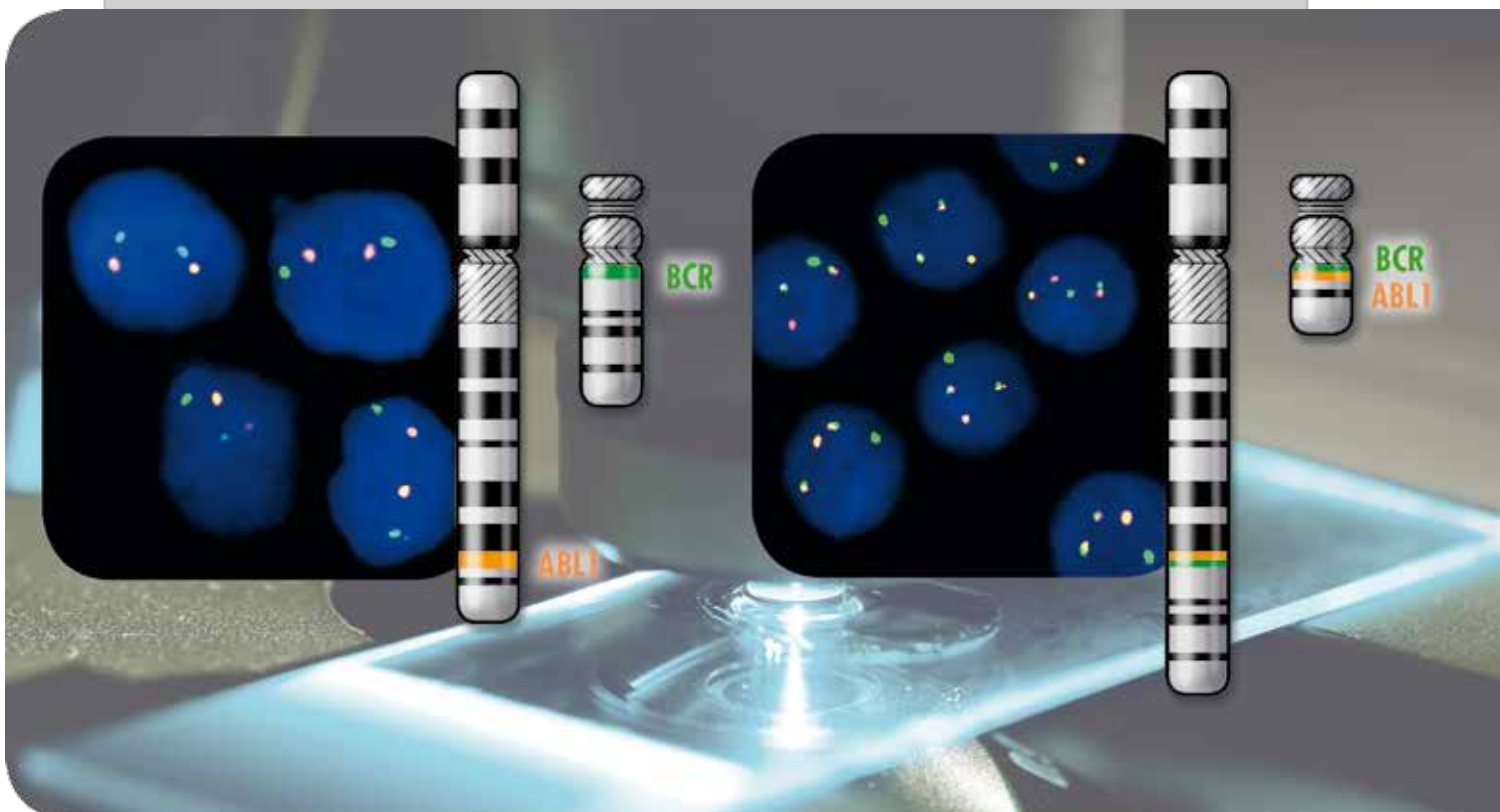


Detection of BCR/ABL1 Fusion

Comparative Analysis of Six Commercially Available FISH Fusion Probes



Knas T *et al.* (2015) *Pathologie* 36(4): 372-84.

