



# Effect of gold nanoparticle contamination in urine amphetamine test

Beuy Joob<sup>1\*</sup>, Viroj Wiwanitkit<sup>2</sup>

## Abstract

Nanotechnology is widely used at present. The effect of nanoparticle on health aspect is an important consideration. Whereas the nanoparticle is proven useful in clinical aspect, the negative effect should be mentioned. The interference of nanoparticle on clinical laboratory investigation is an important issue. Here, the authors assess the effect of gold nanoparticle contamination in urine amphetamine test. According to the study, the interference can be seen. The false positive of the test due to the contamination is observed. The effect of nanoparticle on the clinical forensic laboratory test is the new issue to be considered at present.

**Keywords:** Urine, amphetamine, Nanoparticle, Interference

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## Introduction

Nanotechnology becomes widely in several applications in the present day. The effect of nanoparticle on health aspect is an important issue. Application of nanoparticles is proven useful in diagnosis and treatment in clinical practice (1-3). Nevertheless, the negative effect should be mentioned. The interference of nanoparticle on clinical laboratory investigation is an important issue.

## Objectives

Here, the authors assess the effect of gold nanoparticle contamination in urine amphetamine test, an important basic clinical forensic science investigation.

## Materials and Methods

This is a laboratory experiment to assess the effect of gold nanoparticle contamination of the urine amphetamine test. The authors use the same protocol as that in the previous published reports for evaluation of the interference effect of gold nanoparticle on the clinical laboratory investigation (4–6). Overall 100 urine samples, including 5 positive and 5 negative amphetamine test result by standard HPLC confirmation were used for the present study. Briefly, each sample was divided into two parts. The first part was added with 1 µL of gold nanoparticle solution and the second part was not added. All samples were analyzed for urine amphetamine by simple urine amphetamine strip test. The research followed the Tenets

of the Declaration of Helsinki.

## Results

According to the study, the positive and negative results still remain in the urine samples without gold nanoparticle adding. However, there is a change of the result in the urine sample with gold nanoparticle adding. The changing of result is presented in Table 1. There are 2 cases (2 %) of false positive result of urine amphetamine strip test in analyzing of urine samples with gold nanoparticle adding.

## Discussion

Urine narcotic drug investigation is an important group of clinical forensic laboratory testing. The test is widely used in clinical practice in the area with the problem of narcotic drug such as Indochina. In routine screening, urine amphetamine test is the basic laboratory tool. The basic urine amphetamine strip test is commonly used. An important concern is usually on the false positive result of the urine amphetamine strip test (7). The confirmation is needed for any positive case since the final positive result implies further medicolegal issue.

There are many possible factors leading to false positive result of urine amphetamine strip test. The good examples are basic drugs. In the present study, the authors can demonstrate the possible effect of gold nanoparticle on the test. The nanoparticle can generate false positive result. In fact, the nanoparticle contamination is proven as

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<sup>1</sup>Sanitation1 Medical Academic Center, Bangkok Thailand. <sup>2</sup>Honorary professor, Dr DY Patil University, Pune India; visiting professor, Hainan Medical University, China; adjunct professor, Joseph Ayobabalola University, Nigeria; visiting professor, Faculty of Medicine, University of Nis, Serbia.

\*Corresponding Author: Beuy Joob, Email: [beuyjoob@hotmail.com](mailto:beuyjoob@hotmail.com)

**Table 1.** Urine amphetamine test result in samples with gold nanoparticle adding

Urine strip test	HPLD references test	
	Positive	Negative
Positive	5	2
Negative	0	93

an important interference for many clinical investigations such as VDRL (venereal disease research laboratory) test (4). Due to the widely use of nanotechnology at present, the effect of nanoparticle on the clinical forensic laboratory test is the new issue to be considered at present.

**Conclusion**

In conclusion, the gold nanoparticle can result in interference of urine amphetamine test. The false positive in urine strip test is possible if there is a contamination.

**Authors’ contribution**

Both authors wrote the manuscript equally.

**Conflicts of interest**

The authors declared no competing interests.

**Ethical considerations**

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

**Implication for health policy/practice/research/medical education**

Gold nanoparticles can result in interference of urine amphetamine test. The false positive in urine strip test is possible if there is a contamination.

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**References**

1. Cao R, Villalonga R, Fragoso A. IEE Towards nanomedicine with a supramolecular approach: a review. *Proc Nanobiotechnol.* 2005; 152:159-64.
2. Freitas RA Jr. What is nanomedicine? *Dis Mon.* 2005; 51:325-41.
3. Emerich DF. Nanomedicine--prospective therapeutic and diagnostic applications. *Expert Opin Biol Ther.* 2005; 5:1-5.
4. Wiwanitkit V. Effect of gold nanoparticle solution on VDRL reactive CSF. *Arq Neuropsiquiatr.* 2014; 72:477.
5. Wiwanitkit V, Sereemaspun A, Rojanathanes R. Effect of gold nanoparticle on the microscopic morphology of white blood cell. *Cytopathology.* 2009; 20:109-10.
6. Wiwanitkit V, Sereemaspun A, Rojanathanes R. Gold nanoparticles and a microscopic view of platelets: a preliminary observation. *Cardiovasc J Afr.* 2009; 20:141-2.
7. Schwartz RH. Urine testing in the detection of drugs of abuse. *Arch Intern Med.* 1988; 148:2407-12.