

The Home Diagnostics War: Why Khosla's Bet on Siphox Will Outlast A16Z's Function Health

NOV 25, 2025



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Abstract

This essay examines two competing approaches to consumer health diagnostics: Khosla Ventures' investment in Siphox, a hardware-first at-home testing platform, and Andreessen Horowitz's backing of Function Health, a concierge lab testing service. While Function has captured significant market attention through aggressive marketing and celebrity partnerships, Siphox's vertically integrated hardware model offers superior unit economics, defensible intellectual property, and a path to sustainable competitive advantage. The analysis explores why proprietary diagnostic devices create more durable moats than service-based lab aggregation models, particularly in light of reimbursement pressures, regulatory dynamics, and the commoditization of basic biomarker panels. For health tech angel investors, this comparison illustrates fundamental principles about when to favor capital-intensive hardware plays over seemingly capital-efficient service businesses, and why tech moats matter more than growth velocity in diagnostic markets.

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The Scene at HLTH: When Booth Traffic Actually Means Something

Walking through HLTH this year, you could feel which companies had genuine product-market fit versus which ones just had marketing budgets. The usual suspects had their massive booths with the open bars and the swag that nobody actually wanted. But then you'd see these pockets of genuine crowding, the kind where people are actually waiting in actual lines because they want to interact with the product, not just get a tote bag. Siphox had one of those lines. Not the longest at the entire conference, definitely the longest sustained line of people genuinely interested in the technology rather than the free stuff.

I've been to enough of these conferences to know that booth traffic usually means nothing. Most of the time it's inversely correlated with actual business value. The companies spending six figures on booth space are often the ones desperate for relevance, not the ones building sustainable businesses. But every once in a while you see something different. You see engineers and clinicians and actual decision-makers.

waiting to get hands-on time with a device. That's what Siphox had. People want to see how the hardware worked, how the finger prick mechanism compared to traditional venipuncture, how the microfluidics actually processed the sample. It wasn't tire-kickers, this was genuine technical interest.

Meanwhile, Function Health had their presence too, though it was more about the brand than the product. Makes sense given their model doesn't really have a "product" you can demo. You can't exactly set up a phlebotomy station in the middle of a conference and have people get their blood drawn as a demo. So they leaned into what they do best, which is marketing and community building. And look, credit where it's due, they've done an incredible job building brand awareness and creating FOMO around comprehensive biomarker testing. But as I watched both companies operate in that environment, the difference in what they were actually selling became crystal clear.

Two Models, Two Philosophies, Completely Different Endgames

Let's get specific about what these companies actually do because the surface-level descriptions hide the fundamental differences. Function Health is essentially a concierge lab service. You pay them, currently around \$500 per year, and they give you access to a comprehensive panel of 100-plus biomarkers tested twice annually. They've partnered with Quest for the actual lab work. You go to a Quest patient service center, get your blood drawn the traditional way, and then Function gives you a dashboard to view your results with some interpretive content. It's a B2C play that sits on top of existing lab infrastructure, adding a user experience layer and care coordination.

Siphox takes a completely different approach. They've built proprietary hardware that enables at-home blood collection and analysis. The device uses microfluidic technology to analyze a finger-prick sample and can measure a growing menu of biomarkers. The key difference is vertical integration. Siphox owns the collection device, the analysis platform, and the entire customer experience from sample to

result. They're not renting someone else's lab network, they're building their own diagnostic infrastructure that happens to live in people's homes.

These aren't just different execution strategies, they're fundamentally different theories about where value accrues in the diagnostic value chain. Function is betting that aggregating existing lab capacity and adding a great consumer interface is enough to build a durable business. Siphox is betting that owning the hardware and the analysis technology creates a moat that service-layer companies can never replicate. And if you've spent any time in healthcare businesses that depend on third-party infrastructure, you know which model tends to win over a ten or twenty year horizon.

