



QK1727153

ISSN 1004-8685

CN 41-1192/R

# 中国卫生检验杂志

ZHONGGUO WEISHENG JIANYAN ZAZHI

2017年9月 第27卷 第17期

Sep.2017 Vol.27 No.17

CHINESE  
JOURNAL OF HEALTH  
LABORATORY TECHNOLOGY

国家卫生和计划生育委员会主管  
中华预防医学会主办

CJ  
HLT

中国科技论文统计源期刊(中国科技核心期刊)

RCCSE 中国核心学术期刊

中国生物医学源期刊

美国化学文摘(CA)源期刊

中国学术期刊综合评价数据库源期刊

17

2017

ISSN 1004-8685



9 771004 868170  
万方数据

中华预防医学会系列杂志  
SERIAL JOURNAL OF CHINESE PREVENTIVE MEDICINE ASSOCIATION

# 中国卫生检验杂志

ZHONGGUO WEISHENG JIANYAN ZAZHI

半月刊 1991 年创刊 第 27 卷 第 17 期 2017 年 9 月 10 日出版

**主管**

中华人民共和国国家卫生和计划生育委员会  
100044, 北京市西城区西直门外南路 1 号

**主办**

中华预防医学会  
100021, 北京市朝阳区华威里 25 号 5 层

**社长总编**

张绍武

**副社长**

张甜 姜友珍

**副总编**

郁庆福 李桂英 张克荣

**编辑部主任**

杨峰

**编 辑**

中国卫生检验杂志编委会

**出 版**

中国卫生检验杂志社  
450003 郑州市经一路 12 号 2288 信箱

**编辑部电话**

0371 - 65978342  
0371 - 65968289 (传真)

**广告部电话**

0371 - 65998851  
15538110112

**出版日期**

2017 年 9 月 10 日

**发 行**

国内发行: 北京市邮政局  
邮发代号: 80 - 152  
国外发行: 中国国际图书贸易总公司  
(北京 399 信箱)  
国外发行代号: M5752

**中国标准连续出版物号**

ISSN 1004 - 8685  
CN 41 - 1192/R

**广告经营许可证号**

4100004000124

**2017 年版权归中国卫生检验杂志社所有**

**定 价**

每期 21.50 元

## 目 次

### 论 著

气相色谱测定法测定工作场所空气中 N - 甲基吡咯烷酮.....

..... 柯宗枝, 郑丽辉, 万玲利, 等 (2433)

超声辅助提取 - 电感耦合等离子体质谱法测定杭州市主城区大气

PM2.5 中的 47 种元素 ..... 金铨, 任韧, 薛鸣, 等 (2436)

联合多重连接探针扩增技术和染色体微阵列分析技术在颈项透明层增

厚胎儿病因诊断中的应用 ..... 林胜谋, 陈敏, 曾婷, 等 (2441)

广西食源性鼠伤寒沙门菌血清型和分子特征研究 .....

..... 曾献莹, 吕素玲, 杜悦, 等 (2445)

直接测汞仪测定野生食用菌中总汞含量及暴露风险评估 .....

..... 周春艳, 胡黎黎, 顾万江, 等 (2448)

### 化学测定方法

气相色谱 - 质谱联用法测定工作场所空气中的 12 种乙二醇醚类化合物

..... 骆秋云, 曾细娟, 谷素英, 等 (2452)

急性杀鼠剂中毒检材的液相色谱串联质谱法快速确证 .....

..... 张英, 蔡志斌, 徐小燕, 等 (2456)

顶空 - 气相色谱 - 质谱法测定饮用水中 32 种挥发性有机物 .....