Dear Readers,
 With this new issue of our **ZYTONNEWS** we would like to summarize the interesting publication of Knas *et al.* 2015 (available in German language only). By comparing different commercially available probes and protocols the use of the **ZytoLight® SPEC BCR/ABL1 Dual Color Dual Fusion Probe** resulted in best hybridization efficiency combined with superior signal quality!

Enjoy reading, Yours
 ZYTONNEWS
 TEAM

Aim of the Study

Chronic myeloid leukemia (CML) is diagnostically defined by the reciprocal translocation $t(9;22)(q34;q11)$. This aberration can be detected by the BCR-ABL1 fluorescence *in situ* hybridization (FISH) technique.

This article presents a comparative analysis of different commercially available FISH probes and different FISH protocols in order to optimize this technique on formalin-fixed and paraffin-embedded bone marrow trephine biopsies.

Comparative Analysis of the Following Probes

Manufacturer	Probe
ZytoVision	ZytoLight® SPEC BCR/ABL1 Dual Color Dual Fusion Probe
Cytocell DC	Aquarius® BCR/ABL Dual Color Translocation, Dual Fusion Probe
Cytocell TC	Aquarius® BCR/ABL Plus Translocation, Dual Fusion Probe
Kreatech	ON BCR/ABL $t(9;22)$, TC, D-Fusion
MetaSystems	XL BCR/ABL1 plus Translocation Dual Fusion Probe
Abbott	Vysis LSI BCR/ABL, Dual Color, Dual Fusion Translocation Probe Set

Evaluation Criteria

**Bone marrow tissue slides are evaluated for the following criteria.
100 cells were counted per slide:**

- Intensity of the signals
- Unspecific signals
- Amount of auto fluorescence
- Background ratio

- Positive: 2 fusion, 1 orange, and 1 green signal
- Negative: 2 green and 2 orange signals
- Cut-off level of analyzed tissue samples: 15%

Summary of Conclusions

- Detection of the reciprocal translocation $t(9;22)$ in formalin-fixed, paraffin embedded bone marrow trephine biopsies by fluorescence *in situ* hybridization (FISH) is possible.
- The Ulmer EDTA Protocol has proven to be the best of all tested protocols.
- In direct comparison with 5 different commercially available probes - the use of the **ZytoLight® SPEC BCR/ABL1 Dual Color Dual Fusion Probe** gave the best results.

Results

Part I – Comparison of the different FISH probes using the Ulmer Standard Protocol

17 of the 38 cases were evaluated by using all 6 commercially available FISH probes. Due to the convincing results of the ZytoVision and CytoCell probes the remaining 21 cases were evaluated by using only probes of these two manufacturers.

Improved Ulmer Standard Protocol

similar to the ZytoLight FISH Tissue Implementation Kit

- Deparaffinization using xylene and ethanol
- Pretreatment using Citrate-Buffer (10 mM, pH 6), 15 min, 98°C
- Pepsin digestion (25mg/100ml), 25 min, 37°C
- 2 µl probe-mix on marked tissue area
- Probe denaturation, 10 min, 75°C
- Hybridization o/n, 37°C
- Wash with Wash A (incl. formamide, 20x SSC), 3x 5 min, 42°C
- Wash with Wash B (incl. 20x SSC), 3x 5 min, 60°C
- DAPI counterstain
- Mounting with Vectashield®

