Unlocking the Full Potential of DNA Methylation Array Data

SAME METHYLATION DATA · DEEPER SCIENCE · MORE ARRAYS SOLD

Founded in 2020 on epigenetic aging research, TruDiagnostic has since broadened into a full platform spanning biomarkers, disease-risk models, and immune profiling, all on the same methylation data. It operates a CLIA-certified clinical lab and holds one of the largest private DNA methylation datasets in the world.

200K+ SAMPLES	82+ STUDIES PUBLISHED	115+ UNIV. PARTNERS	50+ AGING CLOCKS

What can DNA methylation data give you?

TruDiagnostic runs our algorithms on DNAm data, we can uncover an abundance of information such as the following:

50+ Next-Generation Epigenetic Clocks

Unlike Horvath and Hannum (2013), next-gen clocks are trained on real longitudinal functional or mortality outcomes — so they measure actual biological aging, not just the passage of time. These include:

- DunedinPACE — measures how fast someone is aging right now, rather than an accumulated age. It has an ICC of 0.96, which means it's reliable enough to catch real change in a matter of weeks to months — useful for a trial that can't wait decades for an answer.
- OMICmAge — as trained directly on mortality outcomes, which makes it the strongest choice when the question is long-horizon health risk rather than short-term change.
- **SymphonyAge** — breaks biological age down by organ system instead of giving one blended number, so it can show which system — heart, brain, liver, etc. — is actually driving the effect you're seeing.

Methylation Risk Scores (MRS)

5- and 10-year disease-risk models for 19+ conditions, grounded in peer-reviewed research (npj Genomic Medicine) showing methylation-based scores outperform polygenic risk scores at predicting real clinical outcomes. Unlike a fixed genetic score, MRS changes as biology changes, so it can track an intervention.

1,700+ Epigenetic Biomarker Proxies (EBPs)

Methylation-based proxies for labs you'd otherwise need a separate blood draw for. Like HbA1c vs. fasting glucose: an integrated average, not a single-day snapshot — which is why they outperform the directly-measured value in ~70% of head-to-head disease associations and carry higher reproducibility (ICC 0.82 vs. 0.5–0.7 for typical proteomics).

Immune Deconvolution

Uses DNA methylation signatures to estimate the proportions of immune cell subtypes in a blood sample. This allows researchers and clinicians to monitor immune aging, inflammation, or drug-induced immunomodulation without flow cytometry or complex lab work. 12-cell and 18-cell resolution, validated at r>0.95 against flow cytometry. It's a key EWAS confound control: cell-type composition is one of the biggest sources of false positives in a methylation study, and a published TruDiagnostic fasting study confirmed flagship endpoints (DunedinPACE, GrimAge, OMICmAge) are robust to this even under acute perturbation.

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Where Are the Opportunities for Collaboration?

Across pharma, wellness, and research, a central question for customers is: **What can this DNAm data unlock or prove?** TruDiagnostic provides valuable, publication-ready data, and each answer can result in additional arrays sold to a wide range of potential buyers.

Academic Researchers

Researchers can now ask — do I have the pilot data and partner I need to get this funded? TruDiagnostic can help secure both, resulting in a new Illumina customer.

CASE STUDY

Columbia's Dr. St-Onge and Dr. Barragán's CHAI grant proposal needed independent validation data and a named partner — TruDiagnostic ran its own clock and biomarker suite across thousands of self-reported short sleepers and menopausal women in its cohort at no cost, and wrote a letter of support.

THE VALUE

strengthened a grant application before a single new sample was drawn.

Pharmaceutical Companies

Pharmaceutical trials can now ask — is this drug actually slowing aging? TruDiagnostic can help find out, resulting in more value from array data you've already sold.

CASE STUDY

UCSD's placebo-controlled semaglutide trial had already answered its original question (body composition) using any Illumina methylation array data — TruDiagnostic ran its clock panel at no added cost, revealing a ~9% slower pace of aging, results published in Nature Communications (2026).

