

We use synthetic biology and nanofluidics for next-gen protein engineering



adaptyvbio.com Wilmington DE

Technology

LEAD INVESTOR



Timothee Peter

Adaptive Biosystems is working in an industry that will need large amounts of data to design effective protein based medication. The technology currently being developed at Adaptyv Biosystems enables to gather this data in an effective and scalable way. Not only will this information be extremely valuable for screening those proteins, but it will allow the development of more complex medications in the future. Adaptyv's team showed motivation and drive from the beginning of the project and I'm excited to see how their project will evolve in the future.

Invested \$1,000 this round

Highlights

- 1 In the future, all proteins will be made using cell-free synthetic biology
- 2 We are building the best platform to engineer proteins based on high-throughput nanofluidics
- 3 This way we generate the data needed for training ML models that can predict new protein designs
- 4 Our platform develops better therapies against targets in cancer, autoimmune & rare diseases

Our Team



Julian Englert Co-founder and CEO

Up till now, organisms were the workhorses of biotech and all proteins were made in cells. This decade, the industry will go cell-free and go beyond the proteins that are found in nature. With Adaptyv, we're enabling this next-gen protein engineering to create better therapeutics.



Moustafa Houmani Co-Founder and CTO



Amir Shahein Co-Founder and CSO

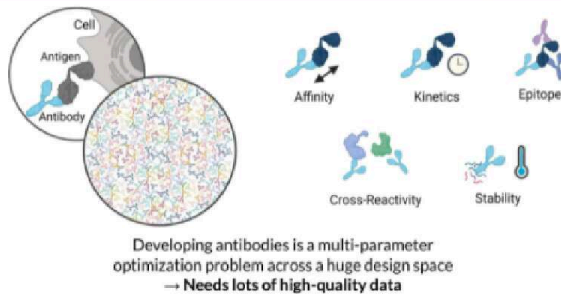


Daniel Nakhaee Zadeh Gutierrez Co-Founder and COO

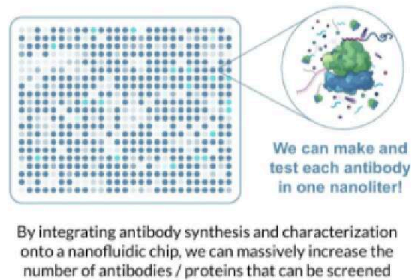
Slide deck



Antibody therapeutics are great but really hard to develop



Cell-free + nanofluidics = high-throughput screening



After only 6 months of working on antibodies

4 Pilots (on-going)



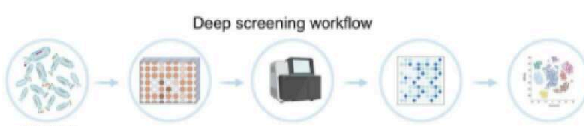
4 LOIs / projects scheduled



Forward-looking projections cannot be guaranteed.

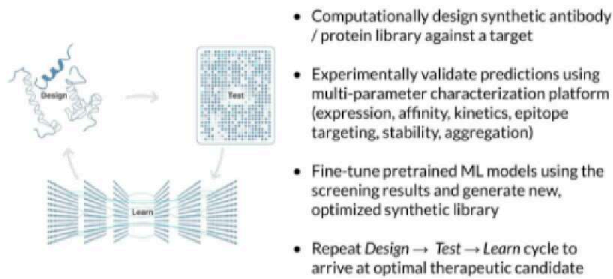
Go to market: Fee-for-service model to generate data

- We interface with standard antibody discovery pipelines (phage display)
- We provide our partners with 100x more data about their phage display pools (deep screening on our platform)
- We can use all of that data to train our ML models to understand antibody binding → then we'll use those models to design new antibodies in silico



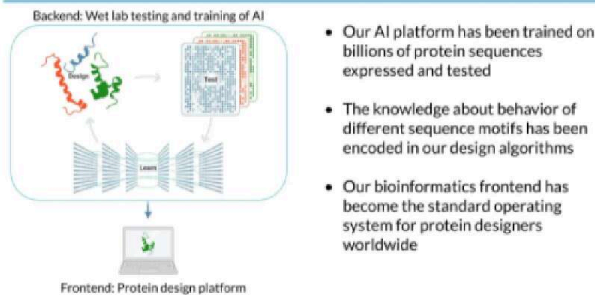
Forward-looking projections cannot be guaranteed.

