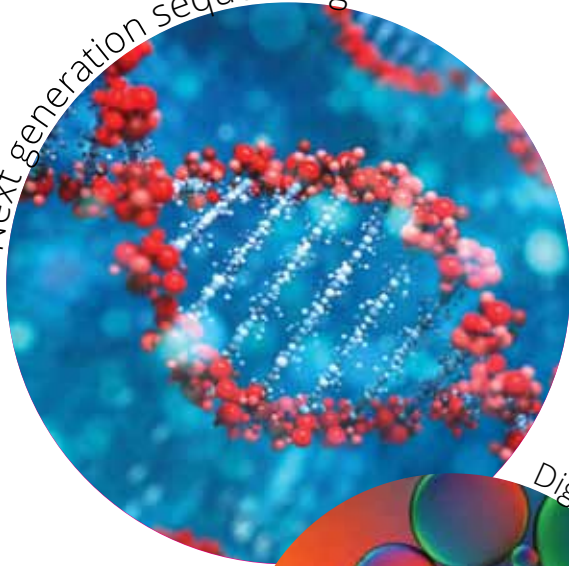


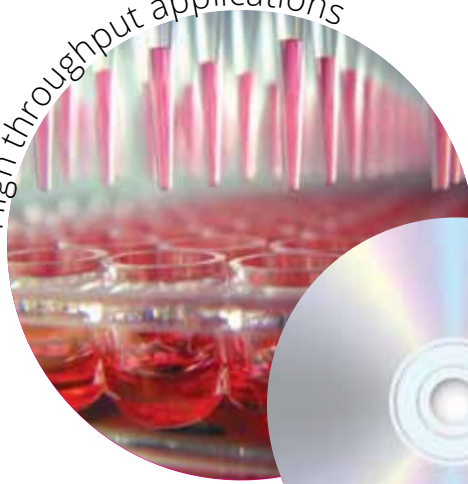
RPA

The versatile PCR replacement

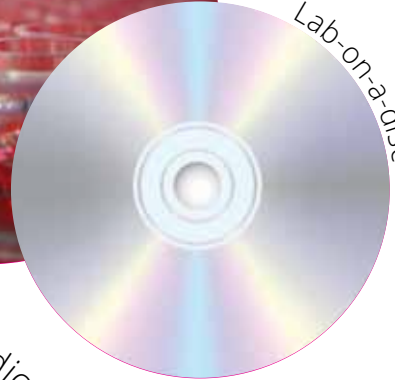
Next generation sequencing



High throughput applications



Lab-on-a-disc



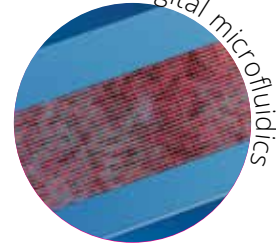
Digital RPA



Microfluidics



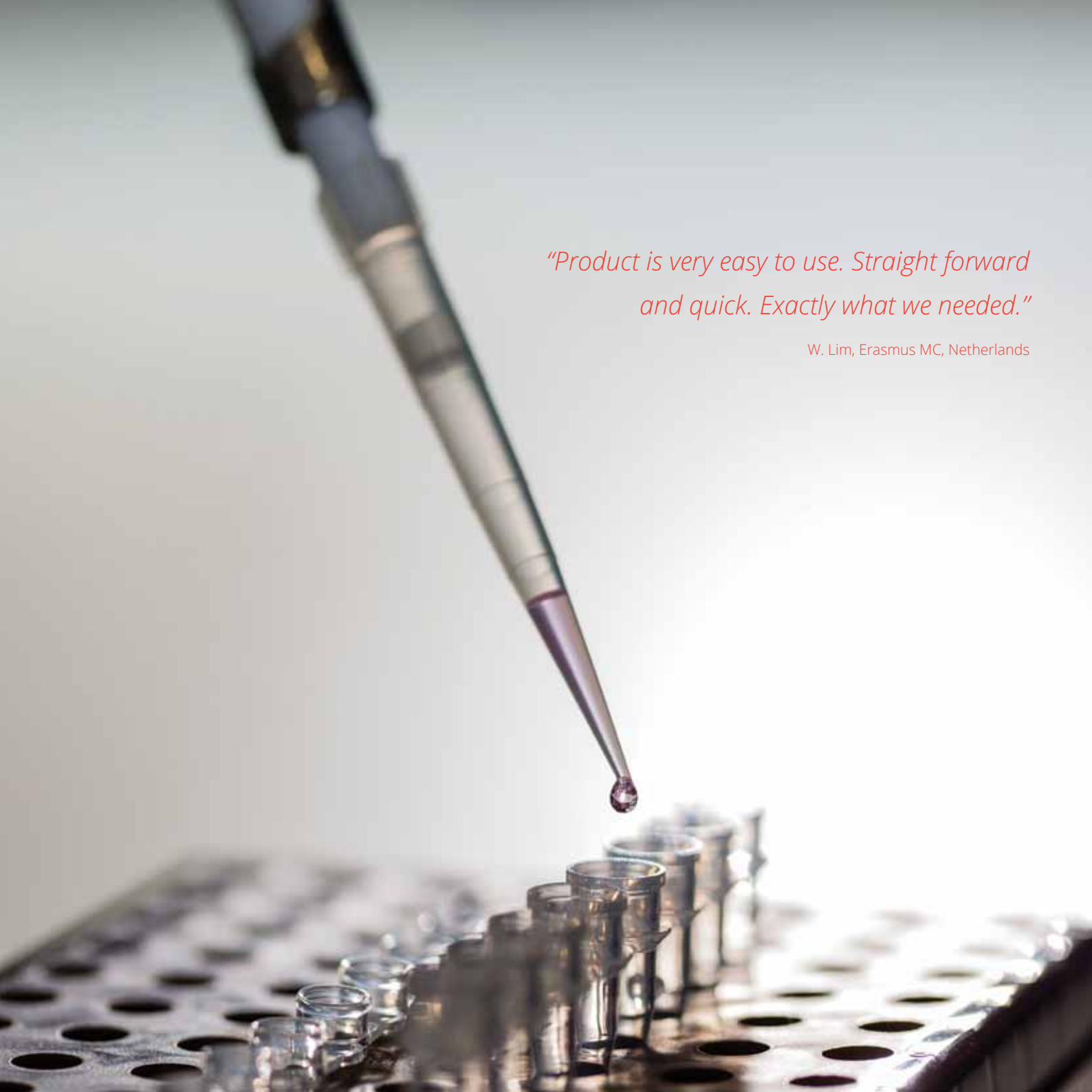
Digital microfluidics



Product information

TwistDx™

Unwind DNA's possibilities



*"Product is very easy to use. Straight forward
and quick. Exactly what we needed."*

W. Lim, Erasmus MC, Netherlands

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What is RPA?

Imagine a world where you only had to wait 10 minutes to amplify the DNA or RNA you need.