The Function Model: Beautiful Marketing Meets Brutal Unit Economics

Function has done something genuinely impressive on the go-to-market side. The made lab testing feel premium and aspirational instead of clinical and anxiety-inducing. The website is gorgeous, the member testimonials feel authentic, and they've successfully created a sense that comprehensive biomarker monitoring is something high-performing people do to optimize their health. Getting Dr. Mark Hyman and other wellness influencers involved gave them credibility in the long and biohacking communities. The waitlist strategy created scarcity and demand. From a pure marketing execution perspective, they've been nearly flawless.

But let's talk about what happens underneath that beautiful brand. Every Function customer represents a transaction where Function is the middleman between the customer and Quest Diagnostics. Quest has the market power in that relationship. Function. Quest knows exactly what those tests cost them to run, they know what margin they need, and they know Function needs them more than they need Function. Sure, Function has probably negotiated decent rates given their volume, but those rates are still subject to Quest's pricing power and operational realities.

The unit economics get even more interesting when you think about customer acquisition cost. Function is spending heavily on marketing to attract customers who are paying \$500 annually. Even if their gross margin on that \$500 is respectable :

paying Quest and their own operational costs, they need to keep that customer for multiple years to achieve reasonable payback on acquisition spend. And here's the thing about healthy people getting routine lab work: the engagement curve is not great. Year one, you're excited to see all your numbers. Year two, assuming nothing has changed dramatically, the novelty has worn off some. Year three, unless you're genuinely optimizing around these numbers, you start questioning whether you need this.

The customer lifetime value story depends entirely on retention, and retention in the wellness products space is historically terrible. Function might beat industry averages because they've built strong community and content, but they're still fighting against the fundamental dynamic that most people don't naturally engage with their health data when they're feeling fine. The business needs to acquire customers constantly to grow, which means the marketing spend never really goes down as a percentage of revenue. That's a treadmill.

The other challenge is that Function's value proposition is entirely dependent on price arbitrage and consumer ignorance about what lab tests should cost. Right now, most people don't realize they could get many of these same tests ordered through their primary care doctor, potentially covered by insurance, or at least at negotiated rates. As price transparency in healthcare improves (however slowly), and as more competitors enter offering similar panels, Function's pricing power erodes. They're trying to build a brand strong enough to sustain premium pricing, but they're selling a commoditized service. The tests themselves are standard CLIA lab assays. The interpretation isn't dramatically different from what you'd get from a decent doctor from any number of other wellness platforms. The special sauce is supposed to be the comprehensive panel and the experience, but those are hard to defend over time.

Why Siphox's Hardware Bet Changes Everything

When you own the hardware, you own the relationship with the customer in a completely different way. Siphox isn't just providing a service, they're placing a claim

in your home that becomes part of your routine. The device itself has value beyond any single test. It's an asset that enables ongoing monitoring in a way that going to a lab can never replicate. And from a business model perspective, this creates multiple revenue opportunities that a service-only model can't touch.

First, there's the device revenue itself. Selling hardware generates upfront cash, unlike a pure subscription service where you're financing customer acquisition entirely out of future subscription revenue. Second, once someone owns a Siphox device, the marginal cost of getting them to run additional tests is dramatically lower than convincing someone to schedule another lab appointment. The friction of that drops to near zero, which changes what kinds of monitoring become practical. Third, Siphox can expand their test menu over time through software and consumable updates, creating multiple expansion revenue opportunities from the same hardware install base.

The microfluidics technology they've developed is genuinely differentiated. Getting accurate biomarker readings from finger-prick samples is not trivial. There are massive challenges around sample volume, hemolysis, ensuring specimen quality, and achieving analytical accuracy comparable to venous draws. Theranos famously failed at this exact problem, among many others. The fact that Siphox has working technology that produces clinically actionable results from small sample volume is a real technical achievement. That's not marketing spin, that's legitimate innovation.

From an investor perspective, the question is always whether the technology advantage is sustainable and whether the unit economics work. On the technology side, Siphox has patents around their microfluidic platform and sample processing methods. These aren't easy to design around. Microfluidics is genuinely hard, and there's no open-source playbook for building accurate home diagnostic devices. Any competitor trying to replicate this has to solve the same physics and chemistry problems from scratch. That's a real moat.

