1 Yield Calculation

Yield of AuNPs formation was calculated as follows: 198µg of $HAuClO_4$ of starting material was used. This represents Au^{3+} concentration of 6.6mg mL^{-1} with an integrated absorbance of 175 a.u.[2] Upon gold reduction and subsequent MIP polymerization, LSPR spectral shift can be observed from 422nm to 521nm while the integrated absorbance drops to 125 a.u.[2] which represents Au^{3+} concentration of 4.71mg mL^{-1}. This represents a reaction yield of 71.4 %.

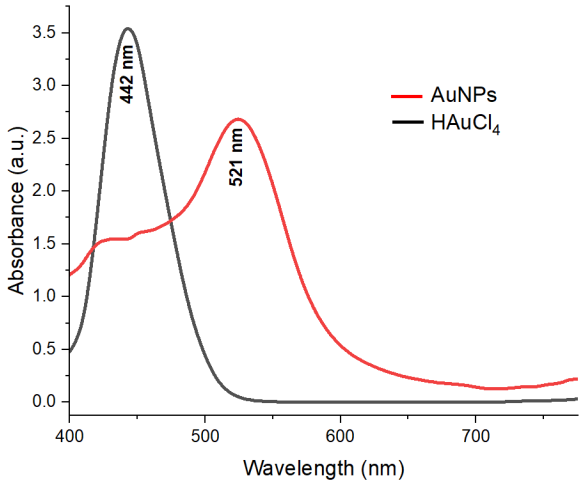


Figure S1. LSPR Spectra of $HAuClO_4$ Solution and AuMIPs formed using chloroauric acid. Data was recorded in solution using NanoSPR 103 Instrument.

2 AuMIPs Morphology

Topography images of the immobilized AuMIPs were obtained using a Bruker BioScope Resolve Atomic Force Microscope (AFM) in tapping mode and silicon cantilevers (RTEPSA-525, spring constant 200N/m, tip radius 8nm). Images were analysed using NanoScope Analysis 2.0 software.

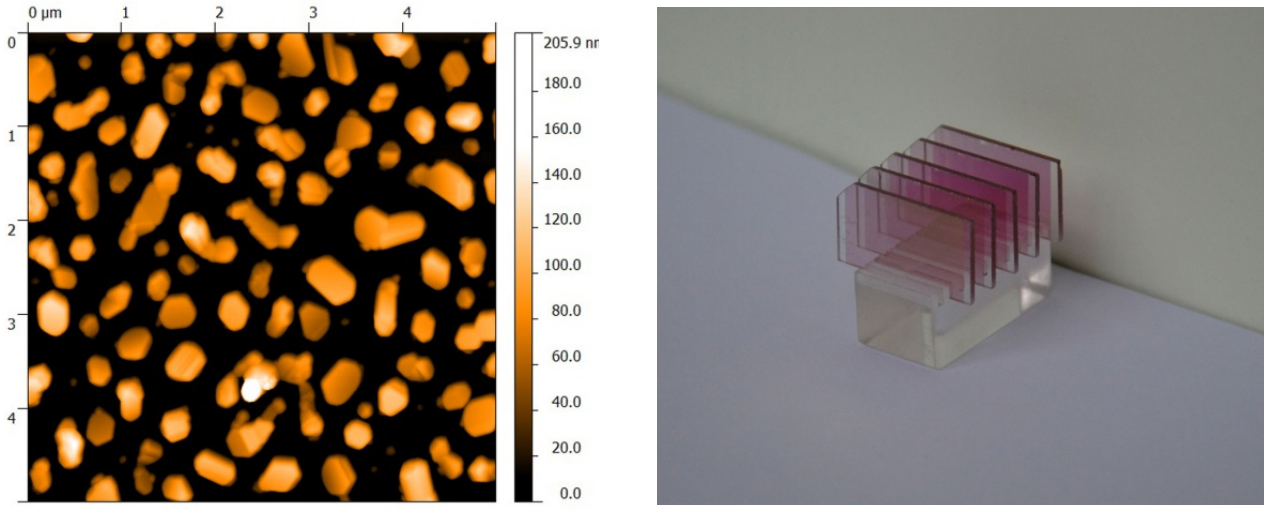


Figure S2. Au LSPR Nanochips. Left - typical atomic force microscopy image of immobilized AuMIPs. Right - photographic image of Au coated glass slides.

3 AuMIPs Application as Sensors

Detector mode of operation: signals from photodetectors (in the form of a photocurrent) are converted by photo amplifiers into a voltage and then by an analog-to-digital converter (ADC) into digital form, and then processed by microprocessor. The result of processing is the numerical values of the voltage at the inputs of the ADC (in the calibration mode) or the numerical values of the OD (in the normal operation mode). The measurement data are output to the indicator or to the personal computer (via the serial interface) or to the smartphone via Bluetooth.

