

## Method:

The following kits were used as comparators to the PCRdirect® system:

- Promega Wizard gDNA extraction kit – Solutions based DNA extraction with step including cell lysis and protein precipitation.
- Qiagen QIAamp Mini DNA kit – column-based kit
- Zymo Research Universal DNA extraction kit – column-based kit

## Conclusion:

This case study highlights how PCRdirect® can dramatically accelerate pre-analytical sample prep without compromising the quantity and quality of genomic material.

PCRdirect® is supplied as a ready-to-use kit for application on a wide range of sample types including whole blood, plasma, urine, buccal swabs, bacteria and parasites. The DNA released is immediately suitable for downstream molecular investigations.

## CASE STUDY:

# A comparison of PCRdirect® Ultra-Fast Sample Prep with 3 commercial DNA extraction kits



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**Rapid DNA extraction for bacterial cultures of Pseudomonas aeruginosa and sputum samples from patients with cystic fibrosis.**

**For this case study, a panel of 10 clinical isolates were selected (Table 1) which form part of an international panel of P. aeruginosa isolates. (De Soyza et al., 2013).**



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PCRdirect® is manufactured by Arcis Biotechnology, an ISO13485 registered company.

## Summary:

The PCRdirect kit was compared with three commercially available DNA extraction kits. This study shows that PCRdirect compares favourably with existing DNA extraction solutions, and offers unparalleled benefits in terms of turn-around time and simplicity.

**This independent evaluation was carried out by Dr. J. Fothergill and Y. Hilliam, Institute of Infection and Global Health, University of Liverpool**

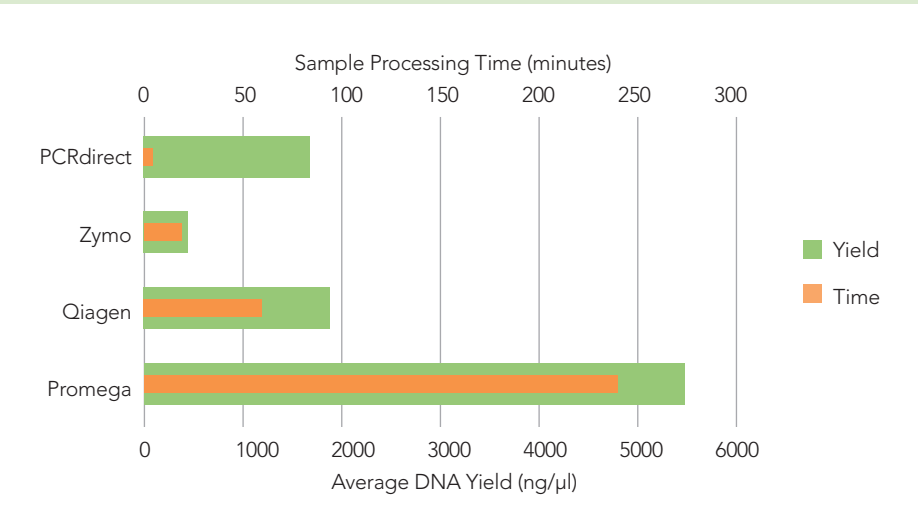
# Results:



## Results: Sample Prep Time

The comparator kits all require instrumentation such as centrifugation and heating, the processing times range from 20 minutes to 4 hours. The PCRdirect® kit requires no instrumentation and takes three minutes from start to finish (Figure 1).

Figure 1: DNA yield Vs Sample Processing Time



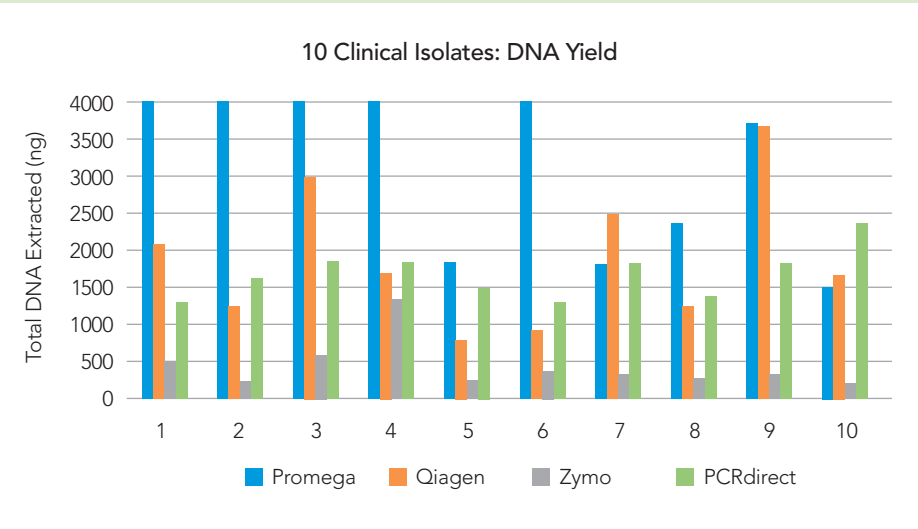
## Results: DNA Yield

The total DNA extracted from each kit was assessed using the Qubit System (Table 1). Promega kit yielded the most DNA however results were found to be highly variable. Large amounts of DNA was extracted from some of the isolates but this was not consistent. This is also the most labour intensive and time consuming kit. The ARCIS kit was comparable to the Qiagen kit but DNA is obtained in 3 minutes compared to 60 minutes for the Qiagen system (Figure 2).

