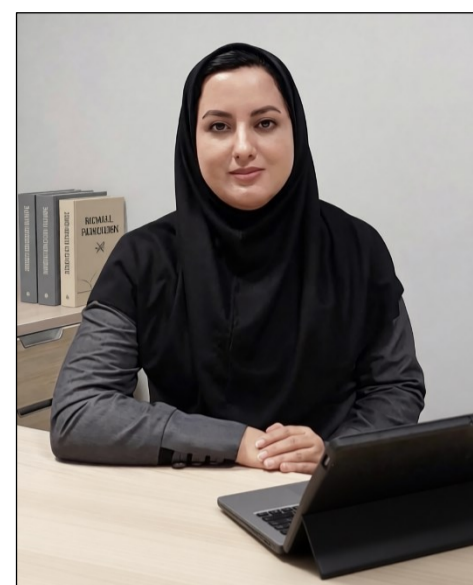

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Position

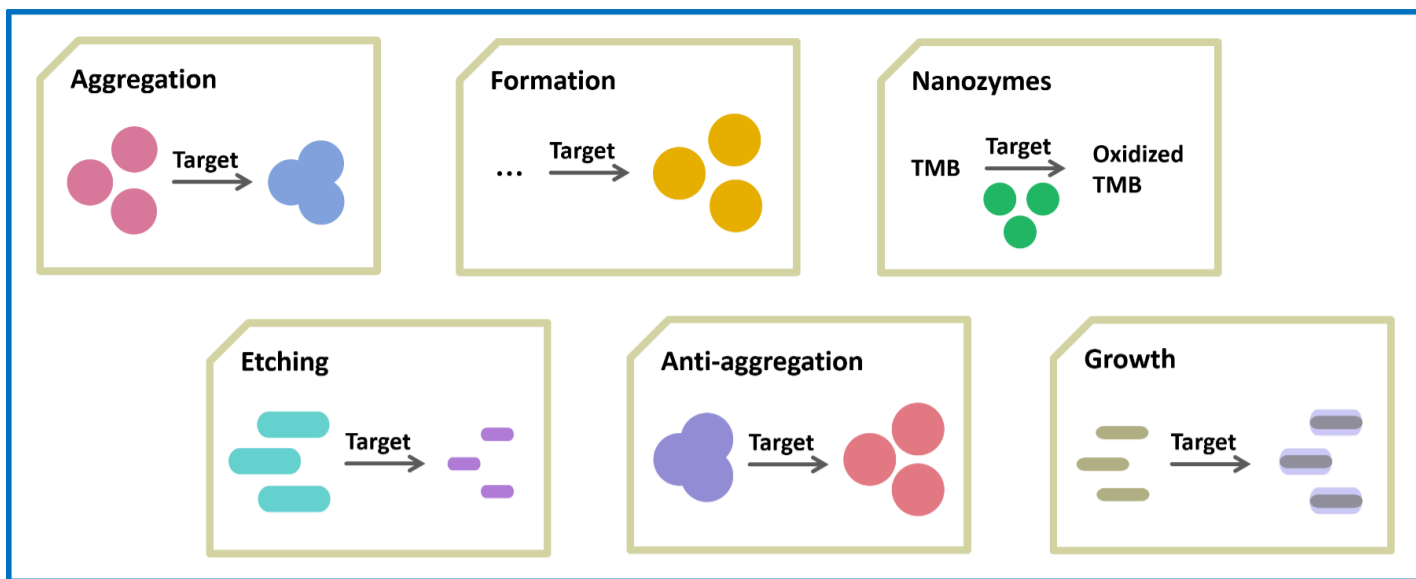
- **Assistant Professor**
Department of Nanotechnology, Agricultural Biotechnology Research Institute of Iran, 2018-Present
- **Manager of Research Affairs**
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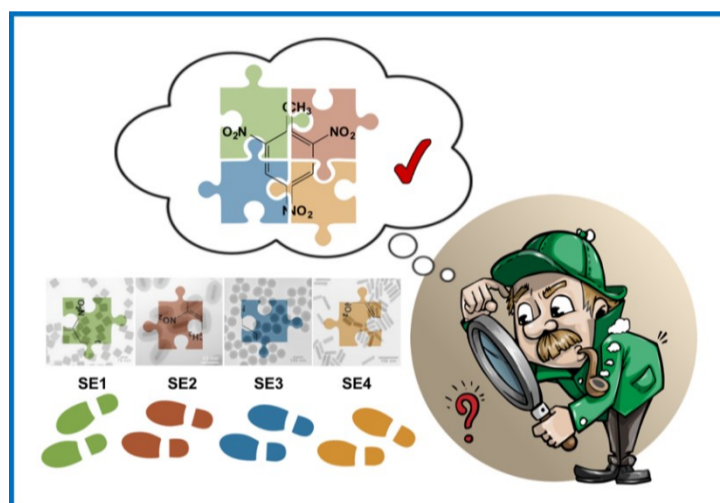
Education

- **Post doctorate**
Sharif University of Technology, Tehran-Iran, 2017-2018
Thesis: "Design of ratiometric fluorescent nanoprobes for naked-eye detection"
- **Post doctorate**
Tehran University of Medical Sciences, Tehran-Iran, 2016-2017
Thesis: "Design and fabrication of nanostructured substrates for the detection of biomolecules"
- **PhD in Analytical Chemistry**
Sharif University of Technology, Tehran-Iran, 2012-2016
Thesis: "Colorimetric sensor array design for classification and detection of nanoparticles and biomolecules"
- **Sabbatical leave**
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Thesis: "Recognition of biologically relevant glycans by surface-enhanced Raman spectroscopy"
- **MS in Analytical Chemistry**
Sharif University of Technology, Tehran-Iran, 2010-2012
Thesis: "Determination of protein absorption profile at the surface of biocompatible superparamagnetic iron oxide nanoparticles using gel electrophoresis"
- **BS in Applied Chemistry**