..... 丁文波 (2461)

## 本刊编委 (排名按笔画排列)

丁家华 仓公敖 方赤光 王 晏  
王 哲 王大宁 王志玉 王京宇  
王凯娟 王栩东 毋福海 冯晓燕  
叶能权 毕永毅 刘玉龙 刘运德  
刘秀梅 刘殿武 吕玉民 吕昌银  
祁建城 任一平 孙长颢 孙成均  
许春向 陈守建 何建国 何浙生  
何晓青 李 蓉 李 磊 李明武  
李晓虹 宋宏彬 吴清平 杨 元  
张 曦 张贺秋 邹学贤 姜庆五  
赵 卓 赵雁林 高永清 贾珍珍  
栗文元 凌文华 栾 燕 徐东群  
曹 佳 晁福寰 崔 巍 常风启  
黄国伟 康 辉 康维钧 韩玉霞  
韩学尧 曾现伟 窦志勇 涂 莉  
阙 飘 廖百森 裴少军 裴晓方  
谭晓东 熊 英 潘 慧 冀元棠  
穆新林

## Editorial Board Member

DING Jia - hua, CANG Gong - ao, FANG Chi - guang, WANG Min, WANG Zhe, WANG Da - ning, WANG Zhi - yu, WANG Jing - yu, WANG Kai - juan, WANG Xu - dong, WU Fu - hai, FENG Xiao - yan, YE Neng - quan, BI Yong - yi, LIU Yu - long, LIU Yun - de, LIU Xiu - mei, LIU Dian - wu, LV Yu - min, LV Chang - yin, QI Jian - cheng, REN Yi - ping, SUN Chang - hao, SUN Cheng - jun, XU Chun - xiang, CHEN Shou - jian, HE Jian - guo, HE Zhe - sheng, HE Xiao - qing, LI Rong, LI Lei, LI Ming - wu, LI Xiao - hong, SONG Hong - bin, WU Qing - ping, YANG Yuan, ZHANG Xi, ZHANG He - qiu, ZOU Xue - xian, JIANG Qing - wu, ZHAO Zhuo, ZHAO Yan - lin, GAO Yong - qing, JIA Zhen - zhen, LI Wen - yuan, LING Wen - hua, LUAN Yan, XU Dong - qun, CAO Jia, CHAO Fu - huan, CUI Wei, CHANG Feng - qi, HUANG Guo - wei, KANG Hui, KANG Wei - jun, HAN Yu - xia, HAN Xue - yao, ZENG Xian - wei, DOU Zhi - yong, PU Ping, KAN Biao, LIAO Bai - sen, PEI Shao - jun, PEI Xiao - fang, TAN Xiao - dong, XIONG Ying, PAN Hui, JI Yuan - tang, MU Xin - lin

## 网 址

www.zgwsjy.cn

## 投稿电子信箱

wsjyz@126.com

## 印 刷

鑫宏源印刷包装有限责任公司

## 来稿咨询电话

010 - 84030401

超高效液相色谱法测定大气细颗粒物中 16 种多环芳烃.....

..... 林侃 (2465)

## 实验研究

锡壶烫酒过程铅溶出情况分析 ..... 韩喜平 (2470)

Ag - MCM - 41 介孔材料体外抗菌性能研究 ..... 刘俊峰 (2472)

## 食品与药品检验

亲水作用色谱法同时测定保健品中的硫酸软骨素和氨基葡萄糖 .....

..... 王敏娟, 聂晓玲, 胡佳薇, 等 (2475)

QuEChERS 提取 - 气相色谱/质谱联用法测定食物中毒样品中的克百威

..... 李读兴, 张孟林, 李士永, 等 (2478)

超高效液相色谱 - 串联质谱联用法同时测定鸡肉中磺胺和喹诺酮类兽药

残留 ..... 高何刚, 王瑞, 杜赛, 等 (2481)

气相色谱 - 质谱法同时测定肉制品中的 12 种多环芳烃 .....

..... 曾莉, 张焰, 刘丹, 等 (2486)

## 微生物检测方法

霉菌和酵母菌显色纸片效果初步评价 .....

