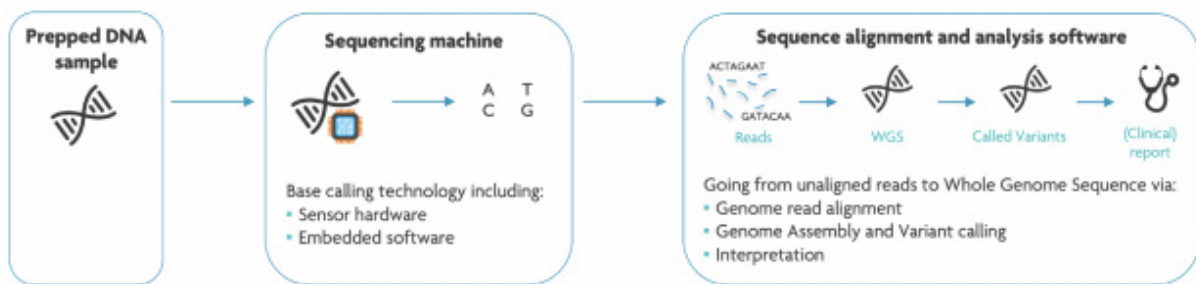


# BRINGING HIGH-PERFORMANCE COMPUTING TO GENOMICS

Imec's Exascience Life Lab has leveraged its high-performance computing expertise to build a robust high-performance sequencing software platform for parallel processing of DNA sequencing data and running advanced genomic application programs efficiently, reliably and quickly. The platform allows to optimize software at every step of the genomics pipeline. From base-calling up to genome interpretation.



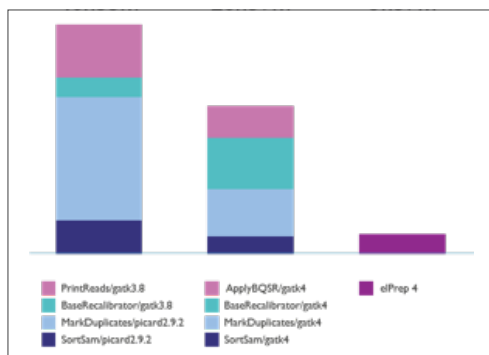
### Focus 1: Embedded software for base-calling

- Optimized machine learning and analysis algorithms for base calling
- Faster, lower power signal interpretation with same accuracy

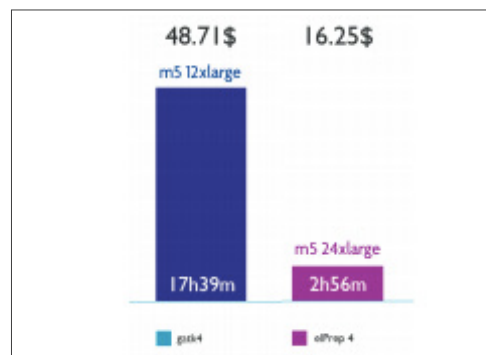
### Focus 2: Downstream analysis—performance improvements

- Joint optimization with domain experts or from known algorithms and implementations
- Significant runtime and cost reductions

## ELPREP: DNA SEQUENCING 10X FASTER AT 1/3<sup>RD</sup> OF THE COST



elPrep is up to tenfold faster than conventional solutions.



Comparison of cost for fastest GATK4 run vs. fastest elPrep run.

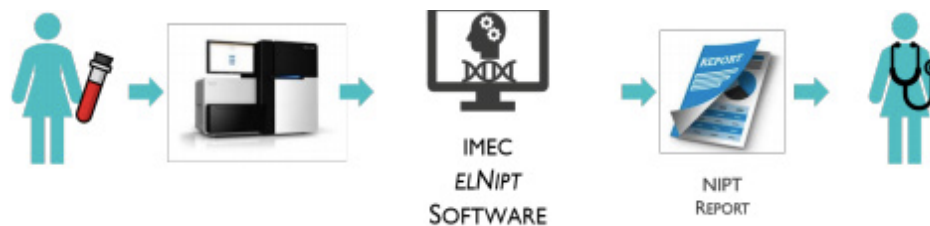
To showcase the capabilities of the platform, we developed and released elPrep, a drop-in replacement for SAMtools, Picard and GATK, that produces identical results as these widely-used de-facto standard tools. elPrep is up to 10x faster than these standard tools, at 1/3 of the cost.

### ELPREP BENEFITS:

- Speed & cost: elPrep is up to 10 x faster than currently used tools at a third of the cost
- Fully configurable to your pipeline (such as mark-duplicates, mark-optical-duplicates, sorting by coordinate order or queryname, base quality score recalibration, etc)
- Easy set-up on-premise or in the cloud (single binary without dependencies on Python, Java, or libraries like SciPy, BLAS or R)
- Validated scientifically and by industrial and clinical partners

ElPrep is available open source on GitHub (<https://github.com/ExaScience/elprep>), under an AGPL license. Other commercial licensing schemes can be discussed. ElPrep can be extended with custom steps or adapted to your needs or particular pipelines.

## USE CASE ELNIPT: FULL END-TO-END SOLUTION FOR NON-INVASIVE PRENATAL TESTING



ELNIPT, an end-to-end solution for NIPT. Raw sequence data goes in, NIPT report comes out.

As a specific instantiation of elPrep, we developed elNIPT as an end-to-end solution for the interpretation of NGS data for non-invasive prenatal testing.

### ELNIPT BENEFITS:

- Easy to use, complete end-to-end solution: raw NGS data in, NIPT report comes out
- Speed: 3x faster by build on top of elPrep
- Developed in partnership with bio-informaticians, used in a clinical setting

## PROVEN TRACK RECORD

We work closely with many partners on future developments of elPrep on top of that, we have created collaborative end-to-end demonstrators with a variety of partners.



Portfolio of partnerships and clients that can be disclosed.

## WHY IMEC? NEXT GENERATION HIGH PERFORMANCE COMPUTING SOFTWARE APPLIED TODAY.

- Proven track record with applications that outperform the state of the art significantly
- 10 years of experience applying high performance computing in life sciences
- Fully customizable to your pipeline needs
- Can be applied across the genome sequence analysis spectrum, from base calling over variant calling to genome analyses
- Reduce R&D effort by enabling hardware-software co-development (e.g. base calling)

**WANT TO KNOW MORE? DOWNLOAD OUR WHITEPAPER ON [WWW.IMEC-INT.COM/WHITEPAPER-GENOMICS](http://WWW.IMEC-INT.COM/WHITEPAPER-GENOMICS)**

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[WWW.CONTACTIMEC.COM](http://WWW.CONTACTIMEC.COM)

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