Tab. 1: Improved Ulmer Standard Protocol

Case	ZytoVision	CytoCell DC	CytoCell TC	Kreatech TC	Metasystems	Abbott
1	Green	Green	Green	Green	Green	Green
2	Green	Green	Green	Green	Green	Green
3	Green	Green	Green	Green	Green	Green
4	Green	Green	Green	Green	Green	Green
5	Green	Green	Green	Green	Green	Green
6	Green	Green	Green	Green	Green	Green
7	Green	Green	Green	Green	Green	Green
8	Green	Green	Green	Green	Green	Green
9	Green	Green	Green	Green	Green	Green
10	Green	Green	Green	Green	Green	Green
11	Green	Green	Green	Green	Green	Green
12	Green	Green	Green	Green	Green	Green
13	Green	Green	Green	Green	Green	Green
14	Green	Green	Green	Green	Green	Green
15	Green	Green	Green	Green	Green	Green
16	Green	Green	Green	Green	Green	Green
17	Green	Green	Green	Green	Green	Green
18	Green	Green	Green	Green	Green	Green
19	Green	Green	Green	Green	Green	Green
20	Green	Green	Green	Green	Green	Green
21	Green	Green	Green	Green	Green	Green
22	Green	Green	Green	Green	Green	Green
23	Green	Green	Green	Green	Green	Green
24	Green	Green	Green	Green	Green	Green
25	Green	Green	Green	Green	Green	Green
26	Green	Green	Green	Green	Green	Green
27	Green	Green	Green	Green	Green	Green
28	Green	Green	Green	Green	Green	Green
29	Green	Green	Green	Green	Green	Green
30	Green	Green	Green	Green	Green	Green
31	Green	Green	Green	Green	Green	Green
32	Green	Green	Green	Green	Green	Green
33	Green	Green	Green	Green	Green	Green
34	Green	Green	Green	Green	Green	Green
35	Green	Green	Green	Green	Green	Green
36	Green	Green	Green	Green	Green	Green
37	Green	Green	Green	Green	Green	Green
38	Green	Green	Green	Green	Green	Green

Adapted from Knas et al.: Graphical scheme of reciprocal translocation t(9;22)(q34;q11). grey: CML, green: evaluable; red: non-evaluable

Conclusion – Part I

Due to the better hybridization efficiency, the ZytoLight® SPEC BCR/ABL1 Dual Color Dual Fusion Probe showed best results related to signal intensity and reliability of the results.

Results

Part II – Evaluation of the hybridization efficiency by comparing different FISH protocols

Three different cases were chosen to test the hybridization efficiency (case No. 3, 8, 11) and hybridized by using all 6 commercially available FISH probes applying the Ulmer Standard Protocol, the Improved Ulmer Standard Protocol, the respective manufacturer protocol, the protocol in relation to Ventura *et al.* 2006, and the Ulmer EDTA Protocol.

Ulmer EDTA Protocol

similar to the Improved Ulmer Standard Protocol

- Deparaffinization using xylene and ethanol
- Pretreatment using EDTA-buffer (1 mM, pH 4.7), 15 min, 98°C
- Pepsin digestion (25mg/100ml), 25 min, 37°C
- 2 µl probe-mix on marked tissue area
- Probe denaturation, 10 min, 75°C
- Hybridization o/n, 37°C
- Wash with Wash A (incl. formamide, 20x SSC), 3x 5 min, 42°C
- Wash with Wash B (incl. 20x SSC), 3x 5 min, 60°C
- DAPI counterstain
- Mounting with Vectashield®

Tab.2: Comparison of Protocols (CML case No. 3)

Protocol	ZytoVision	Cytocell DC	Cytocell TC	Kreatech TC	MetaSystems	Abbott
Ulmer Standard	Red	Red	Red	Red	Red	Red
Manufacturer	Green	Red	Red	Red	Red	Red
Improved Ulmer Standard	Green	Red	Red	Red	Red	Red
Ventura <i>et al.</i> 2006	Green	Green	Green	Green	Red	Green
Ulmer EDTA	Green	Green	Green	Green	Green	Green

Adapted from Knas et al.: green: evaluable; red: non-evaluable
CML: Chronic myeloid leukemia

Conclusion – Part II

Best hybridization result was achieved by using the Ulmer EDTA Protocol and the **ZytoVision** probe!

Note: A similar excellent hybridization result was achieved by using the **ZytoVision** probe together with the **ZytoLight® FISH-Tissue Implementation Kit**.

Results

Part III – Comparison of the Ulmer EDTA Protocol to the Improved Ulmer Standard Protocol

17 cases were selected from those which have been evaluated in the first round with all 6 commercially available FISH probes. These cases were processed again by using all 6 commercially available FISH probes in combination with the Ulmer EDTA Protocol.

The comparative study showed that the first case was not evaluable, independent of probe and protocol applied. Generally, application of the Ulmer EDTA Protocol resulted in a considerably improved hybridization efficiency.