Or being able to easily carry your DNA amplification assays out in the field, in a suitcase, to places where medical needs are greatest.

Today, fast, lightweight, multiplexable, PCR-like sensitivity without the need of a thermocycler is available to you.

Recombinase Polymerase Amplification (RPA) employs enzymes which are capable of pairing oligonucleotide primers with homologous sequence in duplex DNA.

After that it's much like PCR but with no thermocycling required. The reaction progresses rapidly and detectable levels are reached typically within 3-10 minutes.

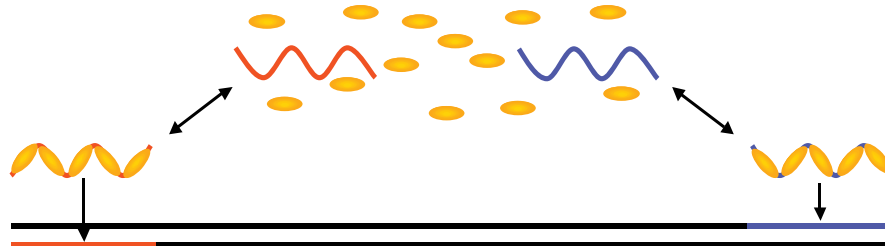
“Perfect for rapid detection of RNA viruses under harsh conditions.”