In two years: Integrated in silico protein design workflow







Forward-looking projections cannot be guaranteed.

In 5 years: operating system for protein engineering



Forward-looking projections cannot be guaranteed.

Founding team

			
Julian Englert	Daniel Nakhaee-Zadeh	Moustafa Houmani	Amir Shahein
MSc Materials Science	MSc Bioengineering (EPFL, Harvard)	MSc Bioengineering (EPFL, ETHZ)	PhD in Nanofluidics
Quit previous job to found startup	Turned down multiple PhD offers for Adaptyv	Quit his PhD to be full time on Adaptyv	Finishing up his PhD so we have at least one founder w/ PhD

Advisors

		
Prof. Sebastian Maerkl EPFL (Switzerland)	Prof. Victor Greiff University of Oslo (Norway)	Reto Hartmann Innosuisse
Expert in synthetic biology and nanofluidics	Expert in machine learning and computational antibody engineering	20+ years of Life Sciences business development (US, EU)

Based in Lausanne, Switzerland



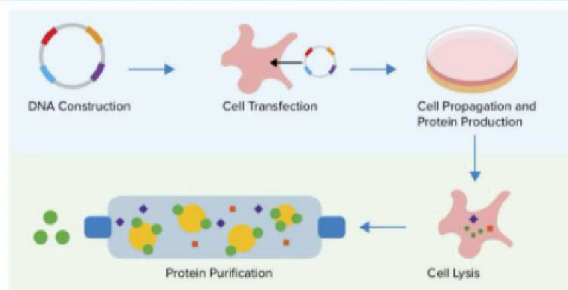


Moving to Biopôle Life Science Campus next month

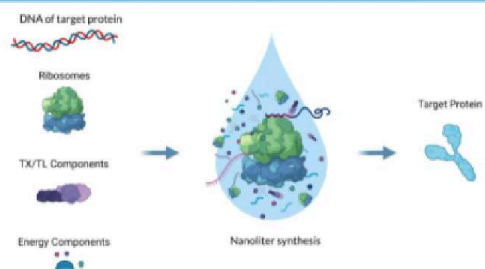


Cell-free annex

Last century, organisms were the workhorses of biotech



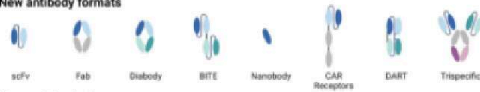
This decade, we will use **cell-free** systems





Cell-free synthesis enables unlimited new applications

New antibody formats



New protein designs

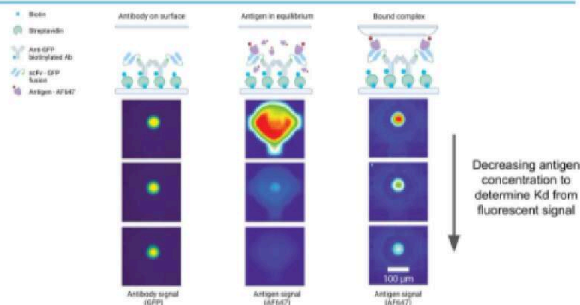


New chemistries

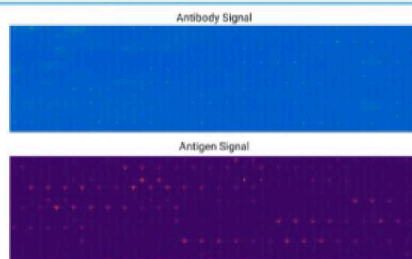


Technical annex

Image acquisition and analysis



Fluorescence scan of full nanofluidic chip



The intensity of the signal in each well represents the raw expression level of the antibody (top image) and the raw binding affinity to the antigen target (bottom image)

Pilot: Synthetic nanobodies against SARS-CoV-2



Goal of project: Generate high-affinity synthetic nanobodies against SARS-CoV-2. Perform epitope binning to define variants that target a set of non-overlapping epitopes to design broadly neutralizing fusion nanobody.

Done:

- (Partner: Display panning of sybody library against SARS-CoV-2 spike protein)
- Sybody expression test for first validation
- Affinity characterization of 100 selected variants from enriched pool

On-going:

- Full screen of up to 5000 variants from enriched pool
- Epitope binning of top 50 sybodies (1200 unique competition assays)

