

LarmorBio Announces New Publications Demonstrating the Potential of MMR in Bioprocessing and Stem Cell Production

Proprietary Methodology Shows Potential to Improve Yield, Quality and Function of Cell Derived Therapies

BOSTON, MA, UNITED STATES, March 4, 2025 /EINPresswire.com/ -- LarmorBio, a Massachusetts Institute of Technology (MIT) start-up pioneering the use of microscale magnetic resonance (MMR) relaxometry for life sciences research and clinical diagnostics, is announcing several recent peer-reviewed publications. These publications build upon the supporting evidence that MMR can be used to non-invasively assess cellular senescence, viability, and proliferation without the need for dye or antibody labelling, enabling early, near real-time intervention that is impossible with today's bioprocessing methods. These milestones represent a significant step toward addressing critical unmet needs in scalable cell and gene manufacturing. MMR holds the promise to improve cell potency, reduce contamination risk and improve production yields in an entirely new way.

The LarmorBio technology platform which was originally developed by researchers and the Massachusetts Institute of Technology (MIT) and the Singapore-MIT Alliance for Research and Technology (SMART), offers a rapid, real-time non-invasive approach to monitoring live cell health. By monitoring intracellular magnetic and redox properties, the proprietary technology enables not just crucial information on cell viability and proliferation, but also offers unparalleled high-precision phenotyping of live cells without disrupting the bioprocessing environment.

"The unique properties of MMR allow us to assess the complex role of iron in cellular metabolism, offering an unparalleled window into live-cell function in bioprocessing," said Yie Hou Lee, Ph.D., Scientific Director SMART, Assistant Professor Duke-NUS Medical School. "This technology may be seamlessly integrated into bioreactors and industrial process controls, allowing continuous, real-time monitoring without direct sampling."

Key Findings from Recent Studies:

- In-line Bioreactor Monitoring: [A study published in Analytical Chemistry](#) demonstrated a prototype MMR system which successfully monitored HEK293 and CHO cell viability and density in bioreactor runs in real-time. The findings showed strong correlations ($R^2 = 0.91$) between LarmorBio's measurements and the percentage of viable cells, highlighting the potential for continuous, non-invasive in-process monitoring to enable early interventions and improve

manufacturing consistency.

- Stem Cell Quality and Senescence Detection: [A study in Stem Cell Therapy and Research](#) validated the ability of microscale MR to detect chondrogenic potential and cellular senescence in mesenchymal stromal cells (MSCs) used for cell-based cartilage repair. The study demonstrated that the association of intracellular oxidized iron as detected by MRR with therapeutic efficacy outcome and cell yield, as well as novel early interventions, such as Vitamin C supplementation, to improve the overall quality of MSC therapies for better regenerative medicine outcomes.
- Monitoring Stem Cell Differentiation for Neurological Therapies: [Another study in Stem Cell Therapy and Research](#) explored the use of MMR to monitor the differentiation of inducible pluripotent stem cells (iPSCs) into spinal cord progenitor cells as part of safety and quality assessment for a novel, cell-based treatment of spinal cord injuries and neurological disorders. The study demonstrated that MMR accurately tracks differentiation progress into progenitor cells as well as their final terminal cell types, allowing manufacturers to predict, identify and address problems early in the production process.

“By improving final product quality while reducing costs we believe our proprietary MRR technology will play a pivotal role in the next generation of bioreactors and cell therapy production lines” said Rodolfo Rohr, founding CEO of LarmorBio. “We are actively engaging with commercial partners in life sciences and cell manufacturing to bring this technology to market at scale.”

About LarmorBio:

LarmorBio is a pioneering life science research and clinical diagnostic company that has developed a microscale magnetic resonance technology for measuring critical biological data in blood and cell samples. The primary application of the technology is the ability to measure oxidative stress levels in blood which plays a critical role in early metabolic dysregulation and chronic disease progression. Prior to LarmorBio’s platform, no technology could directly measure oxidative stress in under five minutes at low cost by an untrained user at the point of care. The company currently has deployed the system globally in partnership with major research hospitals and leading healthcare companies and has 14 peer-reviewed publications supporting the system’s clinical utility.

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