Dr A. A. El Wahed, University of Göttingen, Germany

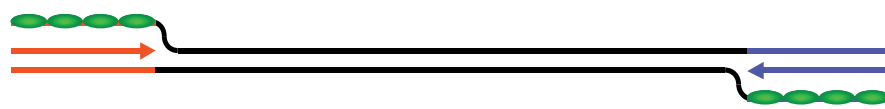


The RPA cycle

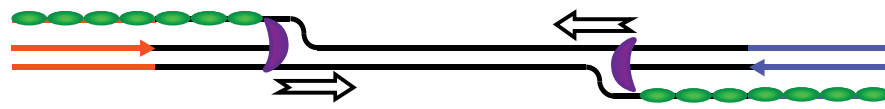
1. Recombinase / oligonucleotide primer complexes form and target homologous DNA.



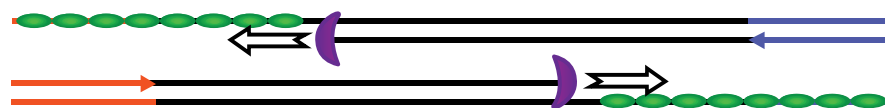
2. SSB protein binds to displaced strand, stabilising the resulting D-loop.



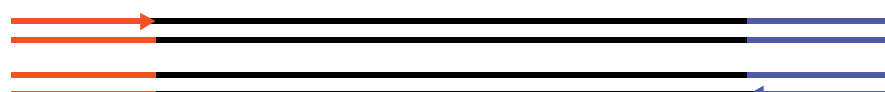
3. A strand displacing polymerase initiates synthesis.