Tab.3: Ulmer EDTA-Protocol

Case	ZytoVision	Cytocell DC	Cytocell TC	Kreatech TC	Metasystems	Abbott
1	red	red	red	red	red	red
2	green	green	green	green	green	green
3	green	green	green	green	green	green
4	green	green	green	green	red	green
5	green	green	green	red	red	green
6	green	green	green	green	red	green
7	green	green	green	green	green	green
8	green	green	green	green	green	green
9	green	red	red	red	red	red
10	green	green	green	red	green	red
11	green	green	green	green	green	red
12	green	green	red	red	red	red
13	green	green	green	green	red	green
14	green	green	green	green	green	green
15	green	green	green	green	green	green
16	green	green	green	green	green	red
17	green	green	green	green	green	green

Adapted from Knas et al.: grey: CML, green: evaluable;
red: non-evaluable
EDTA: ethylenediaminetetraacetic acid

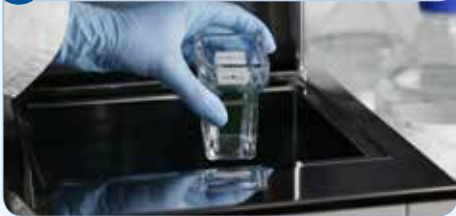
Conclusion – Part III

Application of the Ulmer EDTA Protocol generally led to significantly improved hybridization efficiency.

Protocol Workflow Overview

The protocol of the **ZytoLight® FISH-Tissue Implementation Kit** has been optimized for FFPE tissue (fixed in 10% neutrally buffered formalin) which has been cut in sections between 2-4 µm. Dewaxing with subsequent dehydration should be performed with regular changes of xylene and ethanol solutions!

1 Pretreatment



Incubate for 15 min in pre-warmed **Heat Pretreatment Solution Citric (PT1)** at 98°C.

2 Proteolysis



Apply ready-to-use **Pepsin Solution (ES1)** and incubate for approx. 15 min at 37°C in a humidity chamber.

3 Probe Application



Completely air dry section before pipetting 10 µl **ZytoLight Probe (PLXX)** each onto individual samples.

4 Cover with Coverslip



Cover the samples with a coverslip, avoiding trapped bubbles.

5 Seal with Rubber Cement



Seal the coverslip, e.g., with a layer of rubber cement.

6 Denaturation & Hybridization



Denature the slides at 75°C for 10 min and hybridize overnight at 37°C (in a humid environment).

7 Stringency Wash



Remove rubber cement and wash using 1x **Wash Buffer A** for 2x 5 min at 37°C.

8 Evaluation



Before evaluation, pipette 30 µl **DAPI/ DuraTect™-Solution (MT7)** onto the slides and cover the samples with a coverslip. Use appropriate filter sets for evaluation.

Product Information

ZytoLight® Products for FISH analysis

Prod. No.	Product	Label	Tests* (Volume)
Z-2111-50	ZytoLight SPEC BCR/ABL1 Dual Color Dual Fusion Probe CE IVD	●/●	5 (50 µl)
Z-2111-200	ZytoLight SPEC BCR/ABL1 Dual Color Dual Fusion Probe CE IVD	●/●	20 (200 µl)
Related Products			
Z-2028-5	ZytoLight FISH-Tissue Implementation Kit CE IVD Incl. Heat Pretreatment Solution Citric, 150 ml; Pepsin Solution, 1 ml; Wash Buffer SSC, 150 ml; 25x Wash Buffer A, 50 ml; DAPI/DuraTect-Solution, 0.2 ml		5
Z-2028-20	ZytoLight FISH-Tissue Implementation Kit CE IVD Incl. Heat Pretreatment Solution Citric, 500 ml; Pepsin Solution, 4 ml; Wash Buffer SSC, 500 ml; 25x Wash Buffer A, 100 ml; DAPI/DuraTect-Solution, 0.8 ml		20
Z-2099-20	ZytoLight FISH-Cytology Implementation Kit CE IVD Incl. Cytology Pepsin Solution, 4 ml; 20x Wash Buffer TBS, 50 ml; 10x MgCl ₂ , 50 ml; 10x PBS, 50 ml; Cytology Stringency Wash Buffer SSC, 500 ml; Cytology Wash Buffer SSC, 500 ml; DAPI/DuraTect-Solution, 0.8 ml		20

* Using 10 µl probe solution per test. CE IVD only available in certain countries. All other countries research use only! Please contact your local dealer for more information.

