GESTATION, WITHOUT THE SURROGATE.

Nilufer engineers host animals that carry a pregnancy for people who cannot: a legal, predictable alternative to the human surrogacy market.

CROSS-SPECIES GESTATION PLATFORM

01 · THE PROBLEM

She has the eggs. Not the womb.

Millions of people can produce a viable embryo but cannot carry a pregnancy. Their only route to a genetic child today is another woman's body.

1 / 4,500	women are born without a functional uterus (MRKH), ovaries intact and eggs viable
1 / 6	adults worldwide experience infertility in their lifetime (WHO)
+470%	growth in US gestational-carrier cycles over 15 years
20–25k	people cross international borders each year for reproductive services

WHO IS LOCKED OUT

- born without a uterus (MRKH)
- hysterectomy: cancer, fibroids, obstetric bleeding
- eggs or embryos frozen before chemotherapy
- pregnancy itself too dangerous to attempt
- gay couples and single fathers by choice

The embryos are already in storage. What is missing is nine months of gestation, sold back to these customers today as a $150–250k surrogacy journey.

Sources: MedlinePlus, MRKH ~1 in 4,500 female newborns · WHO (2023), 1 in 6 adults · PMC6262674, US registry and cross-border ART · Mordor Intelligence (2026), journey cost

02 · THE SOLUTION

Swap the surrogate for a host animal.

An engineered host animal carries the intended parents' own IVF embryo to term. Every edit lives in the host animal's germline. The embryo is never edited.

	HUMAN SURROGACY TODAY	NILUFER
COST	$150–250k per journey, open-ended extras	host animals are bred, not contracted: fixed, predictable cost
LEGALITY	banned across most of Europe, Canada, Australia	operates under animal-husbandry and IVF frameworks, with no surrogacy contract
ETHICS	another woman carries the medical risk and the labour	no human gestational labour is involved
SUPPLY	one carrier, one pregnancy, years of matching	heritable edits make breedable host lines, so capacity scales as a herd

Same embryo. Same genetic parents. A different womb.

03 · TECHNOLOGY

Three systems make one host.

01

IMMUNE REPROGRAMMING

The host's uterine NK cells and macrophages have to read a primate placenta as self. Earlier cross-species attempts suppressed NK cells outright, which also removes the signals that drive decidualization, so the placenta never establishes. We re-educate that compartment rather than switch it off.

GERMLINE EDITING

02

GESTATION EXTENSION

An endocrine protocol stretches the host's gestation window from roughly 68 days toward the marmoset's 144. Guinea pigs end pregnancy by functional progesterone withdrawal, the same mechanism humans use, rather than the hormone crash seen in other rodents.

ENDOCRINE PROTOCOL

03

COMPLEMENT AND COAGULATION

Caviomorph complement is unusually potent and the clotting interface between the two species does not match, which puts the placenta at risk of attack and thrombosis. Both are corrected on the host side of the interface.

HOST-SIDE BIOLOGY

All modules consolidate into two heritable units in the host germline, so a single engineered breed carries the entire stack and reproduces it at livestock cost.

04 · SURROGATE ANIMAL

One placental lineage, 1 kg to 62 kg.

The usual objection to a rodent host is scale: large animals are epitheliochorial, so a stack built for a hemochorial placenta would not transfer. The capybara defeats that. Caviomorph, like the guinea pig, and human-scale.

	GUINEA PIG	MARMOSET	CAPYBARA	HUMAN
Role in the program	proof-of-concept host	proof-of-concept fetus	scale host	target
Body mass	~1 kg	~0.35 kg	~50 kg	~62 kg
Gestation	~68 days	~144 days	~150 days	~280 days
Neonate or litter mass	~0.1 kg	~0.03 kg	6–9 kg litter	~3.3 kg
Placental type	hemomonochorial	hemochorial	hemomonochorial	hemomonochorial

Hystricognath placentation follows an “extraordinarily stable pattern” across a fifty-fold range of body size, so these species “can be used interchangeably as models of human placenta” (Kanashiro et al., 2009). Guinea pig to capybara is a scale-up of the same biology, not a new species problem.

