Teaser Memorandum

BioQuest Co., Ltd.

December 2007

KHIDI

Executive Summary

Established in Jul. 29, 2002, BioQuest Co., Ltd ("BioQuest" or "the Company"), a bio technology venture company which develops and manufactrers amplification reagents and clinical diagnosis. BioQuest's major technology is PCR-related thermostable enzymes purification and Direct PCR technology. And R & D focus on Direct RT-PCR, Direct real time PCR and Molecualr diagnostic markers in pharmacogenetic and oncology.

AnyDirect™ that the company recently introduced to market is a promising buffer system improving PCR amplification without DNA isolation. Specifically, AnyDirect™ allows Direct PCR from all types of anticoagulant-treated bloods, plasma etc without any DNA purification steps. Moreover, AnyDirect PCR can be used for Direct PCR of various samples, such as tissues, body fluids, bacteria, viruses and so on. Futhermore, according to experiment design, sample itself, crude lysate, or (partially) purified DNA can be used as template for Direct PCR. In Paticular, sample itself as template give naturally occurring "hot start PCR" effect without manual hot start method or hot start PCR enzyme.

BioQuest intends to enter into a technology transfer or licensing transaction with respect to AnyDirect™ ('the Transaction'). Terms of the Transaction are not set, and interested parties may futher discuss the parameters should they wish to enter into an agreement.

Key Technology Highlights

□ Inexpensive and Non-hazardous Process

To isolate or purify nucleic acid molecules from biological specimens, phenol-chloroform extraction, ion-exchange chromatography or glass bead-using method are usally employed. However, these purification methods considered to be tedious are a time- and cost- consuming process. Futhermore, phenol is well known to be very toxic to human and environment.

Accordingly, AnyDirect™ PCR is a inexpensive and non-hazardous process due to being directly applied biological specimens to nucleic acid-involving enzymatic reactions.

□ Simple, Convenient, and Rapid Technology

Mercier et al. have reported the PCR processes directly from whole blood without any purification. However, this process has some shortcomings in that blood PCR reactions are required initial three times heating-cooling steps. And FoLT-PCR method is treated whole blood with formamide and the mixture undergoes pre-reaction.

In addition, Burckhrdt discloses that varing the conc. of cations in PCR reactions allows for the Direct PCR using up to 80 %(v/v) blood sample. However, this process includes that blood samples are pre-heated prior to amplification reactions.

However, AnyDirect solution does not need any pretreatment for amplification from whole blood.

□ Application of various DNA polymerase to PCR amplification

Nishimura et al. have proposed that PCR reactions at pH range higher than 8.9 could considerably overcome the inhibition effect of blood to PCR (U.S. Patent No. 5,935,825). However, since this approach adopts higher pH, chemically modified DNA polymerase for hot start PCR such as AmpliTaq Gold DNA polymerase (Applied Biosystems, Inc.), FastStart Taq DNA polymerase (Roche Applied Science, Inc.) and HotStarTaq DNA polymerase (Qiagen, Inc.) do not work their conditions, and various DNA polymerases are not applied to their PCR amplification.

In contrast, AnyDirect solution is working at pH 8.2.

Company Description

- CEO: Jong Yeol KIM
- Established: Jul. 29, 2002
- Business Area: Amplification Reagents and Clinical Diagnosis

Patent Registration:

- Patent Title: Method for performing direct enzymatic reactions involving nucleic acid molecules
- Registered Country: Korea
- Regional Phase: US, EP, JP, CN
- Earliest Expiration Date: Mar. 2026
- Patent Title: Chemical-modified thermostable DNA polymerase
- Registered Country: Korea
- Expiration Date: May. 2024