..... 张建明, 滕昆仑, 卢勉飞, 等 (2489)

半巢式全自动实时荧光定量核酸扩增检测技术质量控制结果分析 .....

..... 张永强, 刘兰瑞, 张雁, 等 (2492)

## 临床检验

阿尔茨海默病海马区磁共振成像表现与认知功能的相关性研究 .....

..... 王辉, 董富存, 田丽 (2494)

孕中期孕妇产前筛查和产前诊断的价值 .....

..... 王凤, 金秀萍, 王珏 (2497)

- 孕中期产前筛查标志物中位数修正的探讨 ..... 窦琳琳,杨国绘,郭远瑜 (2500)
- 急性百草枯中毒患者胸部 CT 检查及血浆降钙素原水平动态监测的临床意义 ..... 汤旭惠,陈文龙,林小琪,等 (2505)
- 宫内发育迟缓对印记基因胰岛素样生长因子 -2/过氧化物酶体增生物激活受体  $\gamma$  共激活因子 1 $\alpha$  基因表达的影响 ..... 范海玲,王丽珍,卢洪萍,等 (2508)
- 急性髓系白血病微小残留病与疾病复发的关系 ..... 陈颖,叶佩佩,陈哲,等 (2511)
- 不同类型染色体异常对男性不育的影响研究 ..... 田卫华 (2515)
- 高迁移率族蛋白 B1 和 C - 反应蛋白水平与冠心病患者冠脉斑块形态及冠心病病情的关系 ..... 负利新,王琦,王琳 (2518)
- 急性颅脑损伤患者血糖、糖化血红蛋白、同型半胱氨酸和 D - 二聚体水平的临床研究 ..... 范进峰 (2521)
- 同型半胱氨酸联合胱抑素 C 对早期糖尿病肾病的诊断价值分析 ..... 李勇杰,汪凌霄,张建飞,等 (2524)
- 中药康莱特联合化疗对乳腺癌患者 T 细胞亚群及肿瘤标志物的影响研究 ..... 蒋雪梅,贾新建,易瑛,等 (2527)
- 应用决策树卡方自动交互检验法建立血清细胞角蛋白 19 片段对非小细胞肺癌的辅助诊断模型 ..... 金霞霞,方美丹,王静 (2530)
- 多种肿瘤标志物在宫颈癌诊断中的临床应用分析 ..... 陈剑萍,叶柳青,于爱军,等 (2533)
- 均相酶免疫法检测甘胆酸的临床应用研究 ..... 陆梦丽,吕礼应 (2536)
- 布地奈德与异丙托溴铵联合雾化吸入对慢性阻塞性肺疾病急性加重期肺功能、血气指标及炎症因子的影响 ..... 莎金星,刘登河 (2539)
- 血清肿瘤标志物联合检验在结直肠癌临床诊断中的应用价值探讨 ..... 钟原胜,牟绍英 (2542)

## 分子诊断与基因检测

- 基因芯片法菌种鉴定技术在非结核诊断中的应用 ..... 陈燕飞,雷永良,陈秀英,等 (2545)
- 长链非编码 RNA 用于非小细胞肺癌诊断的 Meta 分析 ..... 裴东旭,李永伟,刘心伟,等 (2548)

## 监测分析

- 2013 年 - 2015 年渭南市食品中铅污染的监测结果分析 ..... 武建民,惠秋芳,刘孟文,等 (2551)

## 调查报告

- 2014 年 - 2016 年温州市公共场所集中空调通风系统微生物污染状况调查 ..... 胡玉琴,章乐怡,佟冬青,等 (2555)
- 慢性病患者合并人芽囊原虫感染的情况调查 ..... 胡缨,李艳文,刘晓泉,等 (2558)
- 长春市婴幼儿和青少年末梢血中铜、锌、钙、镁、铁、铅含量及相关性研究 ..... 张玫瑰,卢念红 (2561)
- 北京市 2009 年主要恶性肿瘤区域分布特征的研究 ..... 兰小琴 (2564)
- 绵阳市食品加工从业人员带菌状况分析 ..... 王乐,陈果,周良君 (2566)
- 三门峡市 2010 年 - 2016 年 HIV 抗体确证阳性者流行病学特征研究 ..... 张帅清 (2569)