University of Kharazmi, Karaj-Iran, 2006-2010



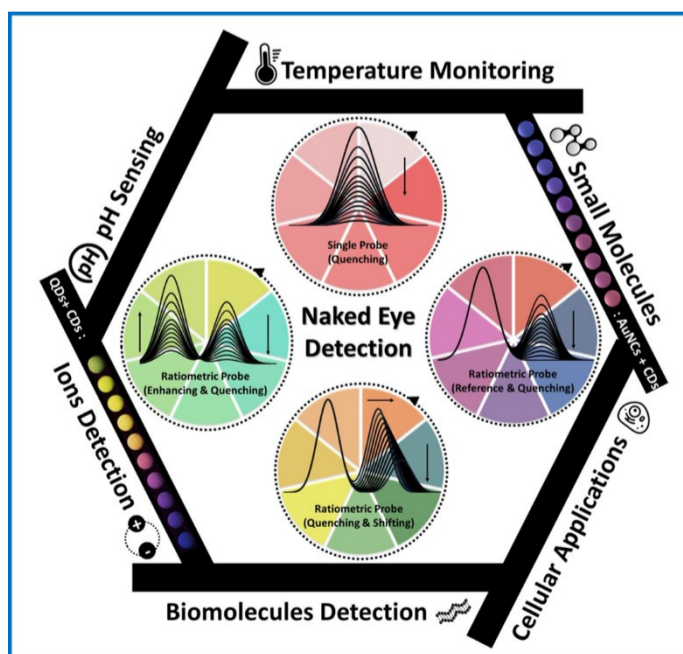
Nanoparticle-Based Optical Sensor Arrays

Moving from specific individual lock-and-key sensors towards cross-reactive sensor arrays enables the recognition of groups of target species. This differential sensing has been inspired from nature's use of arrays of receptors in the senses of taste and smell. Each receptor has a semi-selective response to a particular analyte and the specificity of the sensor is accomplished by pattern-based recognition in which distinct response patterns are attained for each analyte. Developing a sensor array seems like employing a detective whom gathers clues from several evidences to reveal the truth (Nanoscale, 9, 2017, 16546).



Ratiometric Fluorescent Nanoprobes

Signal generation mechanisms for naked-eye detection of analytes are becoming popular in various sensing fields. Among various naked-eye detection approaches being explored for quantitative measurements, ratiometric fluorescence sensing has received particular attention as a potential technique to overcome the limitations of intensity-based probes. This technique relies on changes in the intensity of two or more emission bands in the presence of the analyte, resulting in effective internal referencing and vivid color changes (Analytica Chimica Acta, 1079, 2019, 30-58).



