Meeting the Challenges of Stem Cell Processing

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The era of research and clinical study of human embryonic stem and induced pluripotent stem (ES/iPS) cells is now clearly upon us, and is further being fueled by rapid technological advancements and their great potential utility. These exciting developments are creating opportunities to study and treat diseases in ways not possible just a few short years ago, but they are also creating the need for cell analysis, purification, and processing capabilities that are beyond the reach of conventional technologies. ES/iPS cells grow in tight aggregated clusters, and the majority of their differentiated progeny are adherent and/or colonized cell types that do not adapt well to approaches requiring dissociation or cell suspensions. To address these needs, an *in situ* cell analysis and purification technology (LEAP™) has been developed to process cells right where they are grown – on a culture surface. LEAP, based on high-throughput laser processing of cells, has been validated for processing of ES/iPS cell colonies and their differentiated progeny and offers standardized, non-enzymatic ES/iPS colony passaging, controlled embryoid body formation with increased differentiation yield, higher throughput iPS cell line generation and high purity/yield purification of adherent cells and colonies. Thus, LEAP provides key technical capabilities to advance the use of stem cells in research, drug discovery, and clinical applications.