## 细菌耐药性研究

- 院内获得性肺炎老年患者病原菌测定、耐药性以及危险因素分析 ..... 沈翠芬,张晓祥,辛少军 (2572)
- 检验科临床微生物培养质量的相关因素及病原菌的耐药程度研究 ..... 黄声旗,齐伟翠 (2575)

## 教学与实验室管理

- Westgard 西格玛规则在血细胞分析室内质量控制方案设计中的应用 ..... 李向平,张莎莎,贺志安 (2578)

## 综 述

- 欧盟和我国化妆品安全性评价体系的比较研究 ..... 邢书霞 (2581)

责任编辑 张舒

责任校对 陈欣欣

英文编辑 张蒙

# CHINESE JOURNAL OF HEALTH LABORATORY TECHNOLOGY

Semimonthly Established in 1991, Volume 27 Number 17 September 10, 2017

## Managed by

National Health and Family Planning Commission  
of the People's Republic of China  
No. 1, Xizhimen Wainan Road, Xicheng District, Beijing, 100044

## Sponsored by

Chinese Preventive Medicine Association  
Floor 5, No. 25 Huaweli, Chaoyang District, Beijing, 100021

## Editor in Chief

ZHANG Shao - wu

## Deputy Chairman

ZHANG Tian, JIANG You - zhen

## Associate Editor in Chief

YU Qing - fu, LI Gui - ying, ZHANG Ke - rong

## Director of Editorial Department

YANG Feng

## Edited by

Editorial Board of Chinese Journal of Health Laboratory Technology

## Published by

Editorial Department of Chinese Journal of Health Laboratory Technology  
Mailbox 2288, No. 12, Jingyi Road, Zhengzhou, 450003

## Editorial office telephone

0371 - 65978342  
0371 - 65968289 (Fax)

## Advertising department telephone

0371 - 65998851  
15538110112

## Publication Date

September 10, 2017

## Domestic Distributor

Beijing Post Bureau  
Code: 80 - 152

## Overseas Distributor

China International Book Trading Corporation  
(P. O. Box 399, Beijing, China)  
Code: M5752

## Website

www.zgwsjy.cn

## E - mail

wsjyz@126.com

## Standard Series Number

ISSN 1004 - 8685  
CN 41 - 1192/R

## Advertising Management License

4100004000124

Copyright 2017 by Editorial Department of  
Chinese Journal of Health Laboratory Technology

## Price

RMB ¥21.50

## CONTENTS IN BRIEF

### Original Articles

- Determining N - Methyl pyrrolidone in the air of workplace using gas chromatographic method ..... KE Zong - zhi, ZHENG Li - hui, WAN Ling - li, et al (2433)

- Determination of 47 elements in PM2.5 in main urban area of Hangzhou using ultrasonic - assisted extraction - inductively coupled plasma mass spectrometry ..... JIN Quan, REN Ren, XUE Ming, et al (2436)

- Etiological analysis for fetuses with increased nuchal translucency by multiplex ligation - dependent probe amplification technique and chromosome microarray analysis ..... LIN Sheng - mou, CHEN Min, ZENG Ting, et al (2441)

- Research on the serotypes and molecular typing of *Salmonella typhimurium* in Guangxi ..... ZENG Xian - ying, LV Su - ling, DU Yue, et al (2445)

- Determination and evaluation of mercury content in wild edible mushroom by direct mercury analyzer ..... ZHOU Chun - yan, HU Li - li, GU Wan - jiang, et al (2448)

