

Innovative h-BN Nanopore Fabrication

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Problem Statement

With **limited control** over **pore size** and **shape**, existing nanopore fabrication methods fall short in **precision** and **reproducibility**, hindering critical advancements in **DNA sequencing**, **molecular separation**, and **energy storage**.

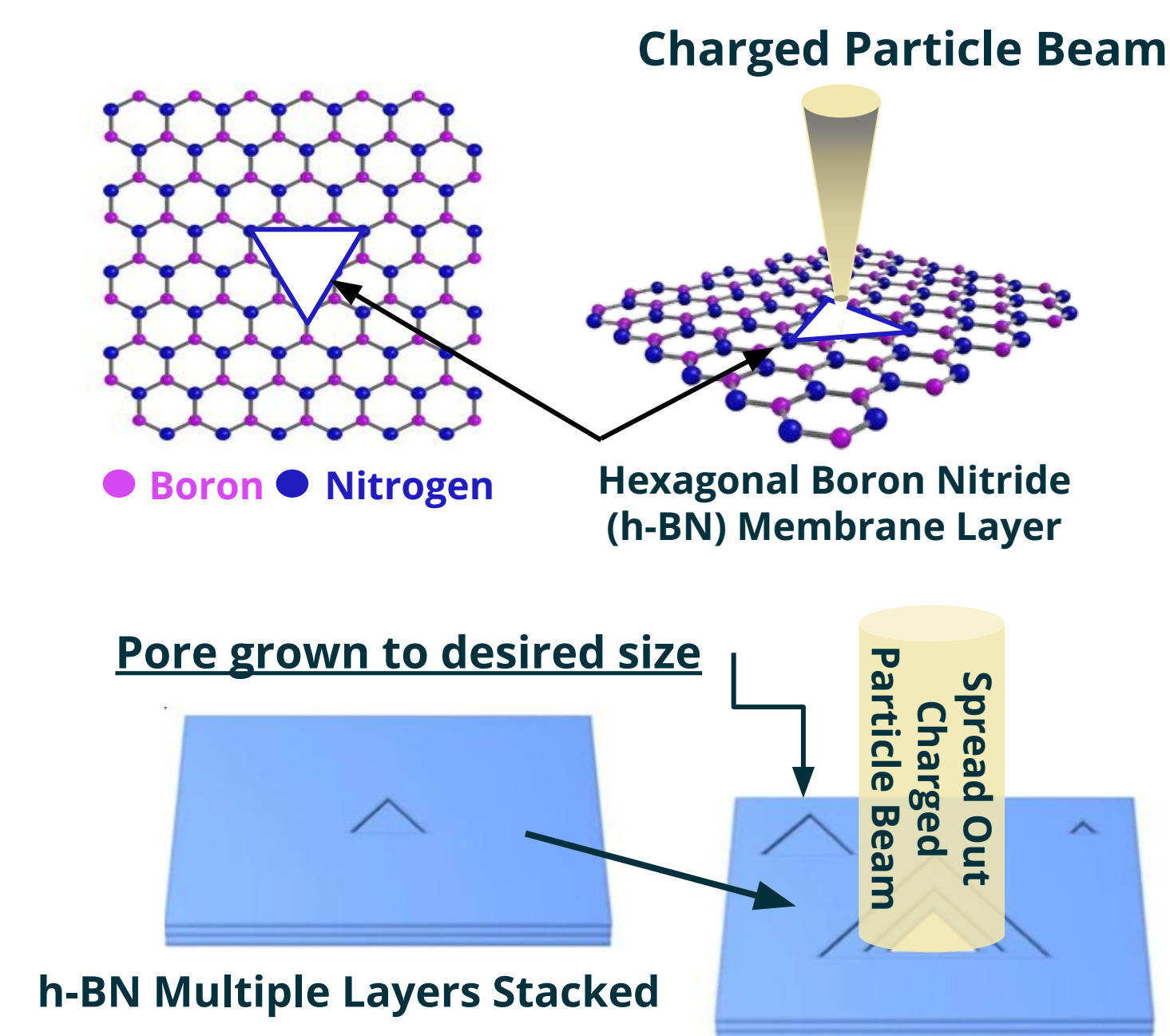
Our Solution

Precise control over pore size and shape

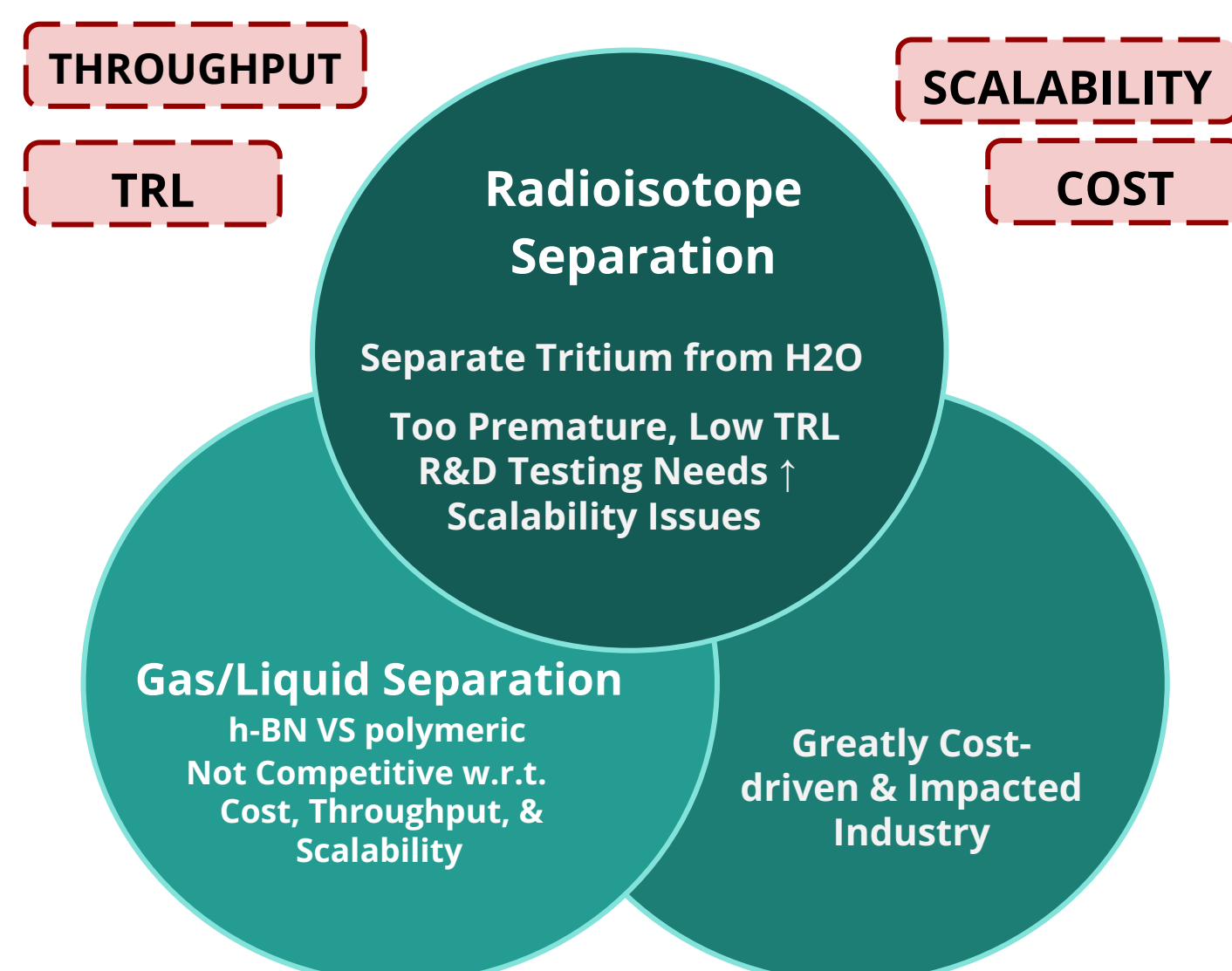
High consistency in reproduction

Improved selectivity in separation technologies

Irradiating Atomically-Thin h-BN Membrane Layer(s) with Charged Particles to Control Pore Size & Shape in Real Time



