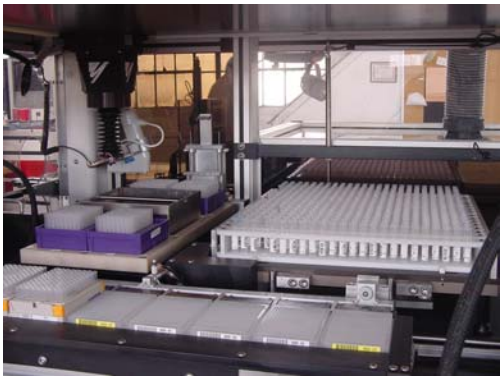
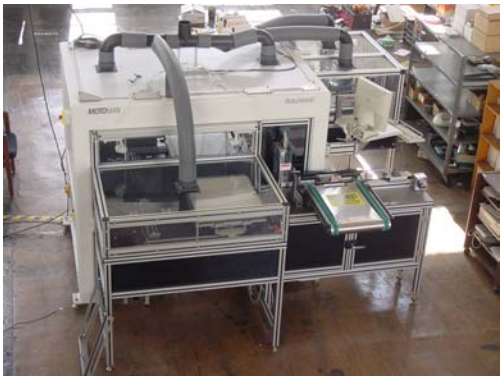
Compound Dissolution and Plate Prep System

Background

Advent Design's client for this application is a major pharmaceutical company who was looking to automate the preparation of compounds from their compound library for a high throughput screening application. Because this client had a strong desire to prepare their compounds in an inert environment, the dissolution and plate prep process had to be linked into a single automated system.



Source Tubes and Plates in Robot Work Envelope



Robotic Workstation for Plate Prep

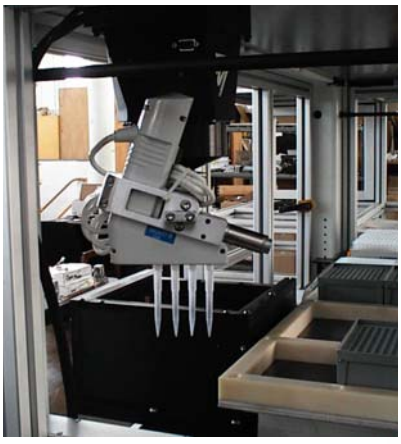
System Description

Advent developed two pieces of equipment to perform this operation. The first individually uncapped each of the source vials in a 384-tube set, read the barcode on each vial, and created the initial compound database for a run.

The second machine was built using a Motoman Robotworld robot platform with 2 arms. In each robot arm a 4-channel pipettor was fixed. The Robotworld arms were programmed to transfer compounds from the 1-ml source vials to wells in up to nine 384 well microtiter plates.

Once the vials are uncapped in the first machine, they are fed into the front end of the second machine in custom racks. Each rack is automatically fed into the inert environment. Along the way, the barcode is read again on each vial to verify the compound data matrix, and DMSO added to dissolve the compound.

After all of the racks are prepared, a pallet shuttles the source vial racks into the robot work envelope for plate prep. Plates are automatically fed into the inert environment, the barcode read on each plate, and the plates registered for pipetting.



Pipettor in Robot Arm

Impact

Since the plate prep process has to be performed in a nitrogen environment, automating the process was the only logical conclusion. In addition to providing redundant data protection for compound identification, the automated system also increased the throughput of the procedure ten-fold.

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