



CASE STUDY

From Proof-of-Principle to Investor-Ready in One Month

Goddard Product Development's industrial design team transformed a rough microfluidics prototype into a production-ready system that drew strong partner and investor interest at a major trade show.

Overview

Client

RAN Biotechnologies, a microfluidics company

Industry

Life sciences instrumentation

Services

Industrial design, mechanical engineering, design for manufacturing and assembly

Timeline

One month

Outcome

A user-focused, near-production system presented to investors and partners at a major trade show



The Challenge

RAN Biotechnologies came to Goddard Product Development with a working proof-of-principle prototype for a microfluidics station. The prototype proved the concept: it integrated the hardware needed to run the processes while housing the consumables and the microfluidics chipset. But it was rough. Collection, consumables, and waste management were disorganized, routine maintenance took unnecessary steps, and operators had to trace multiple tubing paths to understand how the system worked.

RAN Biotechnologies needed to turn that functional-but-rough prototype into a system they could put in front of investors and customers, one that looked and worked like a premium lab instrument and showed clear readiness for manufacturing. The catch was the timeline: they wanted it in one month, without sacrificing the usability and polish that would make it credible. Having partnered with Goddard before, they returned for high-quality support at a reasonable investment.

The Solution: Goddard's Approach

Goddard's industrial design team and RAN Biotechnologies' engineers worked together to define the use case, theory of operation, and design inputs. By observing how operators would actually interact with the system, the team mapped friction points in the user journey and set a shared objective: a clear, ergonomic, and efficient instrument that reduced cognitive load and simplified setup and teardown. Defining these issues early gave structure to the rest of the work and aligned both teams before design began.

Fast, low-cost iteration in 2D before committing to 3D

The team explored a broad range of directions in 2D, from safe updates close to the original prototype to bolder alternatives that reimaged the system's structure. Working in 2D first kept iteration fast and cost-effective, letting the team test many ideas before committing to CAD. Once RAN Biotechnologies selected a preferred concept, the team moved into 3D modeling, refining form, fit, and scale while testing ergonomics and component access. Quick 3D prints validated dimensions and part relationships before any investment in high-fidelity prototypes. Discovery sessions, digital design reviews, and weekly check-ins kept priorities aligned throughout.

Engineering built into design, not bolted on after

The industrial design team worked alongside Goddard mechanical engineers from the start, using a design for manufacturing and assembly (DfMA) approach. Drawing on their own mechanical engineering expertise, the ID team led key decisions while ensuring every choice was validated by mechanical engineering review. Addressing technical trade-offs during design, rather than discovering them afterward, eliminated rework and was central to hitting the aggressive one-month schedule within budget.

User-centered refinement

The redesign organized internal components into a logical structure so operators no longer had to trace tubing to understand flow. Access to replaceable parts was simplified, and visual hierarchy guided attention to the most important interactions. The team refined the housing around clear ergonomic priorities: minimizing cognitive load, establishing a clear hierarchy of processes through physical layout, and easing setup, changeover, and teardown. The refined geometry also improved airflow management, supporting more consistent reagent performance.



The Results

Prototypes were tested in RAN Biotechnologies' own lab, where operators confirmed a clear improvement in usability and visual quality, noting smoother workflows, easier component replacement, and less confusion during operation. The redesign delivered:

- Faster setup and teardown and simpler maintenance, improving operator efficiency in daily batch processing.
- Lower training time for new operators and reduced operator error during batch runs.
- Investor-ready presence. Presented at a major trade show, the system drew strong interest from potential partners and investors and gave RAN Biotechnologies a platform for funding discussions.

- A foundation for a product line. The design established a repeatable framework and consistent brand identity for future products in the same family.

In one month, Goddard helped RAN Biotechnologies advance from proof-of-principle to a credible market contender: a functional, ergonomic, and visually cohesive system that projects the confidence and credibility of a production-ready product, ready to carry the RAN Biotechnologies brand forward through investor presentations and the transition to manufacturing.





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