

# Supplementary Materials for RPEP-based Laboratory Automation Platform

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This repository contains supplementary materials for the research article describing the RPEP-based laboratory automation platform. The files include video recordings of key experimental workflows and corresponding RPEP instruction tables in Excel format. These resources are provided to assist with experiment replication, result verification, and further research.

## Quick Access

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- **Try the RPEP Assistant online:**  
<https://chatgpt.com/g/g-6762c202dca481919464ff7d91e6142f-rpep-assistant>

## File List

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### Experimental Videos

- **S1\_RPEP\_OPEN\_LID.mp4**  
Demonstrates the automated opening and closing of reagent bottle caps using the RPEP platform.
- **S2\_RPEP\_LIQUID.mp4**  
Shows the liquid handling workflow, including pipette tip loading, aspiration, dispensing, and tip disposal.
- **S3\_RPEP\_96WELL\_LID.mp4**  
Illustrates the process of removing and replacing a 96-well plate lid with the two-finger gripper.
- **S4\_RPEP\_CCK8.mp4**  
Presents the integrated workflow for the CCK-8 cell viability assay, covering multiple robotic operations.

### RPEP Instruction Tables

- **S5\_RPEPExpOpenLid.xlsx**  
RPEP instruction table for the bottle cap opening/closing experiment.
- **S6\_RPEPExpLiquid.xlsx**  
RPEP instructions for the automated liquid handling experiment.
- **S7\_RPEPExpOpen96WellLid.xlsx**  
RPEP instructions for the 96-well plate lid handling workflow.
- **S8\_RPEPExpCCK8.xlsx**  
RPEP instruction table for the CCK-8 cell viability assay.
- **S9\_RPEPGPTsData.xlsx**  
RPEP command tables generated by the GPT-based natural language interface during evaluation.

### RPEP System Configuration Files

- **S10\_RPEPManual.md**

Knowledge base file for the RPEP Assistant.

- **S11\_ActionsSchema.json**

Defines the OpenAPI schema for backend validation and execution interfaces called by the RPEP Assistant.

- **S12\_RPEPPosition.ini**

Contains predefined position coordinates and labels.