4. Parental strands separate and synthesis continues.




5. Two duplexes form.

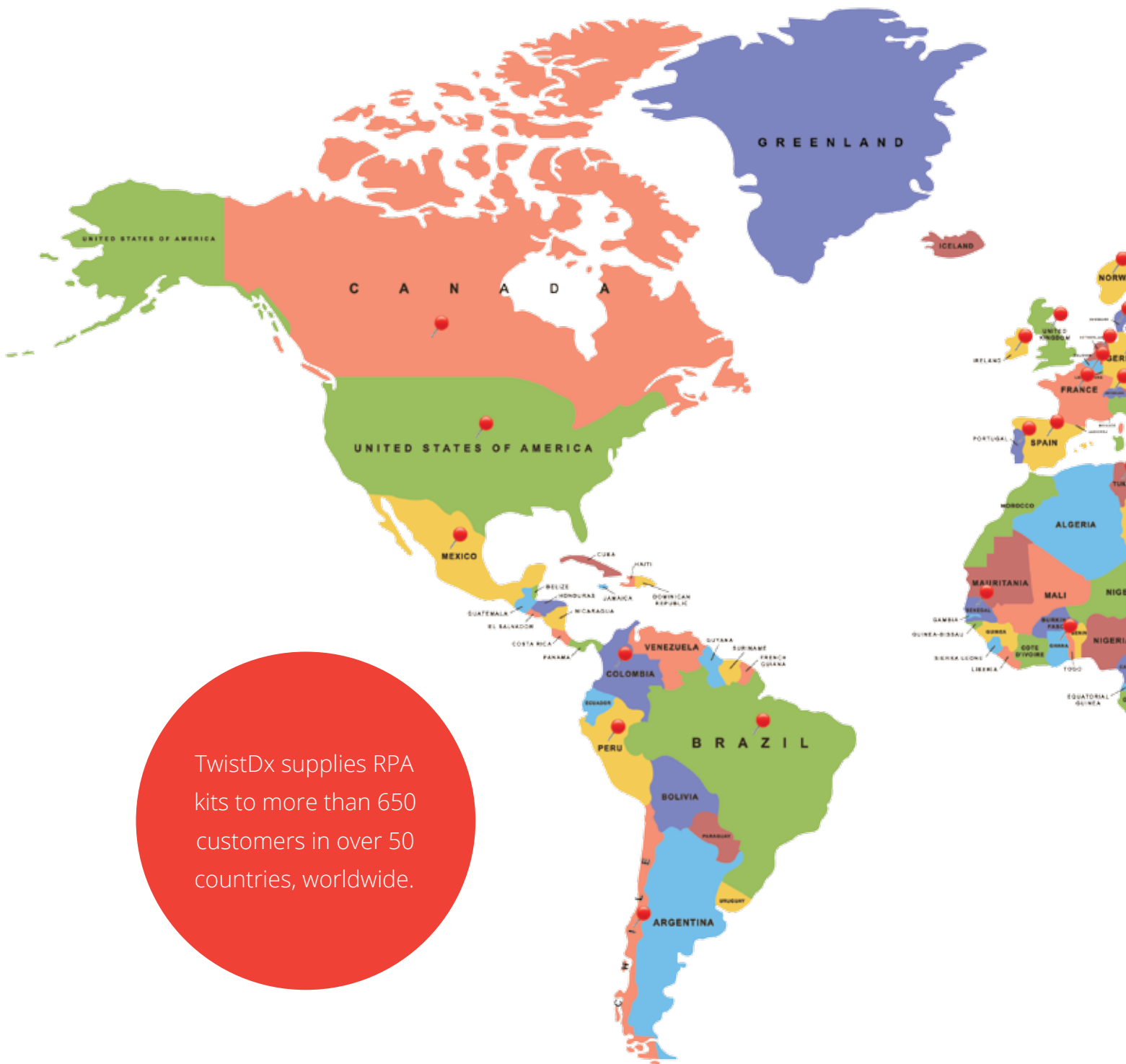


 Oligonucleotide primers

 Recombinase

 Single-stranded DNA binding (SSB) protein

 Polymerase



TwistDx supplies RPA kits to more than 650 customers in over 50 countries, worldwide.



Why RPA?

- **Versatile** - Diverse applications.
- **Speed** - Detection in minutes.
- **Simple design** - Single primer pair.
- **No thermocycler** - Low temperature incubation (37-42 °C).
- **Simple workflow** - Minimal sample prep, hardware compatibility
- **Sensitive and specific** - Single molecule detection, proprietary probe systems.
- **Multiplex compatible** - Run duplex, triplex and IC assays.
- **One step RT addition** - RNA and DNA detection.
- **Multiple detection formats** - Fluorescence, lateral flow and gel.
- **Flexible format** - Volumes, tubes, custom reactions.

Get RPA inspired

If RPA sounds like a good idea to you but you are still unsure of how you can use it, get some inspirational ideas from those that already have. With **over 250 publications** written so far, you'll be spoilt for choice.

Log on to twistdx.co.uk/publications to find out more.

RPA versatility

Microfluidics

Digital

Nesting

Solid phase

Template generation

SNP detection

RPA applications

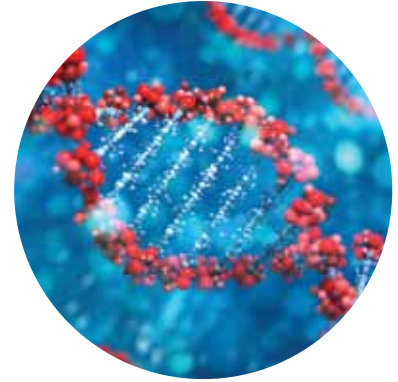
TwistDx™ TwistAmp® research kits provide ideal tools for researchers to develop tests, assays and kits relevant to their work in fields as diverse as water testing and biodefense, or food species verification and clinical or veterinary diagnostics. TwistDx™ can work with partners on specific assay development collaborations for research and commercial applications.