Background

The ZytoLight® SPEC BCR/ABL1 Dual Color Dual Fusion Probe is designed for the detection of the specific translocations involving the chromosomal region 9q34.12 harboring the ABL1 (a.k.a ABL) gene, and the chromosomal region 22q11.23, harboring the BCR (a.k.a. BCR1) gene. Rearrangements involving t(9;22) (q34.1;q11.2) are observed in approx. 90% of patients with chronic myeloid leukemia (CML) and in approx. 25% of adults with acute lymphoblastic leukemia (ALL). The rearrangements are cytogenetically characterized by the presence of the Philadelphia (Ph) chromosome. The translocation frequently results in the formation of a chimeric BCR/ABL1 fusion gene on the derivative chromosome 22. The gene product is a BCR/ABL1 protein with abnormal tyrosine kinase activity. In normal cells, ABL1 kinase activity is finely regulated in response to growth factors and other stimuli. The BCR/ABL1 fusion protein leads to constitutive activation of down-stream signaling pathways, including Ras, Jak/Stat and PI-3 kinase. In rare cases the BCR/ABL1 fusion gene is located on chromosomal sites other than the Ph chromosome.

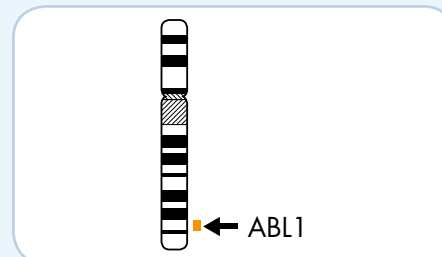
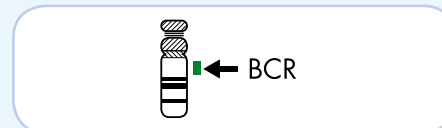
Fluorescence *in situ* Hybridization (FISH) allows for the identification of rearrangements that could otherwise not be detected by conventional karyotyping.

References

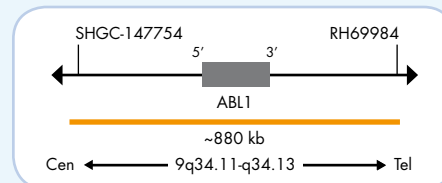
- Hehne S, et al. (2012) Pathol Res Pract 208: 510-7.
- Lim TH, et al. (2005) Ann Acad Med Singapore 34: 533-8.
- Primo D, et al. (2003) Leukemia 17: 1124-9.
- Rieder H, et al. (1998) Leukemia 12: 1473-81.
- Sessarogeo M, et al. (2000) Haematologica 85: 35-9.
- Zheng X, et al. (2009) PLoS One 4: e7661.

Probe Description

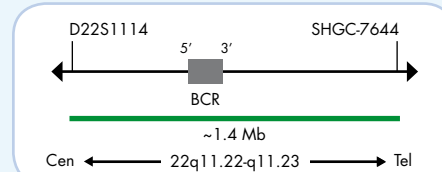
The SPEC BCR/ABL1 Dual Color Dual Fusion Probe is a mixture of a green fluorochrome direct labeled BCR probe spanning the minor and major breakpoint cluster of the BCR gene and an orange fluorochrome direct labeled ABL1 probe spanning the breakpoint region of the ABL1 gene.



Ideograms of chromosomes 22 (above) and 9 (below) indicating the hybridization locations.



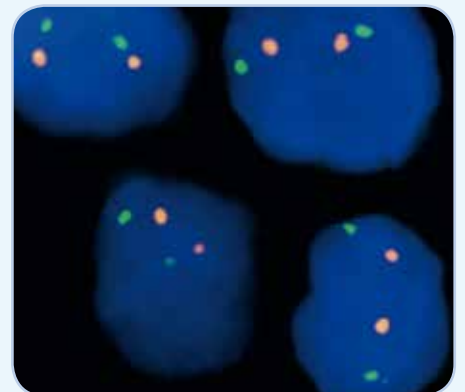
SPEC ABL1 Probe map (not to scale).



