uncover insights into complex biological systems.

Examples include multiplexed assays that a human mind could never deconvolute, designed tradeoffs in accuracy/throughput of experiments and measurements which are only interpretable by machines (such as wavelengths).

# Company values are what we prioritize

**Transparency.** We encourage open and honest communication between all levels of the company. This includes sharing information on projects, goals, business objectives and across cross-functional teams. Stick up for your own opinions and don't hold back just because you aren't the most senior person in the room.

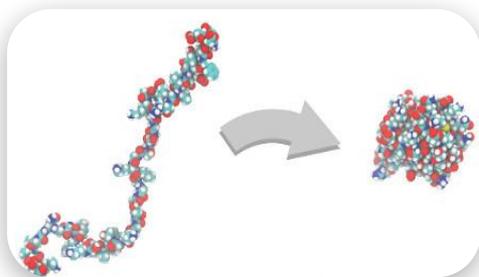
**Ambition.** At ProteinQure we are creating novel technology, you can't be afraid to fail. ProteinQure routinely sets goals that others would find crazy. Our commitment to each other and a job well done stands out both internally and to our partners. So we don't believe in setting low bars or settling for sub-optimal approaches. We focus on iteration and improvement as we work.

**Learning and growth mindset.** Results are meaningless without understanding. We aim to understand the how and why, not just get lucky with the answer. We reward good processes and persistence; not just results. We also embrace feedback. People are expected to ask for feedback and more importantly do the hard work of giving it! We also don't just stay in our lane. ProteinQure employees are marked by an intellectual curiosity for topics beyond just their domain.

**Diversity and Collaboration.** ProteinQure is at its strongest when we combine our diverse technical skills, intellectual passions and experiences. Collaboration across diversity of all forms is foundational to how we operate and embedded in our hiring. We have a workplace where our differences enhance our work.

<sup>1</sup>This is not an exhaustive list of our values, but what distinguishes ProteinQure is the *emphasis* we place on the above.

# ProteinQure builds on breakthroughs in computational tools



## Biophysical Simulations and Integrative Modeling

- Enhanced-sampling for protein structure/dynamics
- Protein-protein docking
- Protein design



## Machine Learning with Protein Sequence/Structure data

- Enhanced definitions of structural diversity
- Rapid property prediction and integration of multiple tools

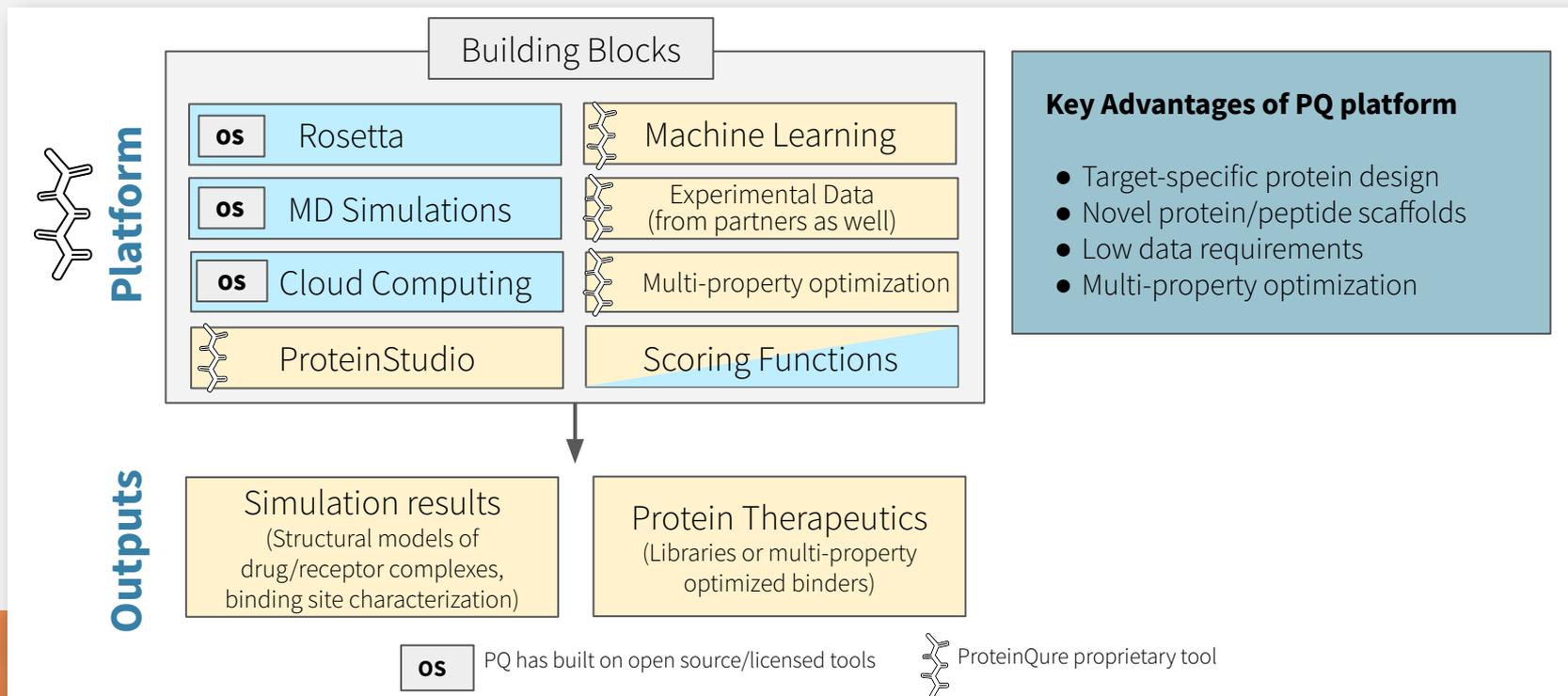
## Hardware Partners



## Next-Generation Computing Platform

- Cloud computation at scale including proprietary orchestration tools

# ProteinQure's unique **protein design platform**



# How we work

Some of the current (Q2 2022) processes:

- Weekly lunch and learns (sometimes external) involving all groups
- Agile for all teams (biology and tech) using Gitlab
- Quarterly OKRs (type of goal setting) for both teams and the company
- Collaborative (scientists, engineers, business) efforts on projects



PQ HQ at 119 Spadina



Wetlab and office at MaRS Discovery District

# Toronto is great!

**World-class location** for talent, resources, and fun!

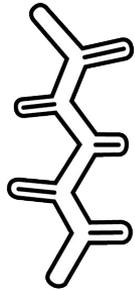
Thriving healthcare, software, and deep tech ecosystem; a competitive advantage for companies like ours who are some of the first to establish themselves in Toronto

Canada is an extremely diverse and welcoming culture

## Facts:

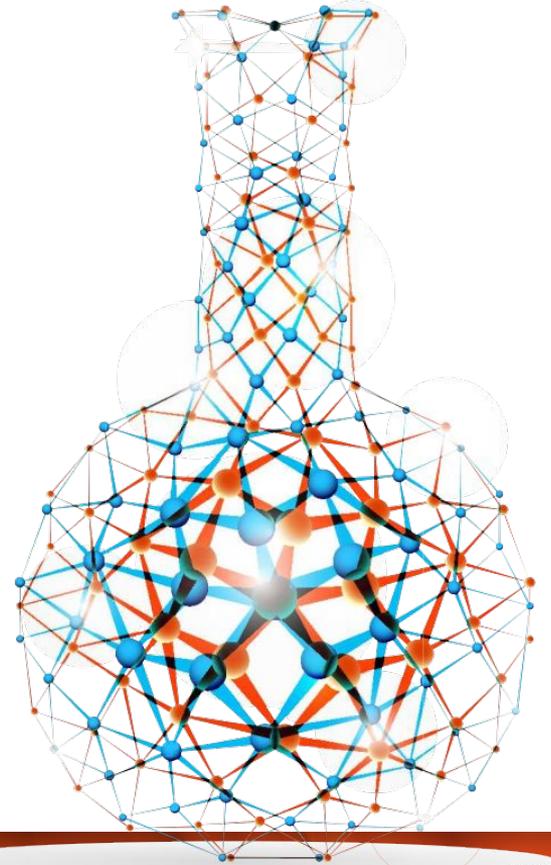
- Created the most tech jobs of any North American city in 2018
- 4th largest city in North America
- Top 10 most liveable city in the world!
- Professional Soccer, Hockey, Baseball, Basketball, Ultimate Frisbee teams
- Thriving cultural scene (International Film Festival, Food, Theatre, Museums)





# ProteinQure

## Designing a healthier tomorrow



# Advisors that have done it before

## Scientific Advisory Board

### VP Chemistry, Morphic

Morphic therapeutics (Raised 240M+) uses computational tools to do structure based design and Blaise was employee #2



Blaise Lipka

### CEO, Atomwise

Atomwise is an AI platform for computational drug discovery of small molecules and has raised \$50M+



Abraham Heifets

Marcel Patek



### Previous:

### Director Chemistry Sanofi VP Chemistry Icagen

25+ years experience designing peptide drugs across multiple disease classes, including global chemistry and peptide teams at Sanofi



Ron Lennox

### Serial Biotech Entrepreneur

Founded 7 companies (6 successful exits) and served on the board of 18 biotech companies.

# Hiring Process (This may differ for certain roles)

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While the process isn't always the same for every role we try to keep it relatively consistent.

1. **Introductory Call (~30 min).** We want to get to know you, understand your motivations and make sure you have the requisite skills for the position. This is also a chance for you to ask us questions!
2. **Technical Assignment or Interview (~2-3 hours).** Either a technical interview or a take-home problem solving assignment which is representative of an open-ended problem in early-stage drug discovery or software/ML that would involve the use of computational methods.
3. **On-Site Interview (~3 hours).** You will meet with multiple people on the team. Our primary focus is for you to meet the broader team and understand if there is a mutual fit. On the technical side this may include a work assignment, seminar, or homework as well. We cover travel and accommodation costs if necessary.

# Benefits & Perks

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- **Work flexibility.** We are pretty good at accommodating your preferred working styles. We rely on you to decide what is necessary to get the work done. That includes taking as much vacation as you want.
- **Conferences and learning perks.** We support all of our employees efforts to learn and improve. Most employees participate in at least one conference of their choice per year.
- **Health benefits.** Health spending accounts and benefits that are in the top 20% of all Toronto startups.
- **Free food.** Bagels every Monday, free Wednesday lunches and dinner credits for everyone who stays past 7PM or works on weekends.