Market Research



Performance Metrics Comparison with Competing Solutions

Materials:

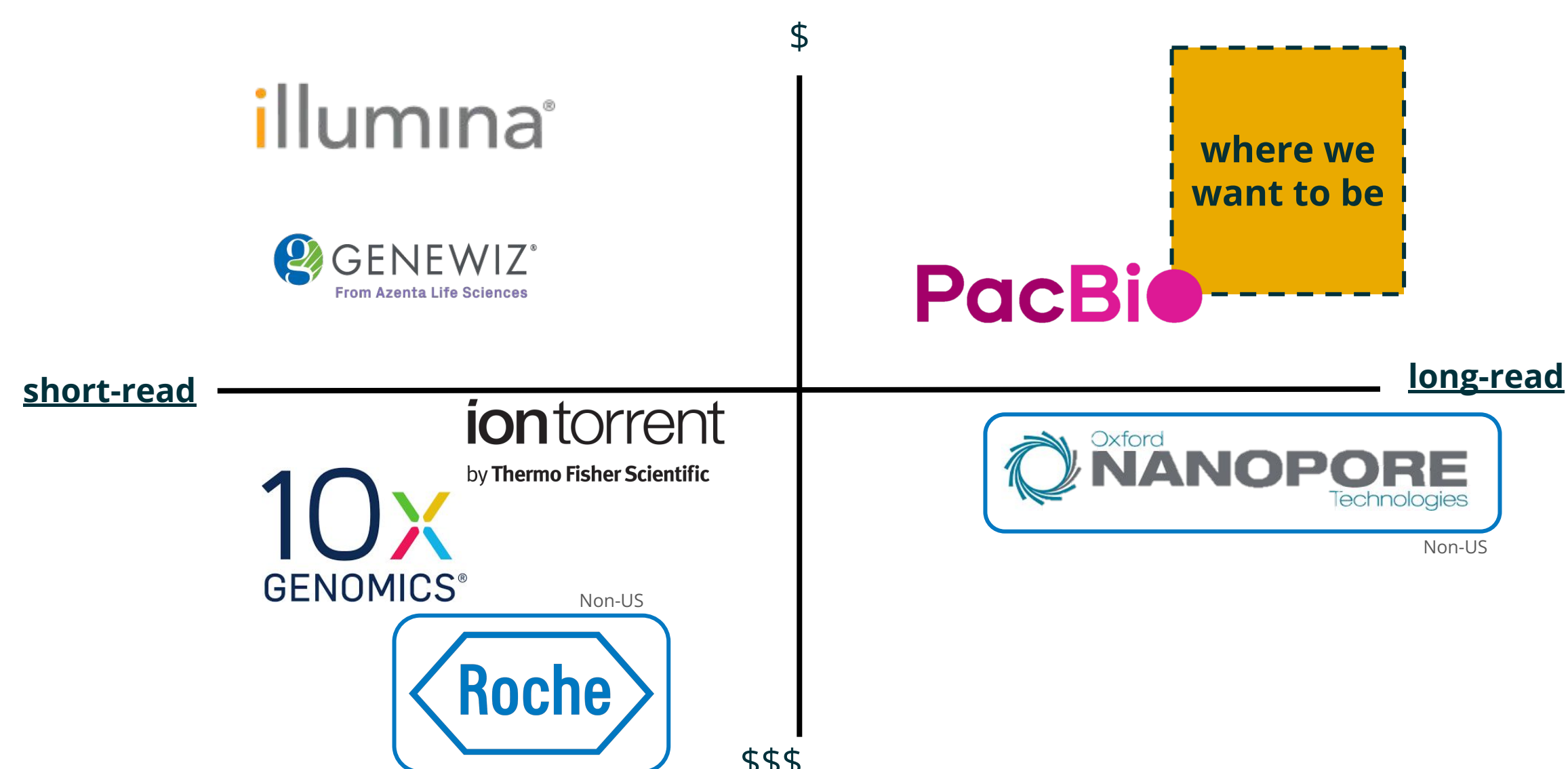
Properties	Graphene	Polymer	Other Ceramics	hBN	Market priority
Durability	★★★★☆	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
Stability	Chemical	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
	Pore Geometry	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
	Electro-chemical	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
	Thermal	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
Electrical Insulation	★★★★☆	★★★★☆	★★★★☆	★★★★★	⚡️ 🧬 🏭 ⚛️
Cost	\$\$\$	\$	\$	\$\$\$\$	⚡️ 🧬 🏭 ⚛️

