

Automation of Cell Staining

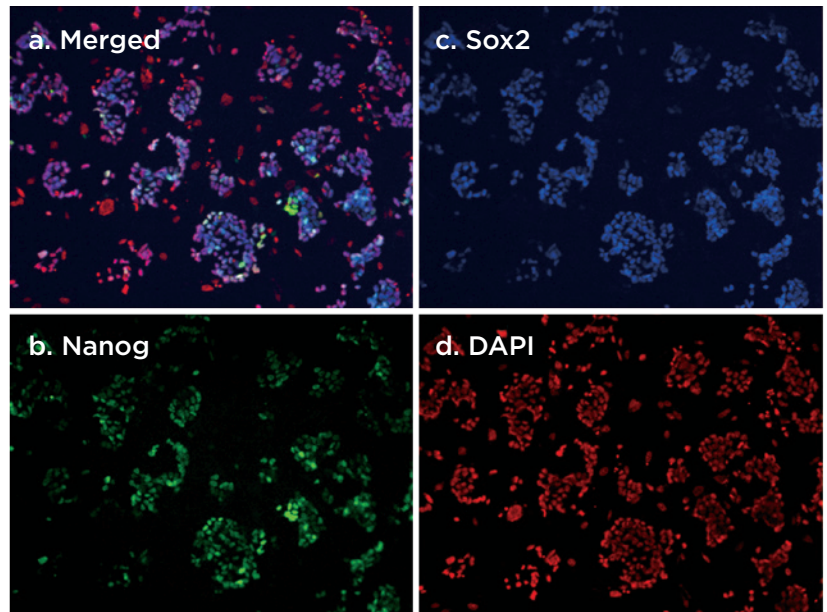
Using the Biomek 4000 Laboratory Automation Workstation

Manual cell staining of cardiomyocytes, either to characterize antigen expression or to assess cell health, is labor-intensive and time-consuming. Here we demonstrate automation strategies using the Biomek 4000 Laboratory Automation Workstation that provide well-resolved and reproducible detections of intracellular markers in murine embryonic stem cells and differentiated cardiomyocytes using PerFix-nc fixation and permeabilization reagents with a no-wash protocol.

All liquid handling steps were performed on a Biomek 4000 Laboratory Automation Workstation. Sixteen wells required less than an hour to prepare for imaging. Cells were stained with either stem cell markers (A) or with myosin heavy chain (B). DAPI (red) was used to mark the locations of nuclei.

- Rapid Cell Preparation Time – The Biomek 4000 Workstation provides walk-away automation of the cell staining process of 16 wells in approximately 1 hour.
- Flexible Automation – Applicable to a number of different cell staining procedures.

A



B

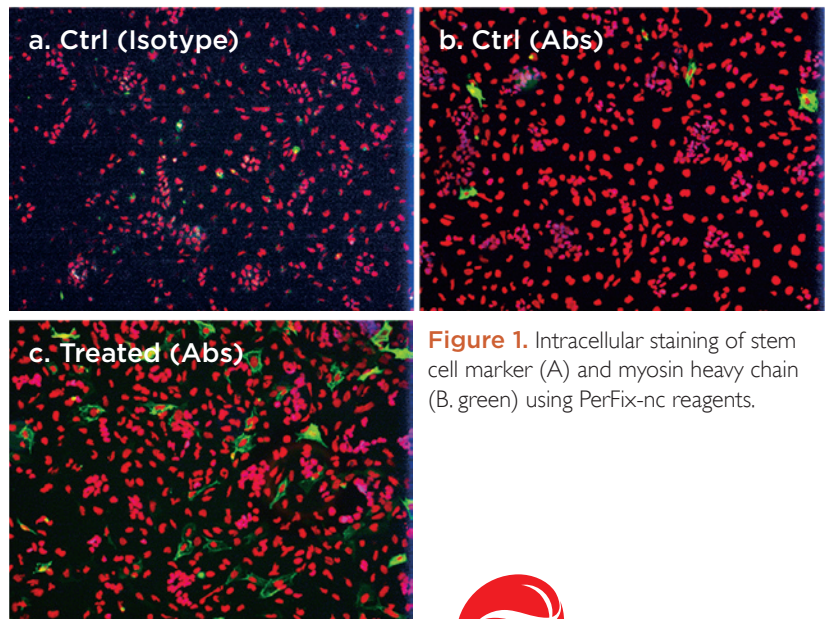


Figure 1. Intracellular staining of stem cell marker (A) and myosin heavy chain (B, green) using PerFix-nc reagents.

