

# Automation of Assay Genie MR-proANP and MR-proADM ELISA Kits on Dynex DS2 Instrument

## Introduction

The Assay Genie MR-proANP (Mid-Regional Pro-Atrial Natriuretic Peptide) and MR-proADM (Mid-Regional Pro-Adrenomedullin) ELISA kits are crucial for the quantification of these biomarkers in clinical research, particularly in studies related to cardiovascular disease and heart failure.

Elevated levels of MR-proANP and MR-proADM are associated with cardiac stress and diastolic dysfunction, as highlighted in the study by Călburean et al. (2024). Automating these assays on the Dynex DS2 platform ensures increased throughput, precision, and reproducibility, which is critical for large-scale biomarker analysis in clinical settings.

## Automation Overview

The Dynex DS2 is a fully automated ELISA processor that can handle up to two 96-well plates simultaneously. This platform automates key steps in ELISA assays, including sample addition, reagent pipetting, incubation, washing, and detection.

For the MR-proANP and MR-proADM ELISA kits, automation on the Dynex DS2 ensures high precision, reduces manual handling errors, and allows for the efficient processing of multiple samples at once.

## Materials and Methods

### Instruments:

- Dynex DS2 Automated ELISA system (Dynex Technologies, Chantilly, VA)
- Assay Genie MR-proANP ELISA Kit (Product Code: HUF103058)
- Assay Genie MR-proADM ELISA Kit (Product Code: HUES03440)

### Reagents and Samples:

Calibrators, controls, and serum samples were processed following the manufacturer's guidelines.

Serum samples from patients with varying levels of diastolic dysfunction were analyzed, similar to the patient cohort described by Călburean et al.

### Procedure:

- **Sample loading:** Samples were diluted and loaded onto the Dynex DS2 platform, where all incubation, washing, and detection steps were automated according to the respective ELISA kit protocols.
- **Detection:** Absorbance readings were taken at 450 nm for quantification of MR-proANP and MR-proADM levels.

## Results

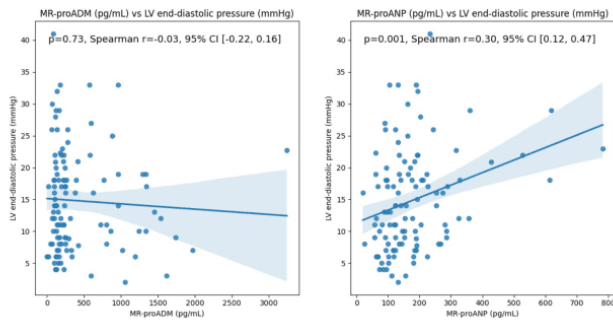


Figure 2: Correlation plot between left ventricular end-diastolic pressure and serum biomarkers.

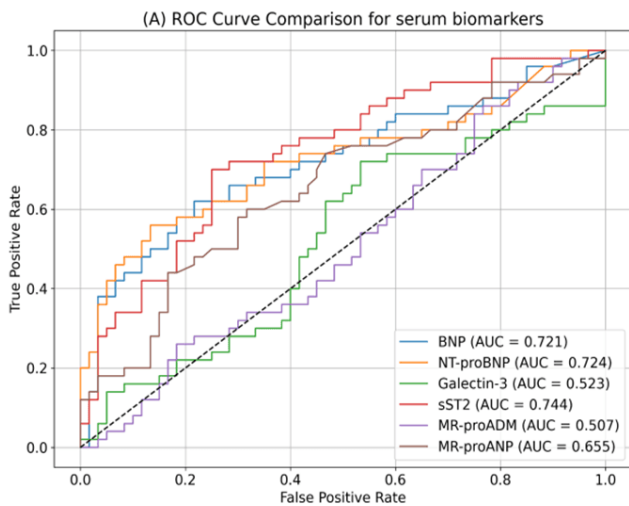


Fig. 3. Area under receiver operator curve for prediction of diastolic dysfunction.

Figure 3: Area under receiver operator curve for prediction of diastolic dysfunction. (A) ROC Curve Comparison for serum biomarkers.

Data from Călborean et al. (2024) in Figures 2 and 3 demonstrate the strong correlation between MR-proANP levels and elevated LVEDP in patients with diastolic dysfunction. Specifically, MR-proANP had a significant correlation ( $p = 0.001$ ,  $r = 0.30$ ), as shown in Figure 2, while it also exhibited strong predictive power for diastolic dysfunction, with an area under the receiver operating characteristic curve (AUC) of 0.655 ( $p = 0.003$ ) in Figure 3A.

Similarly, MR-proADM was evaluated but did not show a significant correlation with LVEDP ( $p = 0.73$ ), as illustrated in Figure 2. These findings underline the utility of the MR-proANP assay in predicting left ventricular filling pressures, while MR-proADM may serve other diagnostic purposes beyond diastolic dysfunction.

The automation of these assays on the Dynex DS2 yielded highly reproducible and precise results, with a coefficient of variation (CV) below 10%, consistent with the linearity and sensitivity demonstrated in the study by Călborean et al. This precision ensures that even subtle variations in biomarker levels can be reliably detected across multiple patient samples.

## Discussion

Automating the MR-proANP and MR-proADM ELISA kits using the Dynex DS2 platform offers numerous advantages:

- **Increased Efficiency:** High throughput is essential when analyzing large clinical sample sets, particularly in longitudinal studies like that of Călborean et al.
- **Improved Reproducibility:** The automation minimizes variability, ensuring consistent performance across multiple runs.
- **Time Saving:** The DS2 system significantly reduces hands-on time for researchers, allowing for other tasks to be carried out in parallel without compromising the quality of assay results.

## Conclusion

The study by Călborean et al. (2024) highlights the diagnostic value of MR-proANP in assessing diastolic dysfunction, particularly in predicting elevated LVEDP, and supports the integration of these assays in automated workflows.

Automation of Assay Genie's MR-proANP and MR-proADM ELISA kits on the Dynex DS2 platform ensures high accuracy, reproducibility, and throughput, making it an ideal solution for research and clinical laboratories aiming to quantify these critical cardiovascular biomarkers.

## References

1. Călborean, P.A., Lupu, S., Huțanu, A. et al. Natriuretic peptides and soluble ST2 improve echocardiographic diagnosis of elevated left ventricular filling pressures. *Sci Rep* 14, 22171 (2024). <https://doi.org/10.1038/s41598-024-73349-0>



**Find out more at:**

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