

## **Accelerate and De-risk Materials Decisions for Semiconductor R&D With IMI Labs from Intermolecular**

**IMI Labs for Semiconductor leverages Intermolecular's high-throughput experimentation platform, materials expertise and analytics to speed exploration, discovery, characterization and selection of advanced materials**

- **Addresses the growing cost and complexity of semiconductor materials research and selection**
- **Opens up IMI platform to the industry, with flexible range of standard and customized service offerings**
- **Makes it easy to explore, test and characterize multiple materials simultaneously**
- **Provides access to new or exotic materials that are risky to bring into billion dollar fabs or production facilities**
- **Delivers fast, comprehensive, high quality data that accelerates critical materials decisions**

SAN JOSE, Calif., June 20, 2016 /PRNewswire/ -- [Intermolecular](#), Inc. (NASDAQ: IMI), the trusted partner for advanced materials innovation, today announced IMI Labs for Semiconductor, a materials innovation service to help semiconductor companies explore, discover and characterize new materials. With IMI Labs, semiconductor manufacturers now have broad access to Intermolecular's experimentation platform, materials expertise and data to accelerate materials decisions that have the potential to unlock substantial innovations.

Early identification of new, suitable materials gives semiconductor companies a significant competitive advantage. The pace of materials exploration in the semiconductor industry has increased exponentially since the 1980s, when only a handful of materials were used. Since 2000, 50 new materials have been developed for semiconductor applications, often in complex compounds or stacks. At the same time, semiconductor manufacturers often conduct R&D on production lines, potentially incurring significant risks when introducing a new material.

"The future of innovation in the semiconductor industry is highly dependent on the discovery and selection of new complex materials," said Bruce McWilliams, president and chief executive officer, Intermolecular, Inc. "With IMI Labs, semiconductor manufacturers can experiment with various material combinations without bringing new materials into their production fabs. By leveraging our high-throughput platform, expertise and analytics, customers can reduce the time and risk of new materials research and accelerate the materials decision-making process."

### **IMI Labs for Semiconductor Overview**

Services available today from IMI Labs for Semiconductor take their roots from work Intermolecular started for the fast growing \$77 billion memory market, specifically DRAM and non-volatile memory (NVM). The company is also expanding its offering to address the global \$229 billion digital integrated circuits market. IMI Labs for Semiconductor provides the following benefits for semiconductor materials research:

- | Evaluate and experiment with new materials such as Chalcogenides
- | Experiment with combined stacks or new elements interfacing with multiple layers
- | Expanded empirical data
- | Ability to predict or validate experimental physical and electrical properties with simulation & empirical modeling
- | R&D equipment ready to perform experiments
- | Ability to test new materials before introducing them into production environments

Examples of IMI Labs for Semiconductor services include:

- | High-throughput site-isolated ALD and PVD deposition of multiple materials with in-situ anneal
- | Comprehensive PVD and ALD-based evaluation of several different dielectric, electrode, or interlayer materials in a MIM capacitor film stack
- | Comprehensive PVD-based evaluation of multinary materials (> 5 elements) and metal/metal nitride electrodes
- | Extensive physical and electrical characterization
- | In-depth evaluation of promising materials candidates with temperature dependent testing, stress testing, and Internal Photon Emission (IPE) testing

## **Supporting Quotes:**

"Advanced materials are essential to economic security and human well being, with applications in industries aimed at addressing challenges in clean energy, national security, and human welfare, yet it can take 20 or more years to move a material after initial discovery to the market," according to the Materials Genome Initiative website. "Accelerating the pace of discovery and deployment of advanced material systems will therefore be crucial to achieving global competitiveness in the 21st century."

"New material selection and evaluation was one of the hardest parts of 14 nanometer logic development," said Dr. Sanjay Natarajan, former Intel VP and 14nm program manager.

"The industry is facing major challenges ranging from architecture choices to materials selection. The next wave of semiconductors will require inventing over 40 materials," said Dr. Scott E. Thompson, IEEE fellow, U. Florida.

**Tweet This:** IMI Labs from @IMIMaterials accelerates materials decisions for #semiconductor R&D and lowers risk of bringing new materials into fabs.

## **Supporting Materials:**

- | [IMI Website](#)
- | [IMI Labs Webpage](#)
- | [Resources/Images](#)

## **About Intermolecular, Inc.**

Intermolecular® is the trusted partner for advanced materials innovation. Advanced materials are at the core of innovation in the 21<sup>st</sup> century for a wide range of industries including semiconductors, consumer electronics, automotive and aerospace. With its substantial materials expertise; accelerated learning and experimentation platform; and information and analytics infrastructure, Intermolecular has a ten-year track record helping leading companies accelerate and de-risk materials innovation.

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