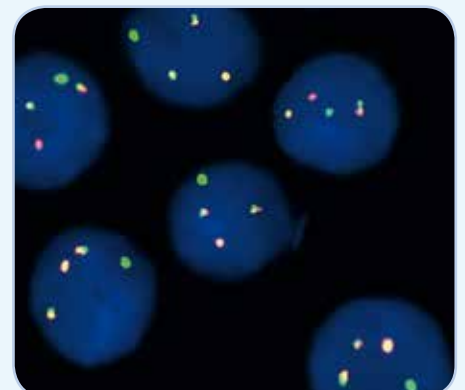
SPEC BCR Probe map (not to scale).

Results

In a normal interphase nucleus, two orange and two green signals are expected. A reciprocal translocation involving two breakpoints splits the two signals and generates a fusion signal on each of the chromosomes involved. The chromosomal regions which are not translocated are indicated by the single orange and green signal.



SPEC BCR/ABL1 Dual Color Dual Fusion Probe hybridized to normal interphase cells as indicated by two orange and two green signals in each nucleus.



Bone marrow biopsy tissue section with translocation affecting the BCR/ABL1 loci as indicated by one separate orange signal, one separate green signal and two orange/green fusion signals.

Distributors

AFRICA

Algeria, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Gabun, Guinea, Mauritania, Niger, Senegal, Chad, Tunisia
CliniSciences s.a.s
Fon: +33 9 77400909
Email: info@clinisciences.com
www.clinisciences.com

Egypt

Advanced Diagnostic Services (ADS) Ltd.
Fon: +44 7783 124383
Email: adserviceuk@aol.com
www.advands.com

Libya

Société Bioexport
Fon: +33 971 291329
Email: ofontes@wanadoo.fr
www.bio-export.com

Morocco

HexaBiogen, Groupe CliniSciences
Fon: +212 5 39933505
Email: maroc@hexabiogen.com
www.hexabiogen.com

South Africa

Cell Path Services (CPS)
Fon: +27 11 7043139
Email: cellpath@wol.co.za
www.cellpathservices.co.za

AMERICA

Argentina

BIOARS S.A.
Fon: +5411 4555 4601
Email: seccom@bioars.com.ar
www.bioars.com.ar

Brazil

Inopat Imp. E Exp. LTDA
Fon: +55 11 38650042
Email: inopat@inopat.com.br
www.inopat.com.br

Canada

ESBE Scientific
Fon: +905 4758232
Email: info@esbe.com
www.esbe.com

Chile

ProLab LTDA
Fon: +33 971 291329
Email: ofontes@wanadoo.fr
www.prolab.cl

Cuba

Société BioExport
Fon: +33 0 684064134
Email: contact@bio-export.com
www.bio-export.com

Ecuador

BIO SB, Inc.
Fon: +1 805 6922768
Email: info@biosb.com
www.biosb.com

Mexico

BIO SB, Inc.
Fon: +1 805 6922768
Email: info@biosb.com
www.biosb.com

Paraguay

BIO SB, Inc.
Fon: +1 805 6922768
Email: info@biosb.com
www.biosb.com

Tanirel SA

www.tanirel.com.uy

Uruguay

Tanirel SA
www.tanirel.com.uy

USA

Axxora LLC
Fon: +1 858 5508830
E-mail: axxora-usa@axxora.com
www.axxora.com

BIO SB, Inc.

Fon: +1 805 6922768
Email: info@biosb.com
www.biosb.com

Venezuela

Macrosearch C.A.
Fon: +58 212 9914531
Email: macrosearch@gmail.com

ASIA

Armenia

"Gysane" LLC
Fon: +374 91403610
www.davlab.am

Bahrain

ExpressMed Supplies
Fon: +973 77298888
Email: info@expressmedlabs.com
www.expressmed-supplies.com

Bangladesh

ABC Corporation
Fon: +880 17 10026938
Email: info@abc-bd.com
www.abc-bd.com

China

Anhui Huite Medical Technology
Fon: +86 551 62319209
Email: lisa_chen@vip.126.com
www.huitesci.com

Ascend Biotechnology Company, Ltd.