Company History

2002.7	Company established
2002.8	Launched Taq DNA polymerase and Taq PCR MasterMix
2003.1	Launched Pfu DNA polymerase and NE-Taq DNA polymerase (for Long Range)
2003.4	Carried out Small and Medium Enterprises Technological Innovation and Development Project (Participation Company)
2004.5	Filed Domestic patent application for Hot Start PCR "Chemical-modified thermostable DNA polymerase"
2005.2	Filed Domestic patent application for Direct PCR technology "Method for performing direct enzymatic reactions involving nucleic acid molecules"
2005.6	Launched products for Direct PCR(AnyDirect PCR buffer and AnyDirectMax PCR buffer)
2006.2	Filed PCT application for Direct PCR technology "Method for performing direct enzymatic reactions involving nucleic acid molecules"(claim the right of priority)
2006.3	The entry into the U.S., EP, JP and CN Regional Phase
2006.4	Selected "New technology idea industrial evaluation project of small and medium business administration"
2006.9	Registered Patent(KR) "Chemical-modified thermostable DNA polymerase"
2006.6	Research participation in specific R&D/molecular sensing tech. project of Ministry of Science & Technology
2007.5	Selected "Small and medium enterprise technique reform reclamation a work"
2007.7	Registered Patent (KR) "Method for performing direct enzymatic reactions involving nucleic acid molecules"

Technology Overview

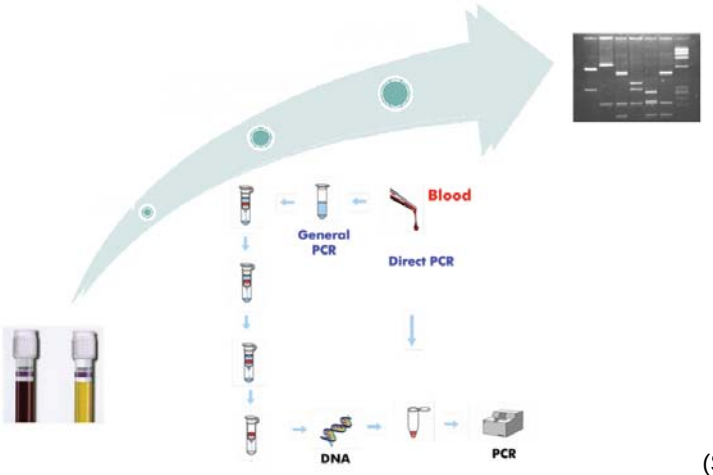
□ Technology platform

BioQuest's major technologies involve PCR-related thermostable enzymes purification and Direct PCR technology. Research & Development focus on Direct RT-PCR, Direct real time PCR and Molecular diagnostic markers in pharmacogenetic and oncology. With the technology platform, the company succeeded in developing novel PCR buffer system, AnyDirect™ that do not require DNA isolation or pretreatment.

□ AnyDiRECT™

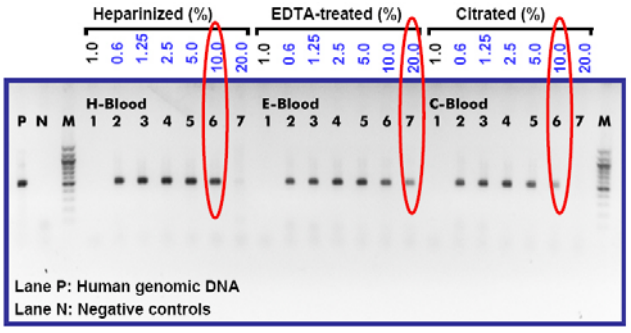
● AnyDirect™ is a buffer system that can improve PCR amplification from various biospecimens DNA isolation. Therefore, the buffer system has an advantags as following: i) time saving, ii) convenience, iii) avoidance of infection in sample handlers, iv) prevention of loss of trace samples in the DNA purification step, and v) potential automation for large-scale diagnosis.

Fig. 1. Direct Amplification vs DNA Amplification from Blood



(Source: Company)

Fig. 2. Direct PCR of p53 from various anticoagulant-treated human blood

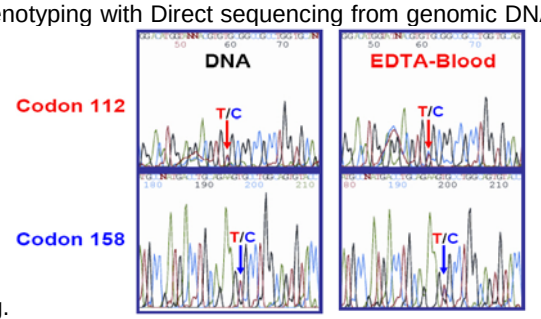


(Source: Company)

- Lane 1: treated human blood with conventional PCR buffer. - Lane 2-7: treated human blood with AnyDirect.