Fabrication method:

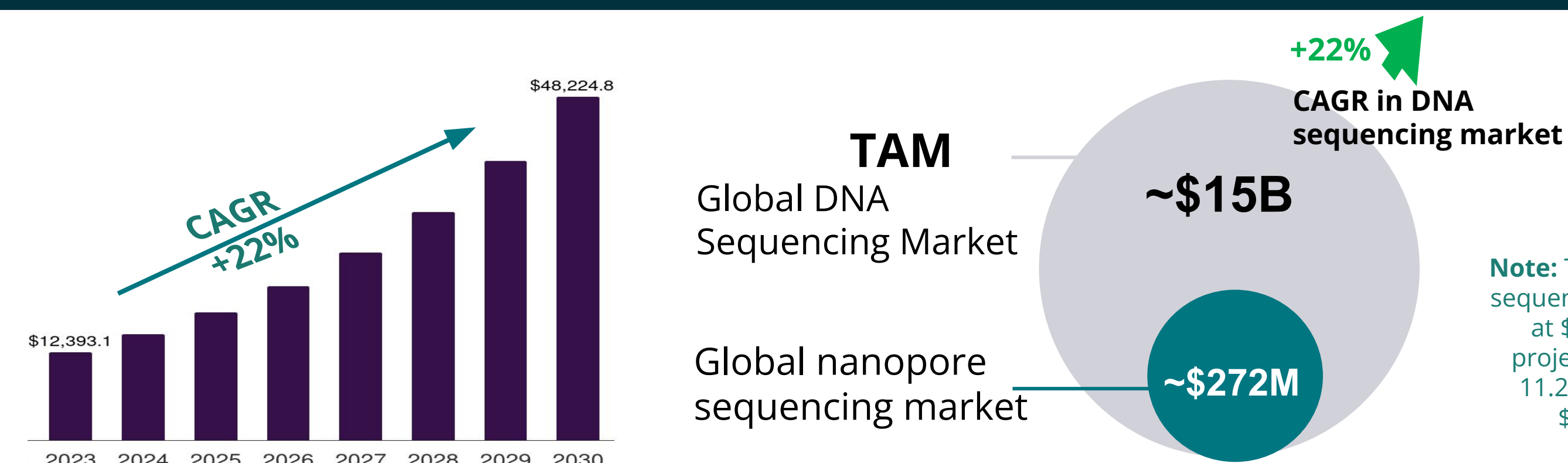
Properties	Etching	Lithography	Focused Ion Beam	Electron Beam	Market priority
Precision	★★★★☆	★★★★☆	★★★★★	★★★★★	🧬 ⚛️
Controllability	★★★★☆	★★★★☆	★★★★★	★★★★★	🧬 ⚛️
Reproducibility	★★★★☆	★★★★☆	★★★★★	★★★★★	🧬 ⚛️
Size Range	★★★★☆ >10 nm	★★★★☆ 100s nm	★★★★★ <1 nm	★★★★★ <1 nm	🧬 ⚛️
Material Compatibility	★★★★☆	★★★★☆	★★★★★	★★★★★	⚡️ 🧬 🏭 ⚛️
Scalability	★★★★☆	★★★★☆	★★★★☆	★★★★☆	⚡️ 🧬 🏭 ⚛️
Cost	\$	\$	\$	\$	⚡️ 🧬 🏭 ⚛️