THE VALUE

turned existing trial data into a second, publishable finding, at no extra cost to the sponsor.

Commercial & Wellness Brands

Supplement and consumer-wellness brands can now ask — does this product actually work at the biological level? TruDiagnostic can help, resulting in a new category of Illumina customers.

CASE STUDY

SRW's 12-month supplement trial had only a self-reported outcome until TruDiagnostic processed and analyzed their own array data, turning it into a peer-reviewed publication in Aging (2025) showing real gains in grip strength and lung age.

THE VALUE

gave a consumer brand third-party scientific proof it couldn't generate on its own

WHY SHOULD MY CUSTOMERS COLLABORATE WITH TRUDIAGNOSTIC?

GRANT & STUDY DESIGN

Strengthening the Path to Funding

Before any sample is collected, TruDiagnostic can provide letters of support for grant applications, preliminary data access from its 200,000+ sample dataset, and direct input on study design and biomarker endpoints — making a funding proposal more competitive from the start.

ANALYSIS

Algorithms Run on Existing DNAm Data

The entire analysis pipeline runs directly on the IDAT files an existing Illumina array already produces. There's no new hardware to buy, no new array chemistry, and no lab handoff.

BIOINFORMATIC & PUBLICATION

A Complete Scientific Deliverable, Not Just a Data File

Every collaboration includes free bioinformatic analysis covering epigenetic clocks, biomarker proxies, disease-risk scores, and immune profiling. Customers who want to go further can access full publication support, from manuscript drafting through peer review.

WHAT DO RESEARCH & COMMERCIAL OUTPUTS LOOK LIKE?

Research outputs

Delivered as interactive HTML reports, with 1,700+ biological measurements in publication-ready form:

- **Epigenetic Clock Report:** 50+ biological age clocks (DunedinPACE, OMICmAge, SymphonyAge, PhenoAge, and more).
- **EWAS Report:** full methylome-wide association study with volcano/Manhattan plots, CpG identification, and KEGG pathway enrichment — links clock shifts to specific biological pathways.
- **EBP Report:** 1,700+ epigenetic biomarker proxies predicting proteins, metabolites, and clinical lab values.
- **Immune Deconvolution:** 12- and 18-cell panels validated against flow cytometry (r>0.95).
- **Disease Risk Scores:** 5- and 10-year methylation risk scores for 19+ conditions, plus diagnostic scores (MDS) with AMA PLA insurance codes.
- **QC Report:** beta value distributions, principal component analysis, and sample quality flags — every sample is QC-checked before results are returned.

Commercial outputs

Polished PDF reports built for individuals — easily interpretable and patient-specific, without the depth a researcher would need for publication. Includes a summary report, clocks like SymphonyAge and DunedinPACE (pace of aging), nutrition, inflammation, and toxin, among others.

WHAT ARE THE NEXT STEPS?

What do customers submit, and how? IDAT files plus a covariate spreadsheet, uploaded through TruDiagnostic's Portal, or submitted directly via API for institutions integrating at scale.

What arrays are supported? Any Illumina methylation array.

What does this service cost? Fee-for-service: Starting at $5k/ project for our full suite of bioinformatic services. Academic collaborations: Free of charge. Additional $50/consumer report

How do I start? Have your customer fill out TruDiagnostic's intake form, or contact Lauren Speck directly at lauren.speck@trudiagnostic.com.

We ran our analysis years ago — is that it? No. TruDiagnostic is a long-term scientific partner as the epigenetic field advances — a relationship that compounds in value over time. Re-analysis is turning up significant correlations that didn't exist originally, and novel MRS models are revealing disease-risk dimensions that simply weren't available as outputs when the data was first processed. For example, a 2022 ketamine study returned a null result; the same samples were re-analyzed with today's algorithm suite and published in Translational Psychiatry in 2025.

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