### Chemical Detection Method

- Determination of 12 ethylene glycol ethers compounds by gas chromatography - mass spectrometry in workplace air ..... LUO Qiu - yun, ZENG Xi - chang, GU Su - ying, et al (2452)

- Quick confirmation of rodenticides in poisoning samples by liquid chromatography tandem mass spectrometry ..... ZHANG Ying, CAI Zhi - bin, XU Xiao - yan, et al (2456)

Determination of 32 volatile organic compounds in drinking water by headspace – gas chromatography – mass spectrometry	.....	DING Wen – bo (2461)
Determination of 16 polycyclic aromatic hydrocarbons in atmospheric fine particulate matter by ultra performance liquid chromatography	.....	LIN Kan (2465)
<b>Experimental Study</b>		
Analysis of lead dissolution in the process of wine – heating in tin pot	.....	HAN Xi – ping (2470)
Study on in vitro antibacterial activity of Ag – MCM – 41 mesoporous materials	.....	LIU Jun – feng (2472)
<b>Food and Drug Inspection</b>		
Simultaneous determination of chondroitin sulfate and glucosamine in functional foods by hydrophilic interaction liquid chromatography	.....	WANG Min – juan, NIE Xiao – ling, HU Jia – wei, et al (2475)
Determination of carbofuran in poisoned food samples by QuEChERS – gas chromatography – mass spectrometry	.....	LI Du – xing, ZHANG Meng – lin, LI Shi – yong, et al (2478)
Simultaneous determination of 16 sulfonamides and 15 quinolones in chicken by ultra – high performance liquid chromatography tandem mass spectrometry	.....	GAO He – gang, WANG Rui, DU Sai, et al (2481)
Simultaneous determination of 12 polycyclic aromatic hydrocarbons in meat products by gas chromatography – mass spectrometry	.....	ZENG Li, ZHANG Zhao, LIU Dan, et al (2486)
<b>Microbe Detection Method</b>		
Primary evaluation of count plate in the detection of yeast and mold	.....	ZHANG Jian – ming, TENG Kun – lun, LU Mian – fei, et al (2489)
Analysis of quality control on semi automatic real – time quantitative PCR detection technology	.....	ZHANG Yong – qiang, LIU Lan – rui, ZHANG Yan, et al (2492)
<b>Clinical Laboratory Test</b>		
Investigation on the correlation of magneic resonance imaging in hippocampus with cognitive function in patients with Alzheimer's disease	.....	WANG Hui, DONG Fu – cun, TIAN Li (2494)
The value of prenatal screen and diagnosis in women at mid – pregnancy age	.....	WANG Feng, JIN Xiu – ping, WANG Jue (2497)
A study on the correction of prenatal screening markers medians in the second trimester of pregnancy	.....	DOU Lin – lin, YANG Guo – hui, GUO Yuan – yu (2500)

**Clinical significance of chest CT examination and dynamic plasma PCT level detection in patients with acute paraquat poisoning**

..... TANG Xu - hui, CHEN Wen - long, LIN Xiao - qi, et al (2505)

**Influence of intrauterine growth retardation on imprinted gene *IGF - 2/PGC - 1α***

..... FAN Hai - ling, WANG Li - zhen, LU Hong - ping, et al (2508)

**The relationship between minimal residual disease and relapse of acute myeloid leukemia**

..... CHEN Ying, YE Pei - pei, CHEN Zhe, et al (2511)

**Effects of different types of chromosomal abnormality on male sterility**

..... TIAN Wei - hua (2515)

**Relationship of high mobility group protein B1 and CRP levels with coronary plaque morphology and coronary heart disease in patients with coronary heart disease**

..... YUN Li - xin, WANG Qi, WANG Lin (2518)

**The clinical study of fasting blood - glucose, glycosylated hemoglobin, homocysteine and D - dimer levels in patients with acute brain injury**

..... FAN Jin - feng (2521)