Legend: ⚡️ Batteries 🧬 DNA Sequencing 🏭 Gas/liquid Separation ⚛️ Radioisotope Separation

Global DNA Sequencing Competitive Landscape



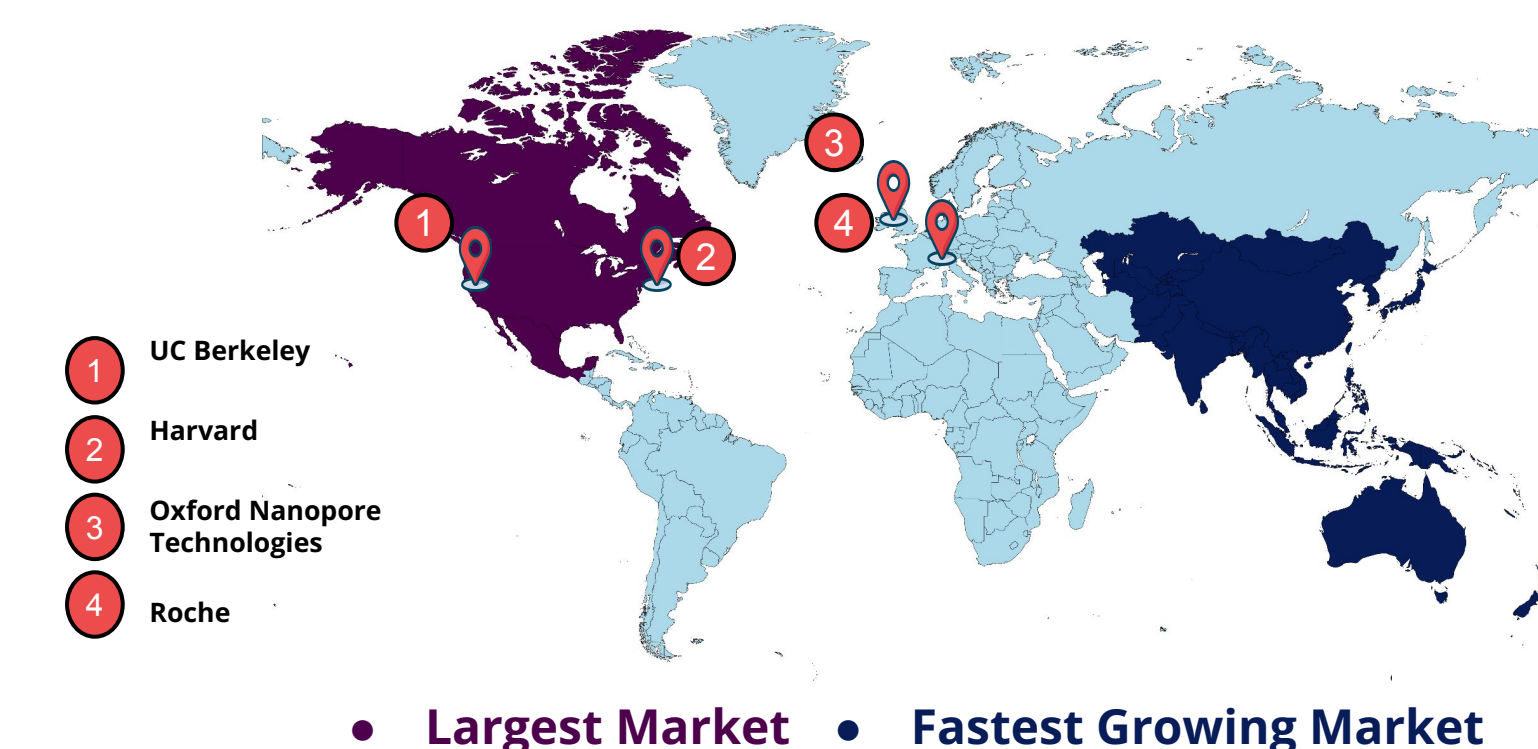
Global DNA Sequencing Market Size and Growth