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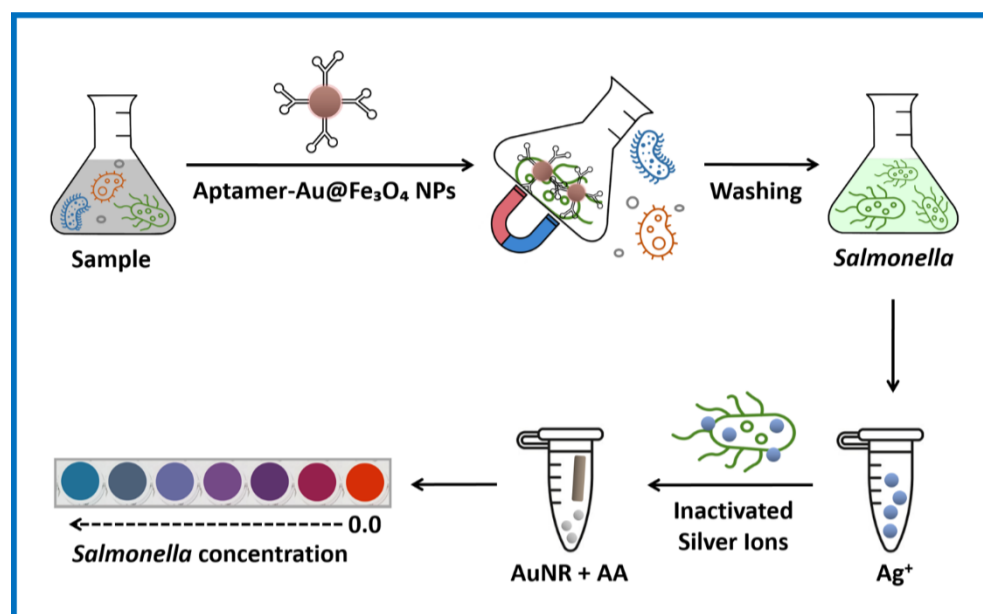
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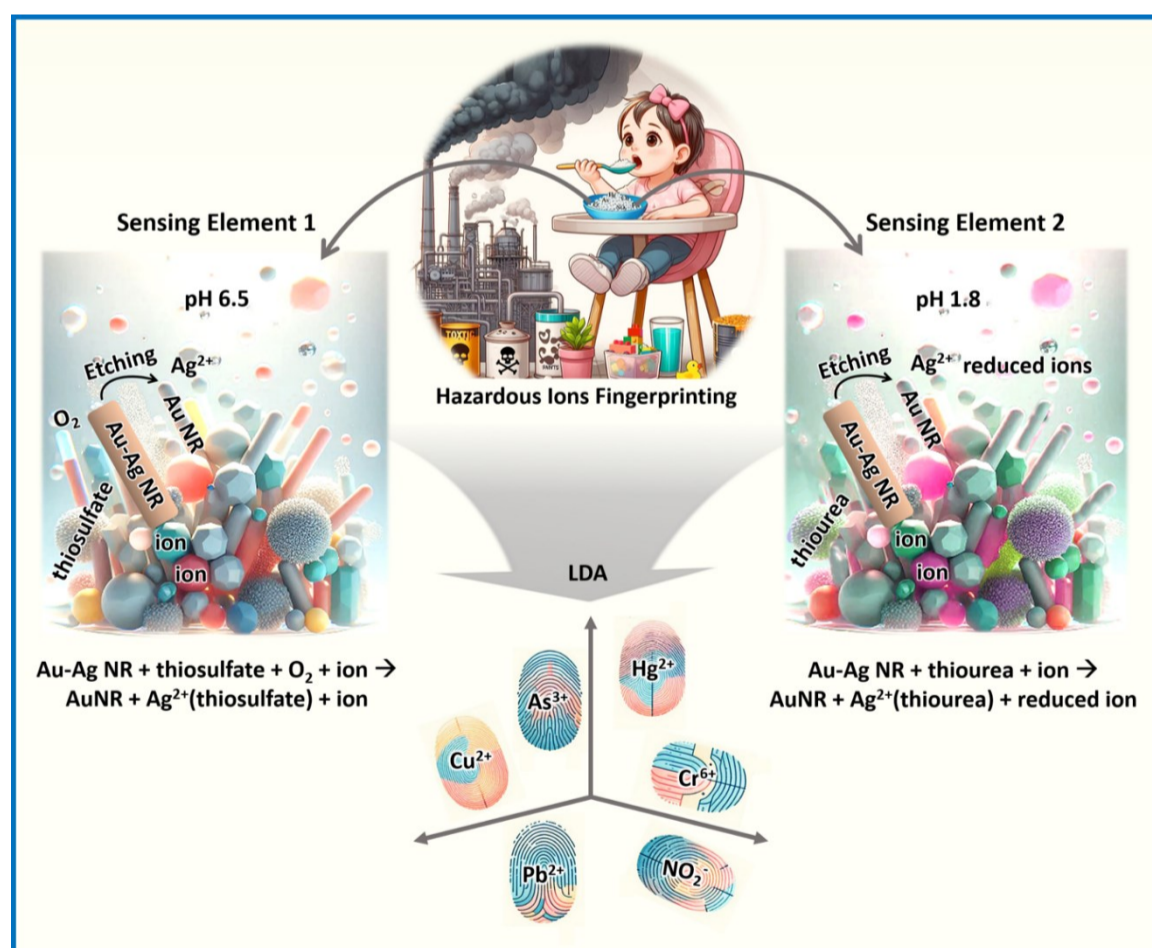
