Detection of Lung Cancer Biomarkers: A Catalytic Assay Strategy Based on Gold Alloy Nanoparticles

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Lung cancer is an incredibly dangerous and deadly form of cancer without a consistent and inexpensive cure. Most lung cancer detection methods are expensive, complex, and detect the cancer at stages too late for effective treatment. This paper proposes a new way in which lung cancer can be properly diagnosed and tested for, even in its early stages. The reduction of 4-nitrophenol to 4-aminophenol by NaBH4 poses important implications for catalysis due to the marked color change that occurs during the reaction. By utilizing gold alloy nanoparticles as a catalyst, the color change can be clearly seen in a matter of minutes. Using UV-Vis spectroscopy, the progress and state of the reaction can both be accurately tested for as the reaction takes place. By testing the reaction rates, the presence of carcinoembryonic antigen (CEA), a prime biomarker for lung cancer, can be tested for via the implementation of anti-CEA. These findings show that there are methods that can be utilized to diagnose and monitor the status of lung cancer in its early stages in an inexpensive and simple manner.

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