On unit economics, hardware businesses are obviously more capital intensive up front. Manufacturing costs money, inventory ties up capital, and hardware has warranty and support costs that pure software businesses avoid. But in diagnostics specifically

these costs can be offset by the fact that you're capturing more of the value chain. Instead of paying Quest \$X per test and hoping to make margin on top, Siphox's margin is determined by their manufacturing cost and consumable costs, which they control. As they scale manufacturing, those costs drop. As they expand their test menu, they can charge more per device or per consumable without their cost structure changing proportionally.

The IP Moat That Actually Matters

Let's talk about intellectual property because this is where a lot of investors get confused about what actually matters. Function Health has a great brand and they probably have some trade secrets around their care coordination processes and their member engagement strategies. But none of that is defensible intellectual property. Brand value is real but it's not a technical moat. Another well-funded competitor could build an equally good brand with enough marketing spend.

Siphox has actual patents on their microfluidic platform, their sample collection methods, and their analysis algorithms. These are utility patents covering specific technical implementations that are necessary to achieve accurate results from small volume samples. Anyone trying to compete in the same space has to either license these patents, design around them (which may not be technically feasible), or infringe them. That's a completely different competitive dynamic.

The other IP advantage that gets overlooked is the data they're generating. Every run through a Siphox device generates data about how samples behave in their platform, how biomarkers correlate in finger-prick versus venous samples, how results vary by collection technique. This data becomes training data for improving their algorithms and expanding their test menu. It's a flywheel where more devices deployed leads to better performance which leads to more customers which lead to more data. Service companies don't have this flywheel because they don't own the testing platform.

Now, patents aren't everything. Patent thickets can be designed around, patent litigation is expensive, and in medical devices you have to actually execute on ge-

FDA clearance and building a reliable manufacturing process. But the combination of patents, proprietary data, and hardware/software integration creates overlapping barriers to entry that are much harder to overcome than just competing on brand and customer experience.

The regulatory piece is also worth understanding. Siphox's device is expecting FDA clearance for specific uses in 2026 and is currently selling a CLIA LDT mail in to get through. Getting through FDA clearance for diagnostic devices is not a rubber stamp process. You need clinical validation data showing your device performs comparably to lab-based gold standards. You need to demonstrate manufacturing quality controls. You need post-market surveillance plans. This takes years and significant capital. Once you've been through it, that's another barrier protecting you from fast followers. Function doesn't need FDA clearance because they're using existing FDA-cleared labs. That's an advantage in time-to-market but a disadvantage in defensibility.

Reimbursement Reality and the Service Model Trap

Here's where things get really interesting from a long-term business model perspective. Right now, both companies are primarily selling direct to consumer. Function is explicitly a cash-pay service. Siphox is also starting with DTC. But the money in diagnostics has always been in reimbursement from insurers, employers, and government payers. The question is which model has a path to capturing that reimbursement revenue.

Function's challenge is that insurers already have relationships with Quest and LabCorp. If an insurer wanted to offer comprehensive biomarker monitoring to members, they would just contract directly with one of the national labs and build their own member portal, or partner with someone who already has claims integration. There's no reason for an insurer to add Function as a middleman. Function might argue they provide value through engagement and member experience, but payers don't pay for engagement, they pay for medical necessity.

outcomes. Without clinical evidence that Function's approach improves health outcomes, there's no reimbursement case.

Employers are a more promising channel for Function because they do value engagement and they're willing to pay for wellness benefits that employees appreciate. Function could become a nice employee perk, especially for tech companies and professional services firms where employees expect premium benefits. But this is a sales process where Function is competing against every other wellness vendor for a slice of the benefits budget, and employers are increasingly skeptical of wellness programs that don't demonstrate ROI.

Siphox has a completely different reimbursement story they can tell. If their device enables monitoring that was previously impractical because of the friction of lab visits, they can potentially demonstrate value to payers in specific use cases. Think about chronic disease management where frequent monitoring actually changes behavior. Diabetics testing HbA1c more frequently. Patients on anticoagulation monitoring levels at home. People with kidney disease tracking creatinine. These are scenarios where home monitoring with clinical-grade accuracy could reduce hospital admissions and ER visits.