Hard policy at every stage: only the host animal is edited. The embryo and its donors are never edited.

Source: Kanashiro, Santos, Miglino, Mess and Carter (2009), Growth and development of the placenta in the capybara, Reproductive Biology and Endocrinology 7:57 (PMC2702307).

05 · TECHNICAL RISK

Open questions resolve on the bench.

We are past biological plausibility and into engineering risk. Each remaining unknown has a defined assay attached to it, and none of them require a pregnancy to answer.

ESTABLISHED

- Cross-species pregnancy carried to live birth (mouse in rat, in-house)
- 94 loci compared across both genomes: immune, decidual, complement, coagulation
- A first-pass edit set defined and ranked, mapped onto solved receptor and ligand structures rather than homology guesses
- The PD-1 checkpoint is natively compatible between the two species, so one arm of tolerance needs no edit at all
- Glycan xenoantigens are concordant, so the hyperacute rejection that blocks pig-to-human transplant does not apply here

OPEN, AND THE ASSAY THAT SETTLES IT

- **NK recognition: activation load, uNK density, artery remodelling**
  → co-culture killing assay plus uNK quantification against native pregnancy
- **Complement lysis at the interface**
  → host-serum lysis assay, with and without regulator
- **Coagulation mismatch**
  → protein-C activation assay
- **Litter mismatch: a capybara litter against a human singleton**
  → single-embryo transfer and uterine capacity studies in the scale host
- **Gestation mismatch: ~150 days against ~280 in human**
  → the endocrine extension protocol, re-derived at capybara scale
- **No off-the-shelf host germline platform**
  → CRO feasibility gate before any full build

Sequenced cheapest-failure-first. The edit set is expected to iterate as bench data comes back; that loop is the work.

06 · WHY NOW

The gap widens every year.

More embryos enter storage each year while the number of jurisdictions where a human may legally carry them falls. At the same time the tools to build a host became available.

EDITING PRECISION

Prime editing and site-specific integrases install multi-residue humanizations as single-copy, low-mosaicism germline edits. The same work under older nuclease editing meant indels and mosaic founders.

REFERENCE GENOMES

The current guinea-pig assembly and marmoset annotation are recent. The 94-locus comparison behind this program could not have been run on a laptop a decade ago.

STRUCTURAL BIOLOGY

Solved receptor and ligand complexes let us design the immune interface in silico and arrive at the bench with a ranked edit list instead of a screening campaign.

DEMAND IS ALREADY BANKED

Egg and embryo cryopreservation is now routine. The customers are identifiable today: they are already paying annual storage fees on embryos they cannot carry.

SUPPLY IS CONTRACTING

Commercial surrogacy is banned across most of Europe, Canada and Australia. Italy criminalised it abroad in 2024. Legal carrier capacity shrinks while banked embryos accumulate.

THE CURVES CROSS

Stored embryos rise, legal carriers fall, and the cost of engineering a host drops. That is the window this company is built in.

07 · TRACTION

Evidence accumulated to date.

MOUSE → RAT XENOPREGNANCY

DONE

A cross-species pregnancy carried to live birth. Mouse and rat share a congruent Ly49 NK background, so the result demonstrates endocrine timing and transfer execution rather than the tolerance edit stack. It establishes that the surgical and hormonal method carries to term.

IN SILICO PROGRAM COMPLETE

DONE

94 tolerance, decidualization, complement and coagulation loci compared across both genomes. Host edit targets ranked and mapped to residue level, giving a first-pass build sheet to take to the bench.

BENCH DE-RISKING OF HOST EDITS

IN PROGRESS

Binding, NK-killing, uNK density, complement and coagulation assays validate the engineered immune brake in vitro. Cheapest failures first, before any animal work.

HOST PLATFORM AND ENGINEERED LINE

NEXT

Stand up embryo engineering in a species with no off-the-shelf platform, then breed the validated, non-mosaic host line carrying the two consolidated edit units.

ROUND GOAL: FIRST MARMOSET PUP BORN FROM AN ENGINEERED GUINEA-PIG HOST

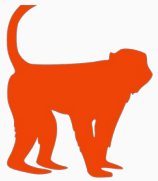
08 · GO TO MARKET

Revenue before the regulated market.