Medical diagnostics



Water and food safety



Species identification



Veterinary



Biodefence



Agriculture

How does RPA compare?*

Technique	Typical incubation temp (°C)	Incubation time (mins)	Application versatility inc. scientific article 'proof of principle'	Multiplex
Recombinase Polymerase Amplification (RPA)	20-45	<10	Real-time fluorescence, lateral flow, gel, NGS, SNP, dRPA, microarray, nesting, echem, solid-phase, microfluidics, naked eye	Yes, including unbalanced titre targets
Polymerase chain reaction (PCR)	Thermocycling	20-180	Real-time fluorescence, lateral flow, gel, NGS, SNP, dPCR, microarray, nesting, echem, solid-phase, microfluidics, naked eye	Yes
Loop-mediated isothermal amplification (LAMP)	60-65	<60	Real-time fluorescence, lateral flow, gel, turbidity, microfluidics, naked eye	High complexity (multiple primers per assay)

*Data collated at time of print.



"I am able to achieve amplification in a much shorter time as compared to conventional PCR."

J. H. Soh, Institute of Bioengineering and Nanotechnology, Singapore

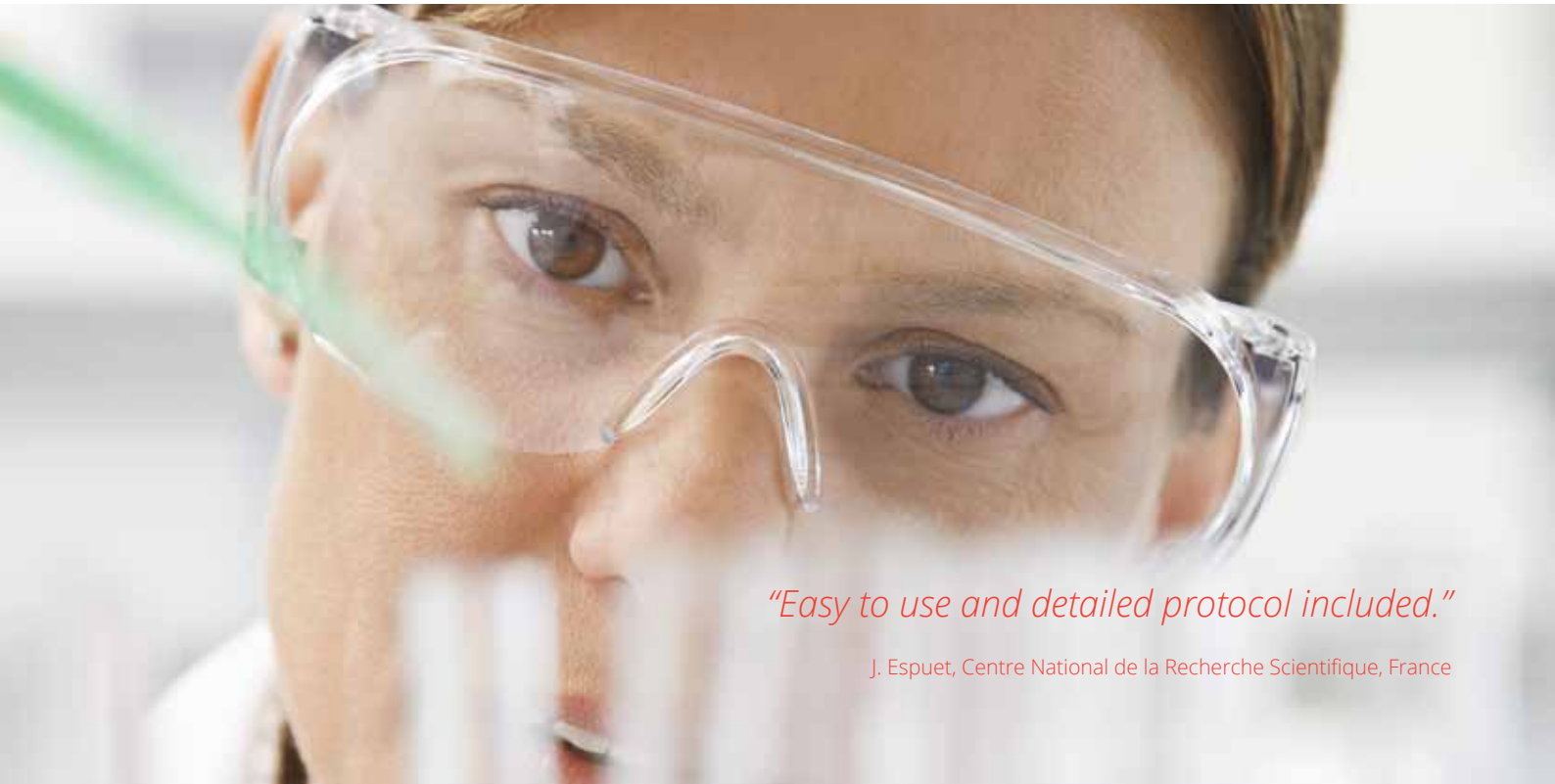
Research and development kits

TwistAmp® research kits contain all the reagents necessary to amplify nucleic acids using specific primers designed by the end user. Enabling users to develop their own rapid, highly sensitive and specific RPA assays. TwistAmp® kits facilitate the development of fast, specific and sensitive DNA and RNA detection for numerous applications and uses.

Formulated specifically to exhibit the following overall performance characteristics:

- fast amplification (5-10 minutes in most cases)
- amplicon length of under 500bp
- optimal temperature of 37°C - 42°C

TwistAmp® kits are available in freeze-dried (lyophilised) and liquid formats to help match your needs.



"Easy to use and detailed protocol included."

J. Espuet, Centre National de la Recherche Scientifique, France

TwistAmp[®] Liquid kits

Liquid kits offer the following benefits:

- end user is free to modulate of the amount of master mix prepared by being unlocked from the set volumes in which freeze-dried reagents are supplied
