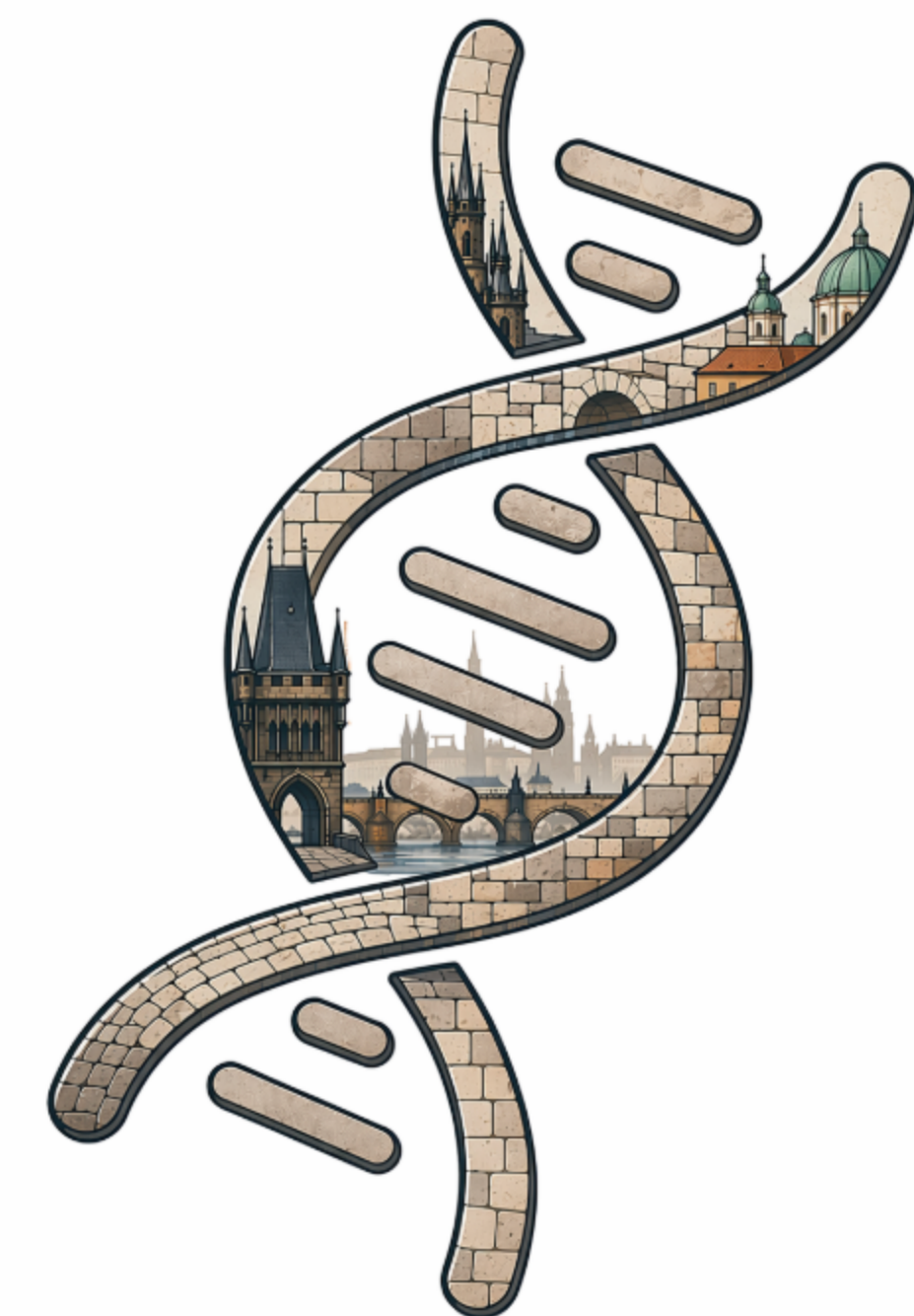


Self-sovereign genomics

Turning biology cypherpunk

8 May 2026
ETHPrague

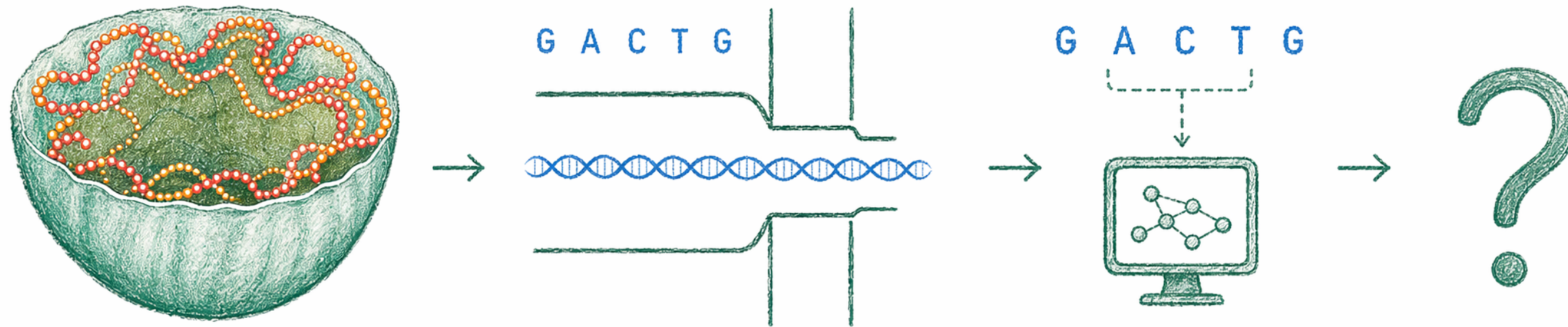
Péter Szilágyi
Dark Bio Founder



Genesis of most organisms



Solve all disease



- **Extraction** – dissolve the cell and pull DNA from the goo
- **Sequencing** – pull through hole, electric interference
- **Analysis** – give your genome to big tech and pray

Can we do better?

We've been here before

- **Software** – IBM ecosystem vs. open source movement
- **Finance** – SWIFT banking system vs. Ethereum network

Common pillars of open software / open finance

- **Sovereignty** – Do whatever (own device)
- **Extensibility** – Build whatever (open platform)
- **Shareability** – Share whatever (organic community)

Secure local storage



- **Dedicated:** offline and portable device
- **Encrypted:** everything needs 2 factors
- **Adversarial:** outlive firmware updates

- Storage device is **paired** with a companion app
- Encryption keys **split** between the two devices
- App does **all** authentication and authorization



Secure local execution

Compute comes to data

- Untrusted apps are pushed to the enclave
- Apps request the datasets they need to run
- User authorizes access, enclave sandboxes

Cryptographically signed execution

- Controlled dataset access and results
- Provenance and authorization audit trail

Cilantro Taste Test

Some people love cilantro. Others think it tastes like dish soap. Blame OR6A2, an olfactory receptor gene on chromosome 11. A 2012 GWAS (Eriksson *et al.*) pinpointed [rs72921001](#) as the SNP behind it. More copies of the C allele, more soap.

