**关于“磁标记探针免疫层析检测系统关键技术及应用”项目提名河南省科学技术奖的公示材料**

**项目名称：**磁标记探针免疫层析检测系统关键技术及应用

**提名者及提名等级：**河南省科学技术协会

河南省科学技术进步奖二等奖

**主要知识产权和标准规范目录：**

1、发明专利：一种免疫层析试纸条及其制作方法与检测方法，中国，ZL201510058145.1

2、发明专利：一种磁性传感器及基于其的免疫层析芯片检测系统，中国，ZL201710698183.2

3、发明专利：一种磁性纳米粒子测量位置的优化设计方法，中国，ZL201811512239. 1

4、发明专利：一种用于超顺磁性免疫层析芯片的标准抗原稀释液，中国，ZL201810420878.9

5、发明专利：一种针对磁性层析芯片的可自定位传动装置，中国，ZL201910542780.5

6、发明专利：基于磁传感器的免疫层析芯片检测系统，柬埔寨，KH/RRPCN/2020/00068

7、发明专利：一种基于磁信号的磁性纳米粒子质量检测方法，中国，ZL201811604730.7

8、发明专利：一种磁性纳米粒子仿真测试平台的优化设计方法及装置，中国，ZL201811527095.7

9、软件著作权：磁性纳米粒子免疫层析芯片检测软件，中国，2018SR861578

**论文（专著）目录：**

1、Gang Lv, Hong Zhang, Xuecheng Cao, Yaowen Liu, Zhiwei Hou\*, Yufeng Qin, Guihua Li, Linhui Wang. Modeling of magnetization precession in spin-torque nano-oscillators with a tilted polarizer[J]. AIP Advances,2015,5(7):077171.

2、Wenfeng Li, Gui Yang, Jianwei Zhang, Zhiwei Hou\*,. Electronic structures and thermoelectric properties of CuMTe2 (M = Al, Ga, In) copper chalcopyrites: a first-principles study[J]. The European physical journal, B. Condensed matter physics,2015,88(12):330.

3、于景新,侯志伟\*,刘秀英.Stability of conductance oscillations in carbon atomic chains[J].Chinese Physics B,2015,24(06):544-548.

4、Yanrong Chen, Kan Wang \*, Zongrui Liu, Rongjin Sun, Daxiang Cui, Jinghua He. Rapid detection and quantification of tumor marker carbohydrate antigen 72-4 (CA72-4) using a superparamagnetic immunochromatographic strip[J]. Analytical and bioanalytical chemistry,2016,408(9):2319-27.

5、Huaming Lei, Kan Wang\*, Xiaojun Ji, Daxiang Cui. Contactless Measurement of Magnetic Nanoparticles on Lateral Flow Strips Using Tunneling Magnetoresistance (TMR) Sensors in Differential Configuration[J]. Sensors,2016,16(12):2130.

6、Wenting Lu, Kan Wang\*, Kun Xiao, Weijian Qin, Yafei Hou, Hao Xu, Xinyu Yan, Yanrong Chen, Daxiang Cui, Jinghua He. Dual Immunomagnetic Nanobeads-Based Lateral Flow Test Strip for Simultaneous Quantitative Detection of Carcinoembryonic Antigen and Neuron Specific Enolase[J]. Scientific reports,2017,7(1):42414.

7、Lixin Hong, Kan Wang\*, Wenqiang Yan, Hao Xu, Qinghui Chen, Yuhui Zhang, Daxiang Cui, Qinghui Jin, Jinghua He. High performance immunochromatographic assay for simultaneous quantitative detection of multiplex cardiac markers based on magnetic nanobeads[J]. Theranostics,2018,8(22):6121-6131.

8、吕刚,张红,侯志伟\*.具有倾斜极化层的自旋阀结构中磁翻转以及磁振荡模式的微磁模拟[J].物理学报,2018,67(17):262-268.

9、Wenqiang Yan, Kan Wang\*, Hao Xu, Xuyang Huo, Qinghui Jin, Daxiang Cui. Machine Learning Approach to Enhance the Performance of MNP-Labeled Lateral Flow Immunoassay[J]. Nano-Micro Letters,2019,11(01):132-146.

10、Li Wang\*,Tong Zhou, Qunfeng Niu, Yanbo Hui, Zhiwei Hou\*. A Method and Device for Detecting the Number of Magnetic Nanoparticles Based on Weak Magnetic Signal[J]. Processes,2019,7(8):480.

11、Bo Cao, Kan Wang\*,Hao Xu, Qi Qin, Jinchuan Yang, Wei Zheng, Qinghui Jin, Daxiang Cui. Development of magnetic sensor technologies for point-of-care testing: Fundamentals, methodologies and applications[J]. Sensors and Actuators: A. Physical,2020,312:112130.

12、Gang Lv, Hong Zhang, Ziyan Jia, Feng Gao, Guihua Li, Fengwei Sun, Sai Zhou, Cuixiu Zheng, Yaowen Liu, Zhiwei Hou\*, Chao Zhang. Spin torque nano-oscillators based on isolated edge skyrmions in nano-pillars with perpendicular anisotropy[J]. Physics Letters A,2021,406:127448.

13、Tangan Li, Kan Wang \*, Chujun Zheng, Wei Zheng, Yuemeng Cheng, Qihong Ning, Hao Xu, Daxiang Cui. Magnetic frequency mixing technological advances for the practical improvement of point-of-care testing.[J]. Biotechnology and bioengineering,2021,119(2):347-360.

14、Kan Wang\*, Tangan Li, Bo Cao, Hao Xu, Yuemeng Cheng, Chujun Zheng, Wei Zheng, Daxiang Cui. Simulation and improvements of a magnetic flux sensor for application in immunomagnetic biosensing platforms[J]. Sensors and Actuators: A. Physical,2022,333:113299.

15、李霞,侯志伟\*.钉扎层磁矩倾斜角度对微波频率的影响[J].河南师范大学学报(自然科学版),2016,44(03):71-74.

16、惠延波,刘任波,王莉\*,牛群峰.一种基于TMR的地磁场测试平台设计[J].仪表技术与传感器,2018(10):103-106+112.

17、惠延波,刘任波,王莉\*,牛群峰.基于Hilbert-Huang变换的室内地磁信号处理分析[J].科学技术与工程,2019,19(25):250-255.

18、牛群峰,赵旭燕\*,惠延波,王莉\*,周潼,刘任波.基于TMR磁传感器的黄曲霉毒素B\_1定量检测方法研究[J].河南工业大学学报(自然科学版),2020,41(03):84-88.

19、常鑫茹,惠延波,王莉\*,赵旭燕\*.基于弱磁信号的赭曲霉毒素A定量检测方法研究[J].河南工业大学学报(自然科学版),2022,43(01):107-112.

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