PHASE 1

PRIMATE RESEARCH MODELS

Marmoset and macaque models from engineered hosts, sold into pharma and CRO budgets that already exist. No human regulatory pathway, and it validates the platform on a paying customer.



BUYER: pharma and CRO procurement

PHASE 2

VETERINARY AND CONSERVATION

The same species-pair toolkit applied to endangered primates, where surrogate scarcity is the binding constraint and institutional funding already exists.

BUYER: institutions and programmes

PHASE 3

HUMAN APPLICATION

Gestation as a service in permissive jurisdictions, entered through fertility networks with the animal-model safety record already built.

BUYER: intended parents, via clinics

Each phase funds the next and de-risks the one after it. The human market is entered last, with a safety record rather than a promise.

09 · MARKET

The existing surrogacy market.

REVEALED DEMAND, PER YEAR

~6,000
US gestational-carrier cycles per year, people already paying for a third-party pregnancy

+20–25,000
people crossing borders annually because they cannot buy it legally at home

≈30,000
addressable intended-parent journeys per year, before any price-driven expansion

Unit economics: $75k price against roughly $17k of husbandry, IVF and delivery cost, leaving $58k of contribution per pregnancy, near 77%. The line that dominates surrogacy, human carrier compensation, is not in this stack.

BOTTOM-UP MARKET, AT $75K

$2.25B
SAM: 30,000 journeys a year, the demand already transacting

$9B
TAM: ~120,000 journeys a year across developed markets once price and legality stop rationing

Ethical and legal constraints, not demand, are what limit the growth of this market.

Wedge: intended parents who already have embryos in storage and no viable womb. Identifiable, already spending, highest intent.

Sources: Mordor Intelligence (2026), journey cost $150–250k · PMC6262674, US registry and cross-border ART · TBRC (2026), global surrogacy market.

10 · MARKET

The research primate shortage.

REVEALED DEMAND, PER YEAR

~70,000
non-human primates used in US research annually, mostly cynomolgus macaques

60%
of that supply was imported from China until the 2020 export halt

+500%
reported rise in cynomolgus prices (NIAID): $4–7k before 2020, $11–35k in recent years

Unit economics: $25k blended price against roughly $6k of husbandry and veterinary cost per animal, near 76% contribution. Custom engineered backgrounds price well above the blended rate.

BOTTOM-UP MARKET, AT $25K

$75M
SAM: 3,000 animals a year, roughly 4% of US demand

$1.75B
TAM: the ~70,000 animals used in US research each year at a blended rate

Supply, not demand, is the constraint: colonies are slow, unpredictable and geopolitically exposed.

Wedge: programmes that need a specific engineered background and currently wait years, or never get built at all.

Sources: NASEM, Nonhuman Primate Models in Biomedical Research (NBK593002) · NABR, implications of NHP shortages · NIAID price reporting · DDW (2024), primate pricing after the Covid boom.

11 · HUMAN BUSINESS MODEL

Today, most of the cost is the surrogate.

WHERE THE MONEY GOES NOW

Carrier compensation, agency fees and the legal apparatus around the contract account for the bulk of a $150–250k journey. The medical procedure itself is a minority of the bill.

OUR COST BASE IS HUSBANDRY

We replace all of that with IVF, veterinary care and animal husbandry, roughly $17k per pregnancy, which is why the price can fall to $75k and the margin still holds near 77%.

THE LINE IS THE ASSET

The engineered host line is heritable. It is bred once and reused indefinitely, so R&D is spent once per species pair and then amortised across every pregnancy that line carries.

WHAT THE CUSTOMER BUYS

A fixed price and a predictable schedule, in a jurisdiction where the transaction is legal, with no third-party human carrier to match, compensate or litigate.

Platform economics on a service price point: one engineered line, many pregnancies, no per-unit human labour.

12 · PRIMATE BUSINESS MODEL

A pipeline, not another colony.