Your result: On the fence 🍷

Genotype	Risk-allele copies
C/A	1×C

You carry **one** copy of the risk allele (heterozygous). The effect is partial. You may notice a mild soapy note or none at all, depending on other genetic and environmental factors.

Fine print

One SNP doesn't tell the whole story. Taste is polygenic and shaped by diet, culture, and exposure. Two copies doesn't mean you hate cilantro, zero copies doesn't mean you love it.

Further reading

- Eriksson N *et al.* (2012). "A genetic variant near olfactory receptor genes influences cilantro preference." *Flavour* 1:22.
- NCBI dbSNP [rs72921001](#): population frequencies, genomic context, and submission history.
- NCBI Gene [OR6A2](#): olfactory receptor family 6 subfamily A member 2.

Technical details

Field	Value
rsID	rs72921001

Composable app platform

App Store publishing simplicity

- Searchable collection of genomic apps
- Open or closed; and free or monetized

Ethereum contract composability

- Apps can generate programmatic results
- Apps can build on top and use other apps

Composability beats specificity

I want to use frontier LLMs

- LLMs are amazing, but leak and reinvent things
- Let the LLM make new apps, using existing ones

I want to use homomorphic encryption

- FHE requires someone to encrypt, single point of failure
- The secure enclave can absolutely act as the trusted party

I want to run population and couple's studies

- Run individually and export zero knowledge proofs

Thank you

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