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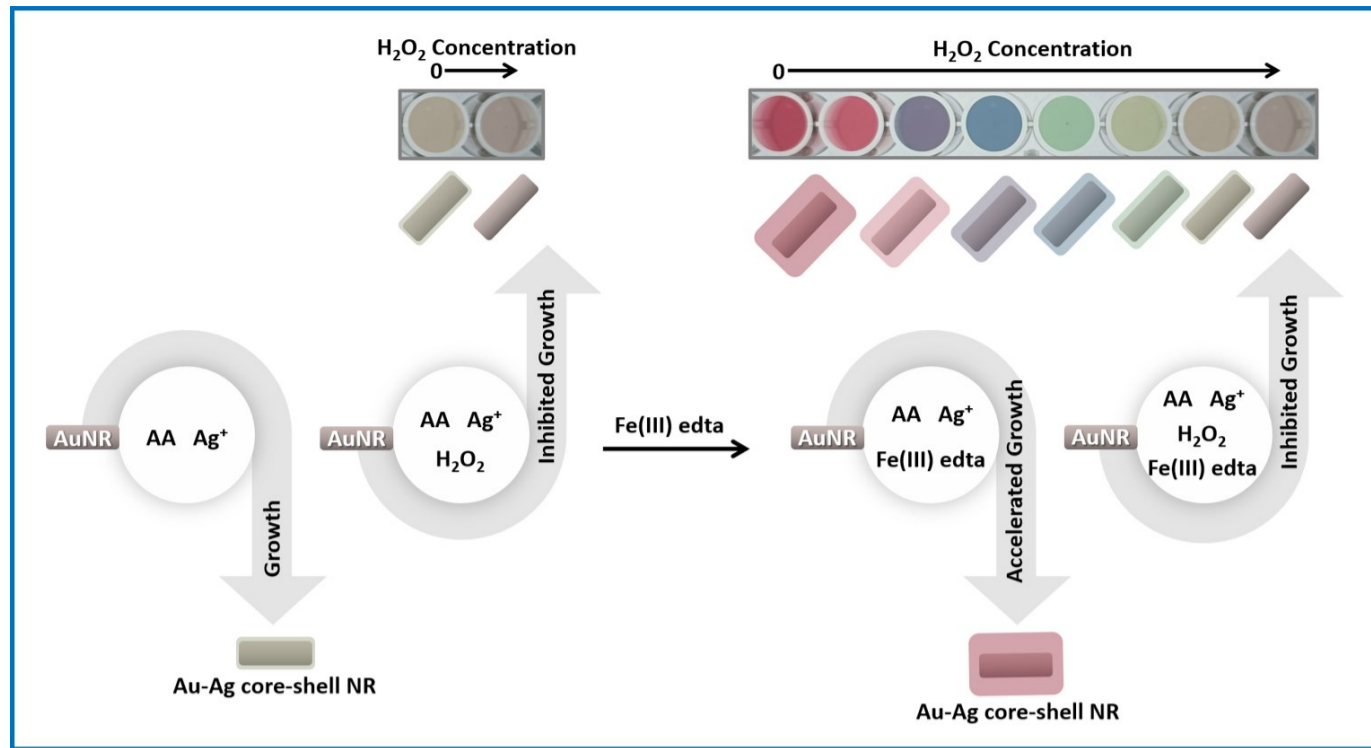
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