WHY SUPPLY CANNOT ANSWER IT

Conventional colonies breed on their own schedule. Output is unpredictable, geopolitically exposed, and cannot be directed. The consequence is that custom disease models cannot be produced reliably at scale: a programme needing a specific engineered background waits years, or does not get built.

ENGINEERED HOSTS PRODUCE ON SCHEDULE

Animals are produced on a schedule we set, and the same germline toolkit that makes the host also makes the model. That turns primate supply into manufacturing, and makes custom research primates orderable rather than hoped for.

CUSTOM MODELS CARRY A PREMIUM

A wild-type macaque is a commodity at $11–35k. A specified, engineered background delivered on a date is not, and it is priced against the cost of the programme that cannot run without it.

THE SAME ASSET, SOLD TWICE

Every host line built toward the human programme also produces research primates. The revenue arrives years before the regulated market opens, on the same capital.

On this trajectory we expect to be among the largest producers of research primates by 2035.

13 · COMPETITION

Three ways to solve gestation.

APPROACH	WHERE IT STANDS	WHY IT DOES NOT SCALE
Human surrogacy	The status quo. A functioning $19B market.	Priced at $150–250k and illegal in most of the developed world. Supply is one carrier, one pregnancy.
Uterus transplantation	Clinically real, roughly 100 births worldwide.	Major surgery for two people, donor-limited, immunosuppression, comparable cost. It does not become a volume product.
Artificial womb	Partial support for extreme preterm infants, well funded.	Sustains a late-stage fetus. No demonstrated path to implantation and early placentation, which is the hard part.
Nilufer engineered host	Pre-clinical. Cross-species pregnancy already demonstrated in rodents.	Heritable edits mean capacity is bred, not recruited. Cost falls to husbandry economics.

Defensibility: the compatibility work for a species pair is the expensive part and it is now done; the engineered line is heritable IP that compounds; and the regulatory route runs through animal husbandry rather than surrogacy law.

14 · TEAM

Who is building this.

GÖNENÇ AKSU

Founder

Self-taught evolutionary biologist. Reached the final round of the Thiel Fellowship. Ran the mouse to rat xenopregnancy work and authored the cross-species compatibility program behind this deck. Also works on affective neuroendocrinology.

WHAT THIS ROUND ADDS

- Reproductive immunologist: owns the tolerance stack and the bench assays
- Reproductive biologist: embryo transfer and gestation management in caviomorphs
- Genome-engineering lead: owns the CRO relationship and the germline build
- Veterinary and animal-welfare lead: husbandry standards and ethics oversight

BUILD VERSUS BUY

The guinea pig has no established germline-engineering platform. Building that capacity in-house would take considerably longer and carry far less predictable timelines than contracting an established model-generation CRO, so the program is designed in-house and executed at a contract facility.

The scientific risk sits with the compatibility design, which is ours. The execution risk sits with a vendor that has done this work in other species.

