

# Fast, Flexible Platform for Handheld Microfluidic Cell Assays

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## Technology description

Identifying pathways involved in human diseases is the first step in the discovery of targets for therapy and diagnostics. Cell-based assays conducted *in vitro* are powerful tools in this process. Reconfiguring different types of assays and their various cells, however, often presents a technical challenge and requires a high outlay of materials and researcher labor.

Significant need remains for a convenient, economical solution that places more efficient tools in a greater number of hands by maintaining device simplicity both in operation and manufacturing. UW–Madison researchers have developed a new microfluidic device design, KOALA, which can perform assays in five-minute steps without reagent waste or time-consuming preparation.

The chip comprises a disengaging lid and base. The lid is networked by channels with protruding inputs while the base features multiple fluid wells and an absorbent pad. When the two components are pressed together, fluid from the wells is drawn into the channel by the pad's capillary action.

Additional functionalities, like creating gradients with a diffusing source, also are achievable given the design's passive fluid contact at the channel extremities. Packaged with the reagents and cells required of the assay and enabling encapsulation and freezing, KOALA is an eminently accessible and flexible assay tool.

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a rapid and economical prepackaged kit-on-a-lid (KOALA) chip integrating the reagents required for any *in vitro* cell-based assay.

## Application area

Virtually any *in vitro* cell-based assay

## Advantages

Simple to operate and manufacture

No external components or membranes

Prepackaged reagents conserve time and limit waste.

Connected channels make assay scalable without manual pipetting.

## Institution

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