Table 1: DNA yield for the panel of bacterial clinical isolates as measured by Qubit system

Isolate	Total DNA extracted (ng)			
	Promega	Qiagen	Zymo	PCRdirect
1	13200	2097	485	1308
2	6760	1253	240	1625
3	5243	3003	605	1866
4	9400	1713	1350	1841
5	1840	805	255	1500
6	8897	930	385	1317
7	1823	2490	340	1825
8	2370	1250	280	1387
9	3727	3690	340	1825
10	1517	1680	220	2374

Figure 2: DNA yield for the panel of bacterial clinical isolates as measured by Qubit system

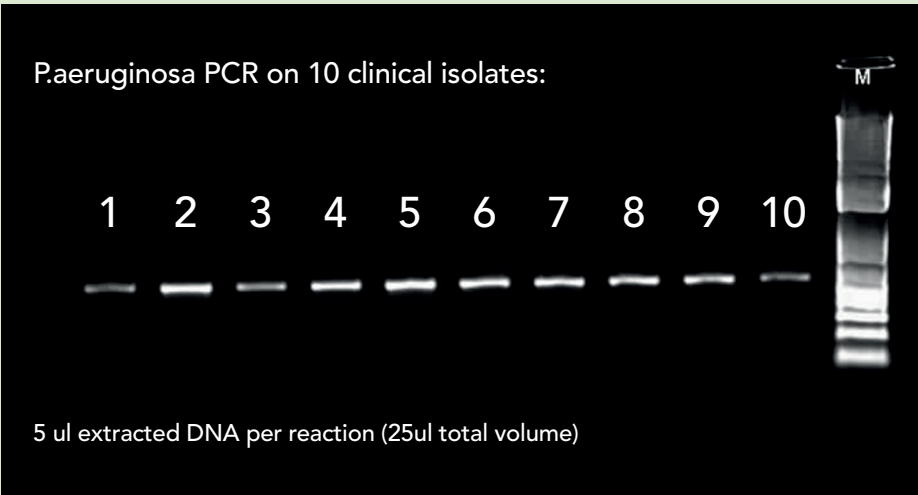


\*Isolates 1,2,3,4,6 cropped for illustration (see Table 1 for total yield)

## Results: PCR on clinical isolates

PCR was used to verify that the DNA obtained was amplifiable and of sufficient quality for molecular investigations. The DNA gave a single band of the correct size following end point PCR (Figure 3).

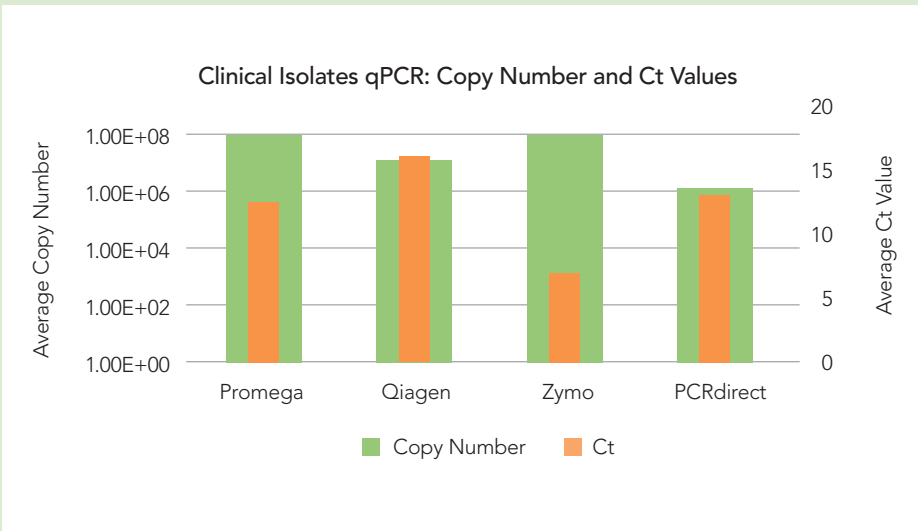
Figure 3: PCR results from samples processed using the PCRdirect® Kit



## Results: qPCR on clinical isolates

qPCR was used to verify that the DNA was suitable for use in real-time quantitative PCR with sybr green. Ct values and copy number assessments are shown in Figure 4. The PCRdirect® system was shown to be comparable in performance with the other commercial kits.

Figure 4: qPCR results for the PCRdirect kit and comparator systems (clinical isolates)



## Results: qPCR on challenging samples

The PCRdirect kit was challenged with a traditionally difficult sample matrix: a panel of 10 sputum samples from cystic fibrosis patients. In terms of copy number and Ct values the PCRdirect® kit performed as well as the 3 comparator systems (Figure 5).

Figure 5: qPCR results for the PCRdirect kit and comparator systems (sputum samples)