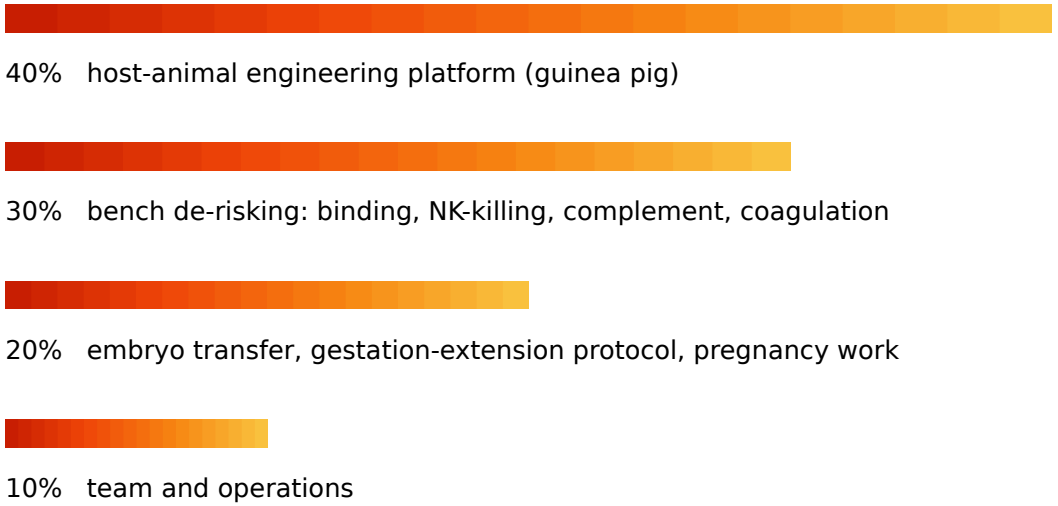
15 · THE ASK

$2M

PRE-SEED · ONE MILESTONE

Funds the program to its proof point: the first marmoset pup born from an engineered guinea-pig host, a primate gestated by another species, for the first time. Month 30.

USE OF FUNDS (INDICATIVE)



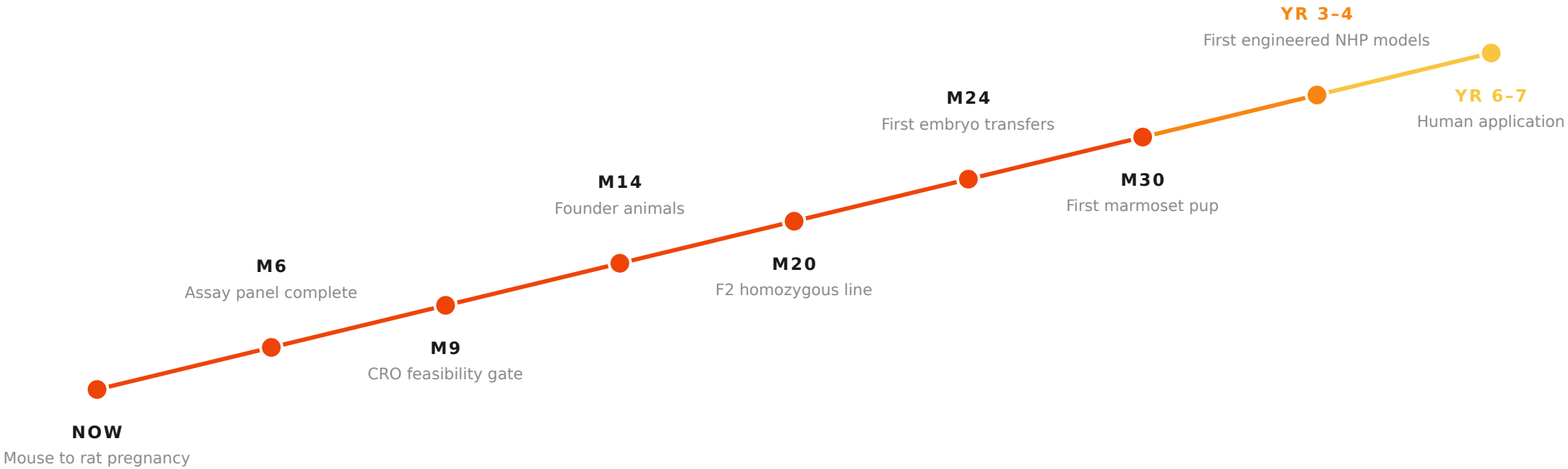
WHY THIS MILESTONE PRICES THE NEXT ROUND

- Every failure mode of the human program, immune, endocrine, decidual and coagulation, is settled in a $2M animal model instead of a $50M one.
- The host platform and the engineered line are durable, breedable IP. Every later species pair reuses them.
- After the pup, the capybara host is a scale-up inside one placental lineage rather than a new science project. That is the Series A.

16 · TIMELINE

Every milestone is a gate.

The near-term milestones are engineering tasks with known methods. Each one is a gate: if it fails, it fails cheaply and early.



PRE-SEED
this round
funds everything through the first marmoset pup

SEED
after the pup
scale to macaque hosts and first research models

SERIES A
after first NHP models
human-scale capybara host program

THE FUTURE OF REPRODUCTION.

Raising $2M pre-seed to put the first primate pup in an engineered host animal,
and open the door past the human surrogacy market.

CONTACT

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Generative AI tools were used in the preparation of this deck.