Nanopore DNA Sequencing Market & Patent Landscape

Whole Genome Sequencing Market

Trends, by Region, 2025-2030

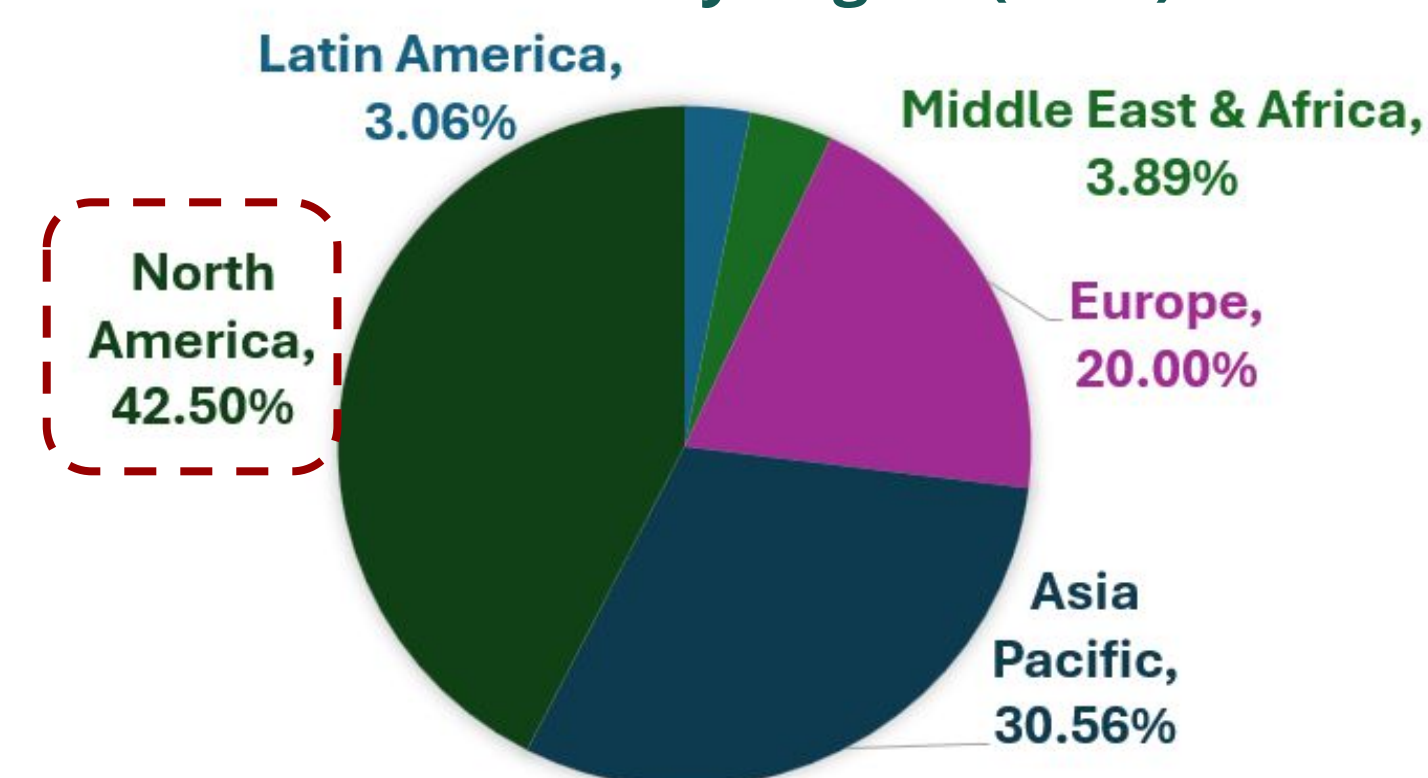


3 Active Nanopore Membrane Patents Discussing h-BN

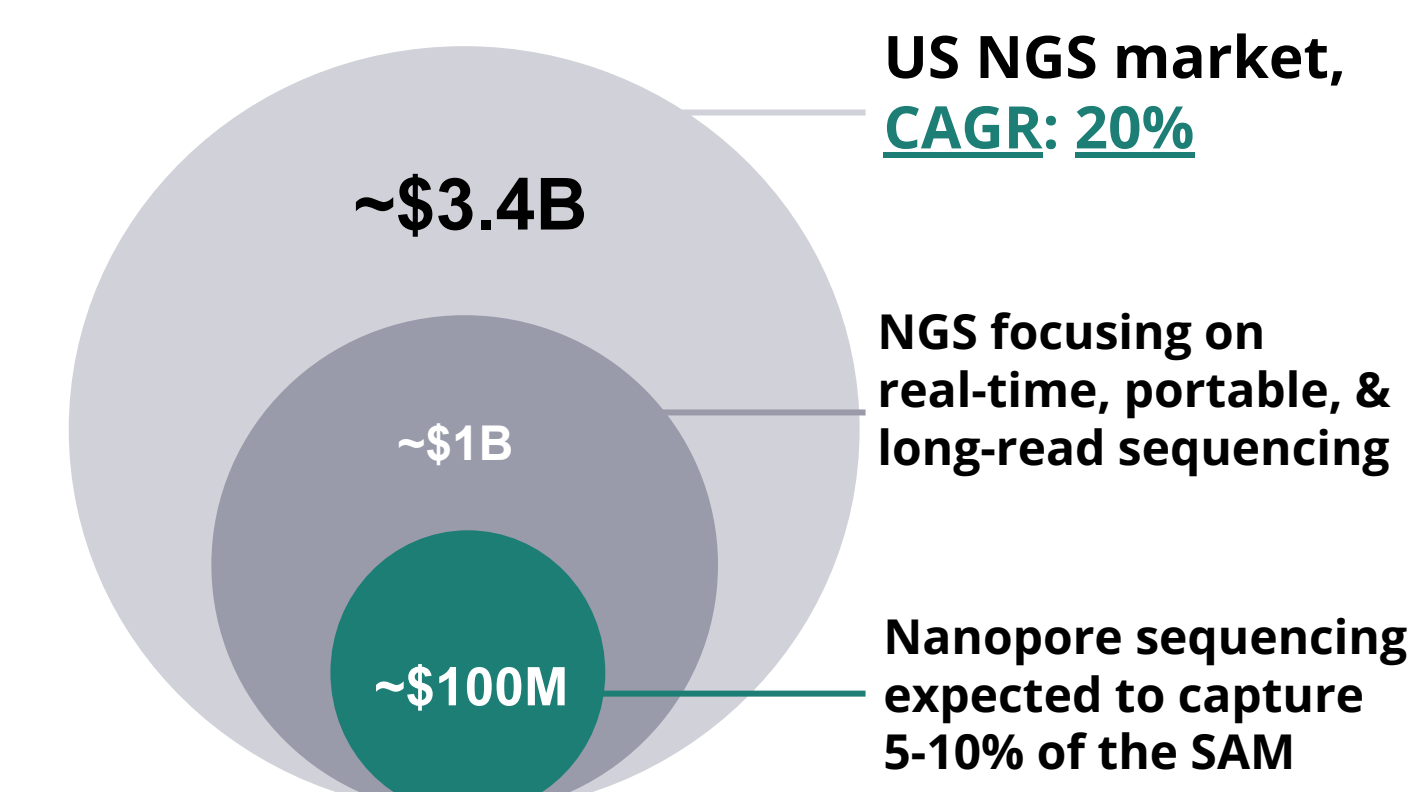
3 h-BN Patents Owned by Universities

0 Solid-State Nanopore Patents Licensed

Market Share by Region (2023)



US Nanopore Sequencing Market Potential



Acknowledgements

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