Fon: +86 20 34685552
Email: sales@ascendbio.cn
www.ascendbio.cn

Fuzhou Maixin Biotech, Co., Ltd

Fon: +86 800 8581156
mail: info@maxim.com.cn
www.maxim.com.cn

GeneDiagnostic Inc.

Fon: +86 571 86042915
Email: info@genediagnostic.com
www.genediagnostic.com

GeneFormation Technology Inc.

Fon: +86 10 64484022 & 64484033
Email: info@geneformation.com
www.geneformation.com

Hangzhou Xixing Medical

Technology Co., Ltd
Fon: +86 18106505953
Email: info@xxmedpharm.com
www.xxmedpharm.com

Wuhan Bioinborn Scientific Inc.

Fon: +86 027 84621823
Email: info@bioinborn.com
www.bioinborn.com

Georgia

Lab Service Georgia
Fon: +995 591273090
Email: armazi1@yahoo.com

Hong Kong

Fuzhou Maixin Biotech Co., Ltd.
Fon: +86 800 8581156
Email: info@maxim.com.cn
www.maxim.com.cn

GeneFormation Technology Inc.

Fon: +86 10 64484022 & 64484033
Email: info@geneformation.com
www.geneformation.com

Onwon Trading Ltd.

Fon: +852 27577569
Email: info@onwon.com.hk
shopping.netsuite.com/onwon

India

Diagnostic Biosystems (India)
Fon: +91 11 25703615
Email: dbsindia@vsnl.net
www.dbsiindia.net

Indonesia

Pt. Biozatix Indonesia
Fon: +62 21 47885303
Email: sales@biozatix.net
www.biozatix.net

Iran

Tashkhis Baft Aragene Co. Ltd.
Fon: +98 21 889720067
www.tbco-inc.co

Iraq

LSB Medical
Fon: +964 771 1111841
Email: info@lsbmedical.com
www.lsbmedical.com

Israel

Biotech Ltd.
Fon: +972 9 7667454
Email: biotech@biotech.co.il
www.biotech.co.il

Japan

Cosmo Bio Co., Ltd
Fon: +81 3 56329610
Email: mail@cosmobio.co.jp
www.cosmobio.co.jp

Filgen, Inc.

Fon: +82 2 6244388
E-mail: biosupport@filgen.jp
www.filgen.jp

Wako Pure Chemical Ind., Ltd.

Fon: 0120 052099
Email: labchem-tec@wako-chem.co.jp
www.wako-chem.co.jp

Jordan

Genetics Company
(Biotechnology Products and Services)
Fon: +962 6 5536402
Email: sales@genetics-jo.com
www.genetics-jo.com

Paramount International

Fon: +962 79 5970957
Email: ztaher11@hotmail.com

Lebanon

LSB Medical
Fon: +961 3 699947
Email: info@lsbmedical.com
www.lsbmedical.com

Malaysia

Nano Life Quest Sdn. Bhd.
Fon: +603 80632688
Email: info@nanolifequest.com
www.nanolifequest.com

Morocco

HexaBiogen
Fon: +212 524 358475
Email: maroc@hexabiogen.com
www.hexabiogen.com

Pakistan

Qualitron Corporation
Fon: +92 21 34539991 - 4
Email: qualitra@super.net.pk
www.qualitron.com.pk

Mongolia

Setunari LLC
Fon: +976 70177016
www.setunari.com

Russia

OPTEC LLC*
Fon: +7 495 9335151
Email: office@optecgroup.com
www.optecgroup.com

Singapore

Precision Technologies Pte Ltd
Fax: +65 62734573
Email: scitech@pretech.com.sg
www.pretech.com.sg

South Korea

ZytoVision Korea Co Ltd
Fon: +82 32 2340306
Email: help@zytovisionkorea.com

Tunisia

HexaBiogen
Fon: +216 50 762907
www.hexabiogen.com

Turkey

SitoGen Biomedikal ve Laboraturatür Sist.
San. Tic. Ltd. Şti.
Fon: +90 216 4893344
Email: sitogen@sitogen.com.tr
www.sitogen.com.tr

Vietnam

Namviet supplied technology Company
Ltd.
Fon: +84 - 4 66864744
Email: nguyentuan.ets@gmail.com

AUSTRALIA

Australia

Abacus ALS Australia
Fon: +61 7 3386 7999
Email: info@abacus-als.com
www.abacus-als.com