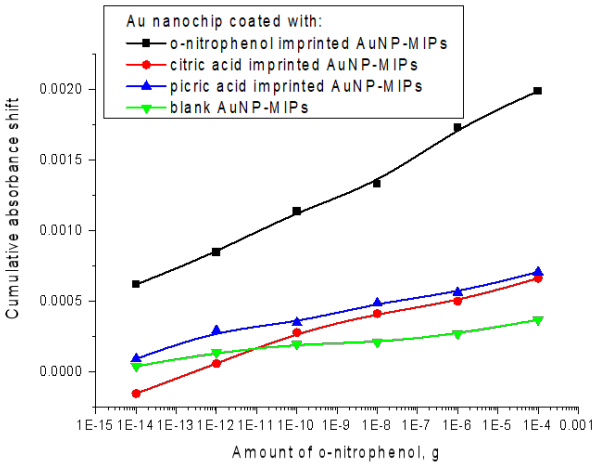


Figure S3. Cumulative dose-response dependences for different Au LSPR nanochips upon exposure to o-nitrophenol vapor from different amounts of the explosive analogue.

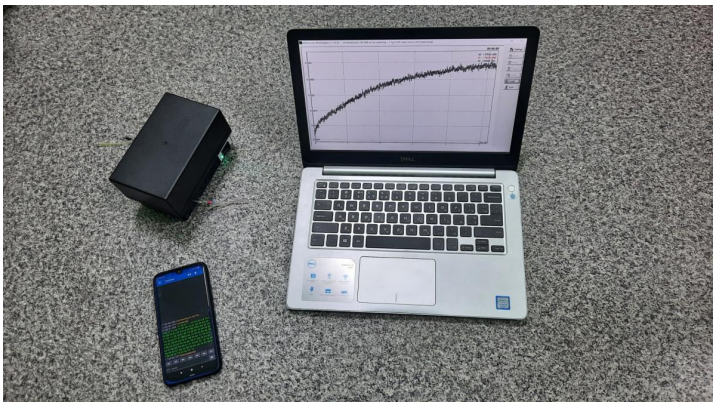


Figure S4. Prototype detector for explosives detection in field application with the options to work on both vapor and liquid samples and operation steps of sensor work. Use of laptop allows for recording of the target concentration gradient while developed smartphone application provides a mobile and user-friendly method of explosives detection in qualitative mode.

4 AuMIPs Immobilization

Immobilization of Au-MIPs on Au coated glass slides was conducted as follows: 1-Ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and *N*-Hydroxy succinimide (NHS) were added in 1/1.5 molar ratio to 100mM PBS buffer into which 0.1nM of AuMIPs was added. Au coated glass slides (NanoSpr, Chicago, USA) were treated with mercaptoundecanoic acid (10nM in EtOH) overnight and then dried using N_2 stream. Afterwards they were submerged into the EDC/NHS AuMIPs solution (pH 7) for 30 mins, dried using N_2 stream and used for target detection.

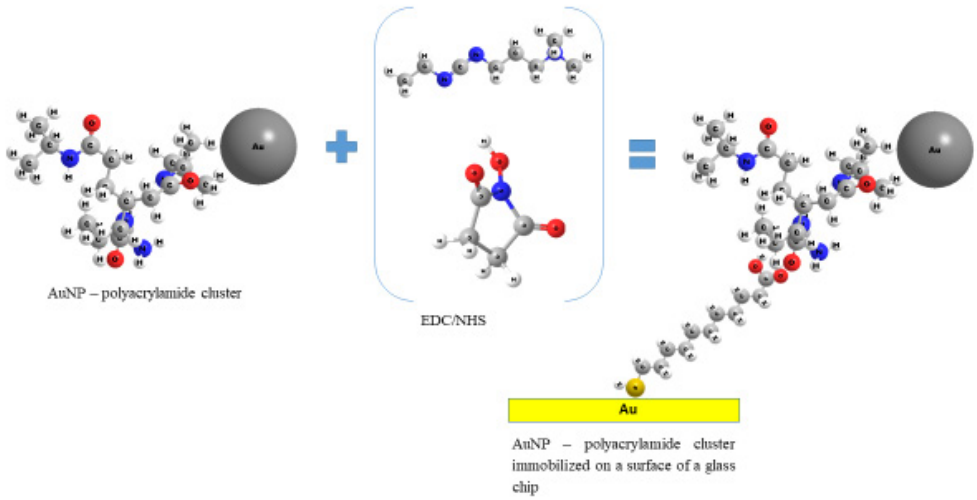


Figure S5. Graphic representation of Au-MIPs immobilization on Au coated glass slides.