Discovery
in motion.

 **BECKMAN
COULTER**

Life Sciences

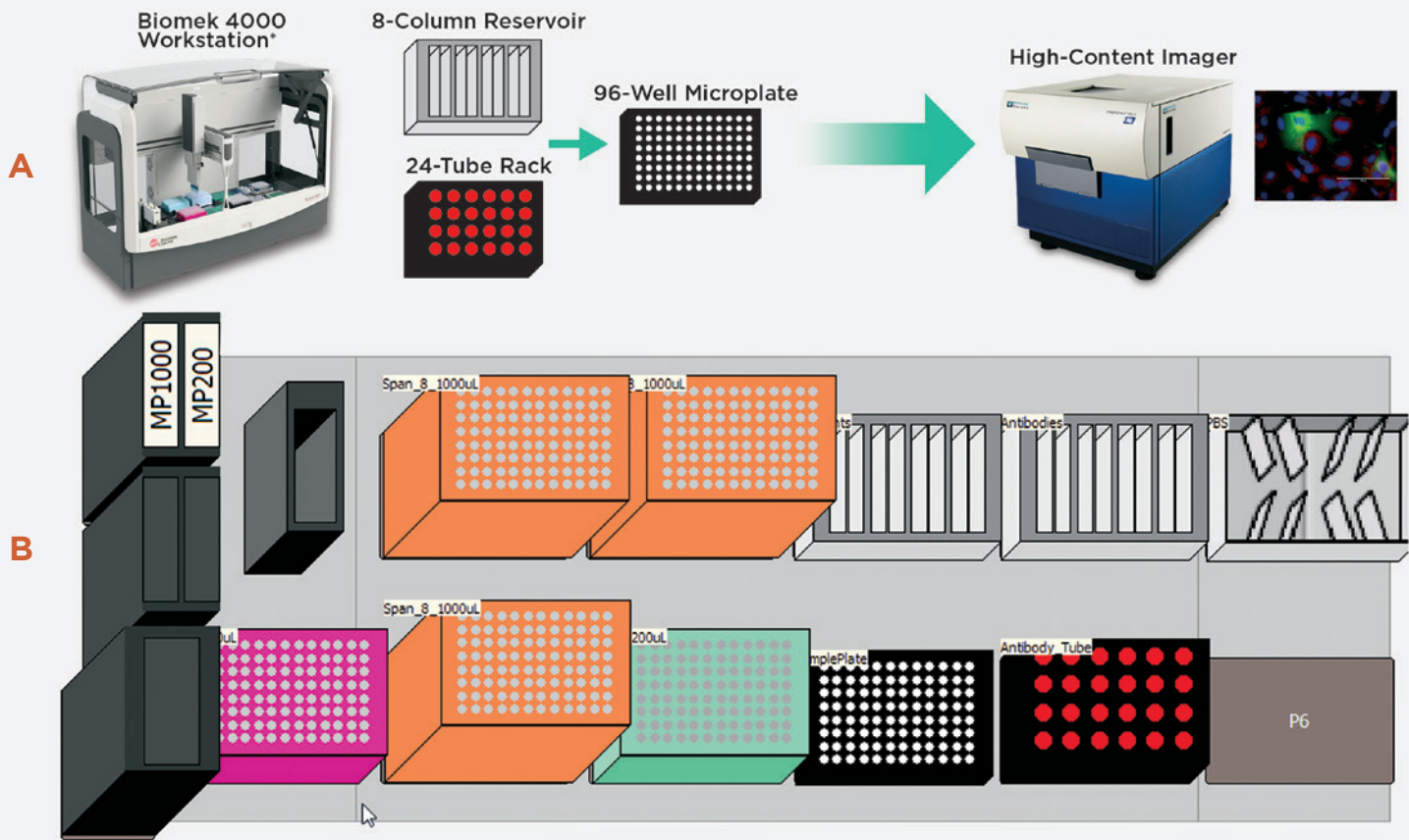


Figure 3. A. Shown above is the workflow for the Biomek 4000 Laboratory Automation Workstation and Molecular Devices ImagXpress system for Cell Staining. **B.** Deck layout for automated cell staining using the Biomek 4000 Laboratory Automation Workstation.

SUMMARY

This work demonstrates that cell staining sample preparation workflows can be automated with relatively standard components and process steps on our new Biomek 4000 Laboratory Automation Workstation. Automation can achieve preparation timesavings with large numbers of samples while maintaining at least equivalent results and precision compared with manual processing. As a result, it is possible to perform large cell staining studies in an expandable manner with walk-away capability.