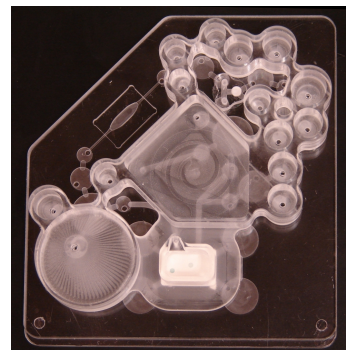


# CARD™ Technology

*“Microfluidics Comes To Life”*

## CARD™ Technology

The Chemistry And Reagent Device (CARD™) is a unique microfluidic system, produced using inexpensive plastic, that can perform automatically virtually any manual bench-top laboratory manipulation in an area about one-half the size of a standard business card. Its distinctive design and architecture allows all necessary pumps, valves, reaction chambers, and microfluidic channels to be housed within the disposable device. Once inserted into the portable CARD™ Controller, all fluidic flow and reaction conditions can be easily controlled and monitored by the self-contained software.



## CARD™ Applications

The versatility of the CARD™ technology permits the performance of a broad spectrum of biological assays. Due to its ability to precisely control and monitor all assay parameters at any step along the way (e.g., temperature, mixing, flow rates, and volumes, etc.), the CARD™ can be programmed to run immunologic or molecular assays. Since the CARD™ also has an integrated onboard thermocycler, PCR®-based assays can be performed effortlessly. In addition, isothermal molecular assays such as NASBA® (Nucleic Acid Sequence Based Amplification) also can be performed easily. Finally, onboard detection capabilities permit the assay results to be obtained directly from the CARD™.

## Sample In – Results Out

All required steps of biological assays can be performed on the CARD™. For molecular assays, the CARD™ can be programmed to automatically perform cell lysis (including bacteria and viral targets), isolation and purification of DNA or RNA, amplification of target sequences, and detection. For immunologic assays, the CARD™ can also be programmed to perform all required manipulations automatically. A wide spectrum of raw samples have been applied directly to the CARD™ and subjected to either molecular or immunologic analysis. To date, such samples have included whole blood, serum, plasma, saliva, and vaginal swabs. Non-clinical specimens have included food and water matrices as well as bacterial and mammalian cell culture samples.

## In Vitro Diagnostic Applications

The Rheonix CARD™ has direct applications in many diverse fields including, but not limited to:

- Human/Veterinary diagnostics
- Personalized medicine (SNP analysis has been demonstrated)
- Viral load determinations
- Food/Water testing
- Molecular/Immunologic assays in the research laboratory
- Homeland Security/Defense
- Process control to monitor manufacturing efforts or final products for microbial contamination

## **CARD™ Advantages**

Our engineering efforts have resulted in a number of distinct commercial advantages. Because we have designed all of the required assay functions onto the CARD™, individuals of varying skill level can replicate assays ranging from simple to extremely sophisticated. Therefore, either at the point-of-use or point-of-care, assays can be performed confidently and inexpensively with a minimal amount of training, thereby reducing labor and material costs. Furthermore, the low cost of manufacturing in a plastic format results in extremely competitive pricing to help our partners achieve commercial success.

## **Current Federal Funding**

The power and versatility of the Rheonix CARD™ technology has been validated by significant federal funding:

- US EPA – Development of a CARD™ assay to monitor drinking water for *Cryptosporidium parvum*.
- NSF – Development of a CARD™ assay to monitor recreational water for microbial contamination.
- NIAID/NIH - Development of rapid molecular test for *Mycobacterium tuberculosis*.
- NIAID/NIH – POC partnership to develop a multi-analyte test for sexually-transmitted diseases.

## **Manufacturing Capabilities**

Having spun out of Kionix, Inc., a global leader in the design and manufacture of high-performance, silicon micromachined MEMS inertial sensors, Rheonix benefits from Kionix's considerable intellectual property and expertise. The same dedication to cost-effective manufacturing that propelled Kionix into its market leading position is mirrored by Rheonix as we have thoughtfully designed our CARD™ platform to achieve competitive manufacturing costs.

## **The Rheonix Advantage**

We are presently seeking to expand the scope of our commercialization efforts by forming strategic relationships with corporations in fields of use that are of interest to us. Given the extreme rapidity with which we can prototype a CARD™ to achieve desired results, the most suitable partner for us is one that (a) already has a presence in the fields of use noted above and (b) already has bench-top assays that it seeks to migrate to a fully-automated platform. Our engineering and prototyping capabilities allow us to quickly transform such assays onto the CARD™ platform in a cost-efficient manner.

## **Contact Information**

To learn more about our CARD™ technology platform, please visit our website at [www.rheonix.com](http://www.rheonix.com). For business development inquiries, please contact our Western New York offices:

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