The key is that Siphox owns the device and the test, so they can pursue reimbursement codes the way traditional diagnostic companies do. They can run clinical studies showing their device enables better care at lower cost. They can get specific CPT codes approved. They can contract with payers the same way any other diagnostic company does. Function can't do this because they're not providing a test, they're providing access to standard tests.

The other reimbursement angle is international. US healthcare is uniquely dysfunctional around payment and insurance, but many other countries have more rational single-payer or social insurance systems where high-value diagnostics get adopted systemically if they demonstrate clinical utility. A device like Siphox's that enables home-based monitoring could get adopted by national health systems as a way to reduce healthcare system costs. That's a massive market that service models c

really access because you can't export a US-based concierge service to a country with completely different healthcare infrastructure.

What Khosla Saw That Others Missed

Khosla Ventures has a specific investing philosophy that shows up repeatedly in its healthcare portfolio. They bet on hard tech where there's genuine technical risk where success creates lasting competitive advantage. They funded Impossible Foods when everyone thought plant-based meat was niche. They backed Desktop Metal when additive manufacturing was still unproven. They invested in Bright Machines for factory automation. The pattern is they're willing to back capital-intensive businesses with long development timelines if the end state has strong defensibility.

In healthcare specifically, Khosla has invested in companies building proprietary technology platforms rather than companies building on top of existing infrastructure. Ginkgo Bioworks in synthetic biology. Freenome in cancer detection. Resilience in bioprocess development. These are all companies building foundational technology that could become platform businesses serving multiple end markets.

Siphox fits this pattern perfectly. It's hard tech, there's real technical risk in getting microfluidics to work reliably at consumer price points, the development timeline is measured in years not months, and capital requirements are higher than a pure software business. But if it works, the competitive position is genuinely defensible for a decade-plus. That's the Khosla bet.

Compare this to the A16Z investment in Function Health. A16Z also makes great investments and they've been successful with healthcare bets like Devoted Health and Lyra Health. But their model tends to favor fast-scaling businesses where they can use their platform and network effects to accelerate growth. Function fits that playbook. It's a business that can scale quickly with marketing spend, where network effects potentially help (more members means better data and community), and where A16Z's consumer expertise and brand building resources add real value.

Neither approach is wrong, they're just optimizing for different outcomes. A16Z probably expecting Function to either get acquired by a major consumer health or to scale to significant revenue quickly enough that unit economics work even mediocre retention. Khosla is probably expecting Siphox to build a platform business that becomes a lasting franchise, where the endgame might be continuing to scale independently or eventually getting acquired by a medical device giant that wants its own home diagnostics.

From an angel investor perspective, the Khosla model is harder to replicate because it requires deep technical due diligence and comfort with long time horizons. Most angels don't have the expertise to evaluate microfluidics technology and most don't have the capital to support companies through multi-year hardware development. It's worth understanding this playbook because when it works, the returns can be exceptional and the companies tend to be much more durable than fast-growth software businesses.

The Long Game in Diagnostics

If you project out ten years, the question is which company has the potential to build a fundamental infrastructure layer in healthcare versus which one is a nice consumer brand that gets consolidated or marginalized. My bet is Siphox has a path to become infrastructure and Function does not.

Imagine a world where reliable home diagnostic devices are ubiquitous. Where you have a device in your bathroom that can measure dozens of biomarkers whenever you want, send the data to your doctor, integrate with your health apps, and enable continuous monitoring that fundamentally changes how medicine is practiced. That world requires someone to build the hardware platform that makes it possible. Siphox is trying to be that company. If they succeed, they're not just a diagnostics company, they're a platform that other health services get built on top of.