- end-user is free to modulate the ratios of components in the reaction system which offers them greater flexibility in RPA assay development



TwistAmp[®] Liquid aims to supply bulk liquid forms of core RPA components which end-users may combine at various scales to create master mixes for their own applications.


TwistAmp[®] Lyophilised kits

TwistAmp[®] kits containing freeze-dried reactions, offer the following benefits:

- dry-formulated RPA reagents are stable enough to be transported at ambient temperatures
- a multitude of field-friendly detection outputs are enabled inc. lateral flow and fluorescence
- sample tolerance and robustness of RPA to some complex sample types make it suited to a wide range of field-based and point-of-care applications



TwistAmp[®] lyophilised (freeze-dried) kits are conveniently provided in a format ideally suited to taking out in the field, point-of-care and other settings with minimal resources.



"This kit is very popular with our scientists, and provides easy and effective testing of our samples."

C. Fitzgerald-Cook, Two Pore Guys, USA

Basic nucleic acid amplification kits

TwistAmp® Basic / Liquid Basic

Contains all the enzymes necessary for DNA amplification. Available in lyophilised and liquid formats.

TwistAmp® Basic RT / Liquid Basic RT

Contains all the enzymes necessary for RNA amplification. Includes a reverse transcriptase to permit single-step RNA detection. Available in lyophilised and liquid formats.

Basic kits are perfect for • end-point DNA gel electrophoresis detection, use for downstream processing, or solid-phase, tailed primers, aptamers, electrochemistry and microarray applications.

Probe-based nucleic acid amplification kits

Designed to be used with TwistDx™ proprietary probe systems.

TwistAmp® exo / Liquid exo

Contains all the enzymes necessary for DNA amplification, in conjunction with exo probes. Available in lyophilised and liquid formats.



TwistAmp® exo RT / Liquid exo RT

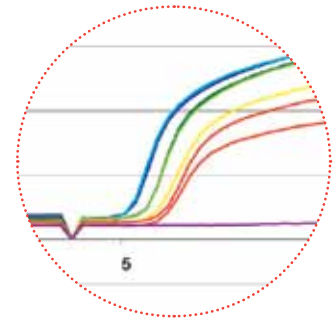
Contains all the enzymes necessary for RNA amplification in conjunction with exo probes. Includes a reverse transcriptase to permit single-step RNA detection. Available in lyophilised and liquid formats.