New Zealand

Abacus ALS New Zealand
Fon: 0800 222170
Email: info@abacus-als.co.nz
www.abacus-als.com

EUROPE

Austria

Sanova Pharma GesmbH
Fon: +43 1 801042569
Email: medicalsystems@sanova.at
www.medicalsystems.sanova.at

Belarus

Paynet LLC
Email: manager.paynet@gmail.com

Belgium

VWR International bvba
Fon: +32 16 385011
Email: info.be@vwr.com
https://be.vwr.com

Czech Republic

Pragostem s.r.o.
Fon: +420 72 5930929
Email: info@pragostem.cz
www.pragostem.cz

Denmark

AH diagnostics as
Fon: +45 87459010
Email: info@ahdiagnostics.dk
www.ahdiagnostics.dk

Ireland

Generon Ltd
Fon: +44 1753 866511
Email: info@generon.co.uk
www.generon.co.uk

Finland

AH diagnostics Oy
Fon: +358 9 3509100
Email: ahdiagnostics@ahdiagnostics.fi
www.ahdiagnostics.fi

France

CliniSciences s.a.s
Fon: +33 9 77400909
Email: info@clinisciences.com
www.clinisciences.com

Germany

ZYTOMED Systems GmbH
Fon: +49 30 804984990
Email: info@zytomed-systems.de
www.zytomed-systems.de

Greece

MENARINI Diagnostics SA
Fon: +30 21 09944950
Email: mendiagr@otenet.gr
www.menarinidiagnostics.gr

Hungary

Izinta Trading Co. Ltd.
Fon: +36 1 3922654
Email: info@izinta.hu
www.izinta.hu

Italy

Bio-Optica Milano S.p.A.
Fon: +39 2 2127131
Email: info@bio-optica.it
www.bio-optica.it

Latvia

SIA Hydrox
Fon: +371 67551517
Email: info@hydrox.lv
www.hydrox.lv

Lithuania

Medfarmos laboratorijos Ltd
Fon: +37 05 2700101
Email: medfarmoslaboratorijos@yahoo.com

SIA Hydrox

Fon: +371 67551517
Web: www.hydrox.lv

Luxembourg

Klinipath BVBA
Fon: +32 14 702100
Email: info@klinipath.be

Netherlands

Klinipath / Immunologic BV - a VWR Company
Fon: +31 316 266466
Email: info@klinipath.nl
www.klinipath.nl

Norway

AH diagnostics as
Fon: +47 2323260
Email: ahdiagnostics@ahdiagnostics.no
www.ahdiagnostics.no

Poland

ELEKTROMED Grzegorz Palkowski
Fon: +48 21 28891 40
Email: biuro@elektromed.pl
www.elektromed.com.pl

Portugal

Menarini Diagnósticos, Lda
Fon: +351 210930000
Email: mdportugal@menarinidiag.pt
www.menarinidiag.pt

Romania

SC GenomicALL Solutions SRL
Fon: +40 752081534
Email: office@genomicall.ro
www.genomicall.ro

Slovakia

Pragostem s.r.o.
Fon: +420 72 5930929
Email: info@pragostem.cz
www.pragostem.cz

Slovenia

Sanova Pharma GesmbH
Fon: +43 1 801042569
Email: medicalsystems@sanova.at
www.medicalsystems.sanova.at

Spain

Anacrom Diagnostics
Fon: +34 95 4155282
Email: anacrom@anacrom.com
www.anacrom.com

Menarini Diagnostics S.A.

Fon: +34 93 5071000
Email: informacion@menarinidiag.es
www.menarinidiag.es

Sweden

AH diagnostics ab
Fon: +45 8 6800845
Email: ahdiagnostics@ahdiagnostics.se
www.ahdiagnostics.se

Switzerland

Labforce AG
Fon: +41 61 7959620
Email: info@labforce.ch
www.labforce.ch

United Kingdom

Generon Ltd
Fon: +44 1753 866511
Email: info@generon.co.uk
www.generon.co.uk

REST OF THE WORLD

ZytoVision GmbH
Fon: +49 471 4832300
Email: export@zytovision.com
www.zytovision.com

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