**Significance of combined detection of serum Hcy and Cys - C in the diagnosis of early renal injury in diabetes**

..... LI Yong - jie, WANG Ling - xiao, ZHANG Jian - fei, et al (2524)

**Study on the effect of Kanglaite injection combined with chemotherapy on T cell subsets and tumor markers in patients with breast cancer**

..... JIANG Xue - mei, JIA Xin - jian, YI Ying, et al (2527)

**Application of exhaustive CHAID method in establishing the diagnosis model of CYFRA19 in non - small cell lung cancer**

..... JIN Xia - xia, FANG Mei - dan, WANG Jing (2530)

**Clinical application of various tumor markers in the diagnosis of cervical cancer**

..... CHEN Jian - ping, YE Liu - qing, YU Ai - jun, et al (2533)

**Clinical research on the detection of glycocholic acid by homogeneous enzyme immunoassay**

..... LU Meng - li, LV Li - ying (2536)

**The effects of atomized inhalation of budesonide combined with ipratropium bromide on pulmonary function, blood gas index and inflammatory factor in patients with acute exacerbation of chronic obstructive pulmonary disease**

..... MAO Jin - xing, LIU Deng - he (2539)

**Exploration on the joint test value of serum tumor markers in the diagnosis of colorectal cancer**

..... ZHONG Yuan - sheng, MU Shao - ying (2542)

**Molecular Diagnosis and Gene Detection**

**Application of microarray technology in the diagnosis of non - tuberculosis**

..... CHEN Yan - fei, LEI Yong - liang, CHEN Xiu - ying, et al (2545)

## **Diagnostic efficacy of long – noncoding RNAs as biomarkers for non – small cell lung cancer identification: a Meta – analysis**

..... PEI Dong – xu, LI Yong – wei, LIU Xin – wei, et al (2548)

## **Monitoring and Analysis**

### **Monitoring results analysis of lead pollution in food in Weinan from 2013 to 2015 .....**

..... WU Jian – min, HUI Qiu – fang, LIU Meng – wen, et al (2551)

## **Investigation Report**

### **Microbial contamination of central air condition ventilation systems in public places of Wenzhou during 2014 – 2016 .....**

..... HU Yu – qin, ZHANG Le – yi, TONG Dong – qing, et al (2555)

### **Investigation of infection in patients with chronic diseases ..... HU Ying, LI Yan – wen, LIU Xiao – quan, et al (2558)**

### **Study on the content and correlation of Cu, Zn, Ca, Mg, Fe and Pb in peripheral blood of infants and adolescents in chang-chun ..... ZHANG Mei – na, LU Nian – hong (2561)**

### **Study on the area distribution of malignant tumor in Beijing in 2009 ..... LAN Xiao – qin (2564)**

### **Analysis of bacteria carrying situation in food processing practitioners in Mianyang .....**

..... WANG Le, CHEN Guo, ZHOU Liang – jun (2566)

### **Epidemiological characteristics research on the HIV anti – body confirmed positive humen in Sanmenxia during 2010 – 2016 .....**

..... ZHANG Shuai – qing (2569)

## **Bacterial Resistance Research**

### **Study of pathogen detection, drug resistance and risk factors in hospital acquired pneumonia patients .....**

..... SHEN Cui – fen, ZHANG Xiao – xiang, XIN Shao – jun (2572)

### **Study on the factors related to the quality of clinical microorganism culture quality and the drug resistance degrees of pathogenic bacteria in the laboratory ..... HUANG Sheng – qi, QI Wei – cui (2575)**