Perfect for • rapid real-time fluorescent DNA detection.

TwistAmp® fpg

Tailored for users who want to combine RPA technology with an alternative fpg probe system. Available in lyophilised format.

Perfect for • real-time fluorescent DNA detection, end-point analysis.



TwistAmp® nfo

Contains all the enzymes necessary for DNA amplification, in conjunction with nfo probes. Available in lyophilised format.

TwistAmp® nfo RT

Contains all the enzymes necessary for RNA amplification, in conjunction with nfo probes. Includes a reverse transcriptase to permit single-step RNA detection. Available in lyophilised format.

Perfect for • end-point analysis including lateral flow DNA detection.

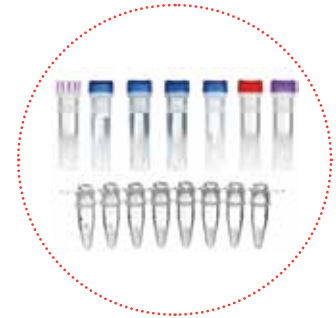


Test-ready kits

Great for RPA method development or trialling RPA technology without the need to develop an assay of your own. Presented at different development stages, these test-ready kits showcase example RPA reagent formats and versatility with assays for prominent food pathogen targets.*

TwistAmp® exo +Campylobacter/+Listeria

Provides the user with an exo kit plus assay oligonucleotides and template ready for real-time fluorescence detection for use with every kit reaction. 96 reactions.



TwistGlow® Salmonella

Test-ready for real-time fluorescence detection. Provides user with reactions containing target and internal control assay oligonucleotides, a two-step lysis sample preparation method, and template ready for use with every kit reaction. 96 reactions.



TwistFlow® Salmonella

Test-ready for end-point lateral flow detection. Provides the user with reactions containing target and internal control assay oligonucleotides, a two-step lysis sample preparation method, and template ready for use with every kit reaction. 24 reactions.



* All the kits are for research and development use as per our terms and conditions of supply

Devices and accessories

Currently intended for R&D use only, with options for taking your RPA assay beyond the laboratory, the following incubation and detection solutions are open to you:

T16 Isothermal Device

Suitable for field-based and POC diagnostic applications, the T16-ISO operates at a constant temperature that enables DNA/RNA amplification in a compact, low-cost, stand-alone, sensitive instrument. Combine with micro balls for automatic mixing of up to 16 reactions. Provides simultaneous measurement of FAM™, HEX™, and ROX™, or other fluorophores with similar spectra.



T8 Isothermal Device

Provides next generation molecular testing in a compact, stand-alone, high sensitivity instrument suitable for both laboratory and field-based applications. The T8-ISO is a portable 8-tube instrument that provides reaction incubation and measurement of two fluorophores: FAM™ and ROX™, or other fluorophores with similar spectra.



Twirla™

Twirla™ is a portable 6-tube mixing incubator that prepares RPA reactions for end-point measurement. Twirla™ is small, lightweight, and is mains or AA battery operated, making it the perfect solution for field-use RPA.



Lateral flow consumables

A range of lateral flow dipsticks are available from our website: twistdx.co.uk/products



*"Easy to use, well documented,
great support."*

Greg Swanson, Nova-Tech Engineering, USA

Custom reactions and commercial access

Provides customers with a mechanism to source bespoke RPA reactions configured to meet their own specific requirements, which can lead to product development by obtaining commercial access:

- reactions containing bespoke primers and probes
- variation in concentration of proteins or other components
- flexible reaction volumes and containment
- internal control DNA or RNA species inclusion
- other format adaptations

Contact our dedicated technical help team techsupport@twistdx.co.uk for a detailed quotation.

Contact us

TwistDx Limited, Building 0, Unit 9A, Coldhams Business Park, Norman Way,
Cambridge CB22 3AT, United Kingdom

T +44 (0) 1223 608608 | E info@twistdx.co.uk

twistdx.co.uk



RPA. The versatile PCR replacement.