- The inhibitory effects caused by anticoagulants is successfully overcome and PCR result can be achieved even in the condition of maximum 10-20% (v/v) blood volume in a total reaction volume.

Fig. 3. Apolipoprotein E genotyping with Direct sequencing from genomic DNA and EDTA treated blood using BigDye Terminator v3.1 cycle sequencing.



(Source: Company)

- Direct PCR chemistry does not interfere downstream dideoxy sequencing reaction and fluorescent detection.

● Key features

▪ Save time, cost and labor due to no DNA extraction

- Direct PCR from whole blood, blood stains, blood cards, buccal swab, body fluid, bacteria, viruses and tissues without DNA extraction.

- Compatible with various sources of thermostable DNA polymerase (e.g. *Taq, Pfu, Pwo, Tth* DNA polymerase, all types of hot start DNA polymerase)

▪ Small volume of samples is required (e.g. cancer biopsy, stem cell, tissue microarray etc.)

▪ Reduce the risk of contamination and easy PCR handling and automation.

▪ Polymerase compatibility.

- All commercial recombinant and native *Taq* DNA polymerases and chemically-modified hot start *Taq* DNA polymerases

- High fidelity DNA polymerases (e.g., Pfu and Pwo), other sources (e.g., Tth DNA polymerase.), and blended long range PCR enzymes (e.g., Ex-Taq (Takara), …).

● Applications

- Point-of-care : Lab-on-a-chip technology (Bio-MENS) and Nanotechnology

- Diagnostics field : Real-time PCR, Luminex, Mass Spectrometer, Pyrosequencing, Ligase chain reaction, …

- Pharmacogenetics, - Rapid and/or High-throughput for nucleic acid testing : Blood banking and Human identifications

● Market potential

- Roche Molecular Diagnostics, Bayer Diagnostics, Vasis, Gen-Probe and Biotest Inc. etc are currently dominant players in molecular diagnostics area.

- According to the report of the Kalorama Information Inc., it was estimated that a worldwide molecular diagnostics products market was US$17.9 billion in 2006 and it will grow to $92.1 billion in 2016. Therefore, it is expected to rapidly grow an average of 41.5% per year.

- In particular, it is expected that the growth is mainly depended on drug-resistant target market and molecular diagnostics area of tumor.

- It is prospected that a diagnostic biochip market scale will be approximately $400 billion, and according to KIPO, a worldwide market will have rapidly expanded to 2010.

Patent & Thesis

Reg/Appl Number	Status	Description
0624490(Korea)	Registered	Chemical-modified thermostable DNA polymerase
0746372(Korea) PCT/KR2006/000457	Registered Filed/Regional Phase (US, EP, JP, CN)	Methods for performing direct enzymatic reactions involving nucleic acid molecules

The company also published thesis regarding Direct PCR technology in various journals as following:

▪ Young Geun Yang, Jong Yeol Kim, Young-Han Song, Doo-Sik Kim, A novel buffer system, AnyDirect, can improve polymerase chain reaction from whole blood without DNA isolation, *Clin. Chim. Acta*, (2007) 380, 112-117.

▪ Young Geun Yang, Jong Yeol Kim, Moon-Soo Soh, Doo-Sik Kim, A simple and rapid gene amplification from *Arabidopsis* leaves using AnyDirect system, *J. Biochem. Mol. Biol.*, (2007) 40, 444-447.

▪ Young Geun Yang, Man Ki Song, Su Jeong Park, Suhng Wook Kim, Direct detection of Shigella flexneri and Salmonella typhimurium in human feces by Real-Time PCR, *J. Microbiol. Biotechnol.*, (2007) 17, 1616-1621.

▪ Su Jeong Park, Jong Yeol Kim, Young Geun Yang, Seung Hwan Lee, Direct STR amplification from whole blood and blood-(or saliva-) spotted FTA without DNA purification, *J. Forensic Sc.,* (2008) in press.

Contact Point

KHIDI (the Korea Health Industry Development Institute) is currently receiving inquiries from interested parties in this transaction. If you are interested, please contact any of the KHIDI professionals below:

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