**Editor in Charge** ZHANG Shu

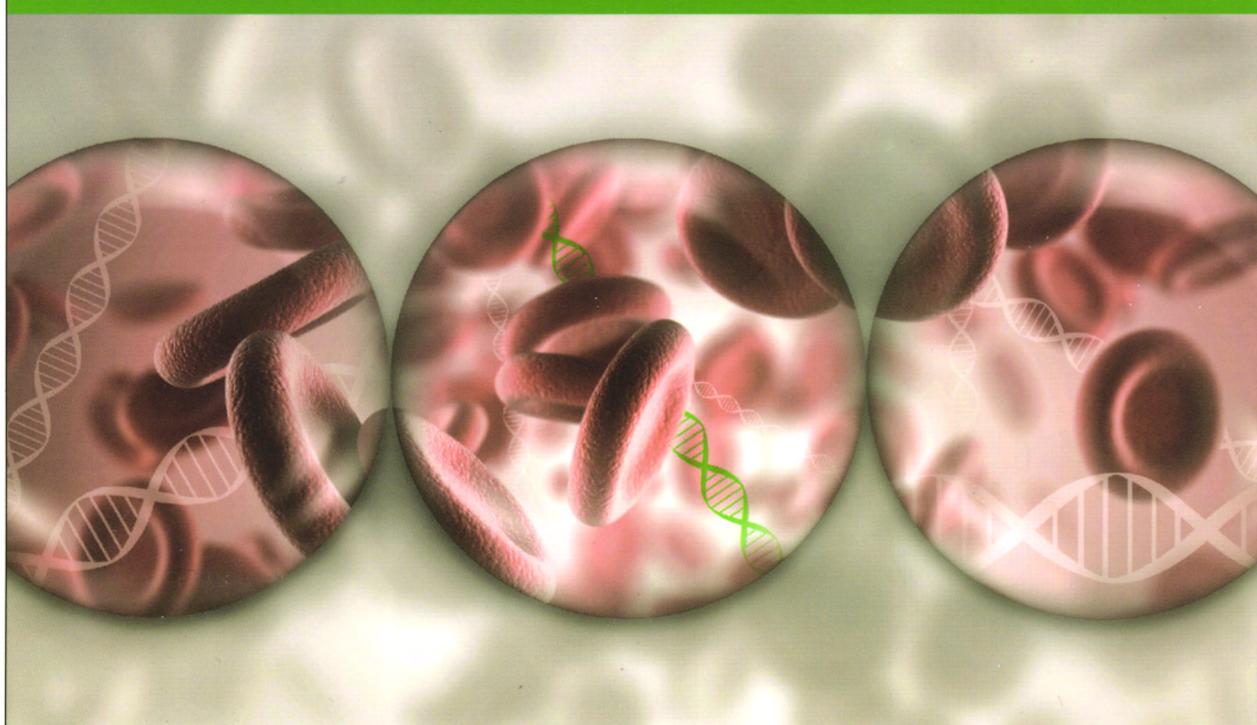
**Responsibility of Proofreading** CHEN Xin – xin

**English Editor** ZHANG Meng

液体活检

洞察明细，愈见清晰

# 微滴式数字PCR



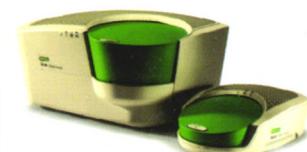
## 微滴式数字PCR，向液体活检进发！

Bio-Rad QX200™ 微滴式数字PCR (ddPCR™) 系统能克服高丰度野生型序列背景的干扰，快速地从外周血、尿液、胸腔积液、脑脊液等样本中定量检测肿瘤相关的分子标志物，具有更高的检测灵敏度和重复性。ddPCR™与液体活检相结合，不仅可以实现肿瘤的早期筛查和分子分型，还可以实现治疗效果的评估、耐药及复发的早期预测，为精准医疗方案的制定和调整提供重要信息。

更多 Bio-Rad QX200™ ddPCR™ 与液体活检应用的信息请访问  
[bio-rad.com/Info/LiquidBiopsy](http://bio-rad.com/Info/LiquidBiopsy)



请关注Bio-Rad微信公众号



伯乐公司中国呼叫中心：800-820-5567, 021-61898504

欢迎访问：<http://www.bio-rad.com>

**BIO-RAD**