Function, even in the best case, is a consumer health brand that provides access to existing lab infrastructure. That's valuable and can be a good business, but it's not infrastructure. It's a service layer that works until either the underlying infrastructure

changes, or until the arbitrage opportunity it's exploiting goes away, or until competition drives margins down. We've seen this movie before in healthcare. O Health tried to be the consumer-friendly health insurance brand on top of existing provider networks. Outcome Health tried to aggregate physician practice screen inventory. Crossix tried to aggregate pharmacy data. These businesses can work while but they tend to get squeezed over time because they don't own the core as

The diagnostic market is also consolidating around a few big players. Quest and LabCorp dominate traditional lab testing. Exact Sciences is building a franchise cancer screening. Guardant Health in liquid biopsy. Tempus in genomic profiling. Grail in multi-cancer early detection. These companies all have something in common: they own proprietary technology, they have IP moats, and they're building long-term franchises in specific diagnostic categories. Function doesn't fit this pattern. Siphox potentially does.

The capital requirements to get there are significant. Siphox will need to continue investing in R&D to expand their test menu, in manufacturing to scale production, in clinical validation to support reimbursement, and in sales and marketing to build awareness. That's probably several hundred million dollars before they reach escape velocity. But hardware businesses, once they work, can achieve really attractive unit economics at scale because manufacturing costs drop and customer acquisition costs relative to lifetime value improve as the brand builds.

The other long-term advantage is that hardware businesses are naturally more global. Siphox can manufacture devices and sell them anywhere in the world. They're not tied to US lab networks or US regulatory frameworks in the same way. Function would have to rebuild their entire operational model and partner network to expand internationally. For investors thinking about TAM, this matters. The market for diagnostic devices is global, the market for concierge lab services is mostly US-centric.

There's also a scenario where the home diagnostics market bifurcates. Maybe there's room for both a premium device-based approach and a service-based approach serving different customer segments. The device approach might win with people who want

frequent monitoring and are willing to pay upfront for hardware. The service approach might work for people who just want periodic comprehensive panels and don't want to deal with owning a device. But even in this scenario, I'd rather own a company with the proprietary hardware platform because they can always add a service layer on top, but the service company can't easily go backward and build hardware.

Looking at that HLTH booth traffic again with all this context, what I saw wasn't people interested in a cool new gadget. It was clinicians and health system executives and payers trying to understand if this technology actually works because if it does, it changes their planning around how diagnostics get delivered. That's the kind of interest that turns into enterprise deals and partnerships and eventually reimbursement. Siphox generates consumer interest and consumer revenue. Siphox is generating the kind of interest that leads to infrastructure adoption.

For angels considering where to deploy capital in the diagnostics space, the lesson is to look hard at companies building proprietary technology platforms even if they're capital intensive and have longer time horizons. The service-layer businesses are easier to understand and can generate revenue faster, but they're also easier to replicate and harder to defend. The hardware businesses are harder and riskier, but when they work they create lasting value that compounds over time.

Khosla's team saw this dynamic and made their bet accordingly. They're probably right. Ten years from now, Siphox has a chance to be a category-defining company that has changed how diagnostics work. Function might still be around as a nice consumer health brand, or they might have gotten rolled up into a larger consumer health conglomerate, or they might have faded as competition emerged and unit economics deteriorated. The boring truth about building lasting businesses in healthcare is at some point you need to own something proprietary that's hard to replicate. Siphox is trying to build that. Function isn't. And that difference matters more than any amount of marketing genius or community building can overcome.

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Art Babson Nov 26

I appreciate the commentary and distinction between Function and Siphox here. A few things - seems like the current Siphox platform relies on shoulder collection, not finger blood collection. Both are capillary blood in nature but do you see Siphox pivoting from shoulder collection to support at-home testing? If so, why?

Also, an at-home diagnostic analyzer is slick; however, you noted the erosion of engagement with healthcare when you are feeling fine. What prevents an at-home diagnostic analyzer from the same fate as any home appliance (like an insta-pot or creami) where initial engagement is high but ultimately frequent use decays and

durables come off the counter and put on a shelf high up in the closet? You can put a pressure cooker out of the closet after sitting idle for 2 years and still make a meal. I can't say the same for a diagnostic analyzer that is meant to send actionable results to your doctor to make informed medical decisions.

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