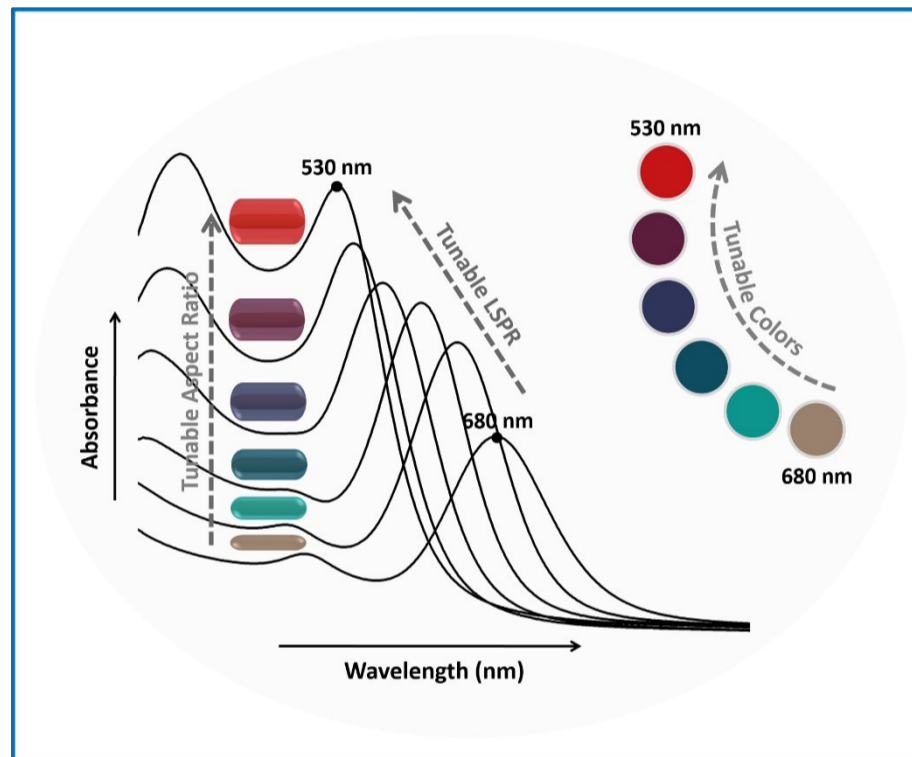
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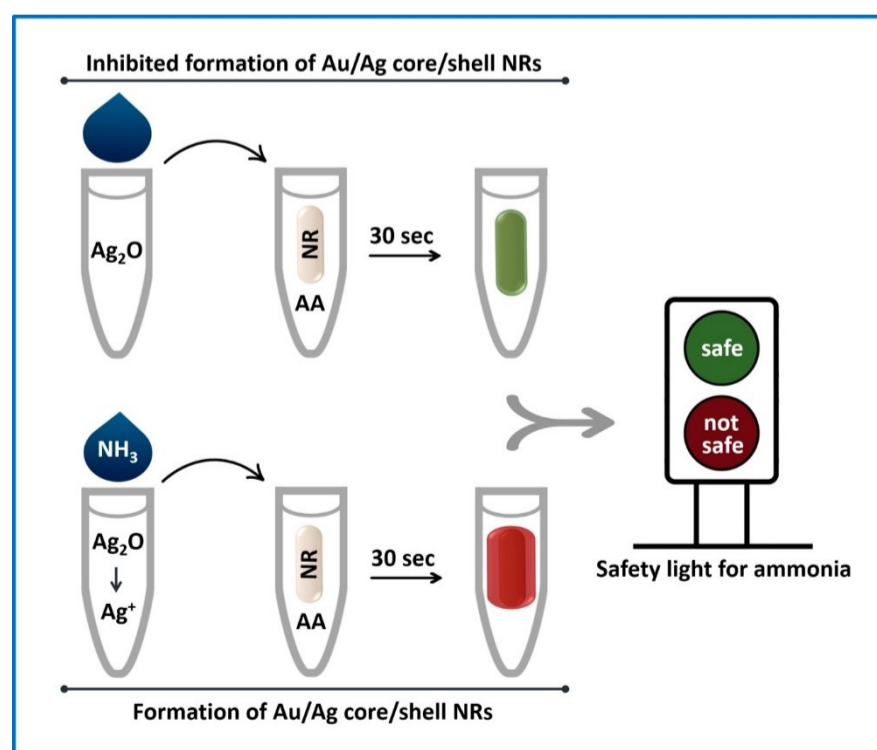
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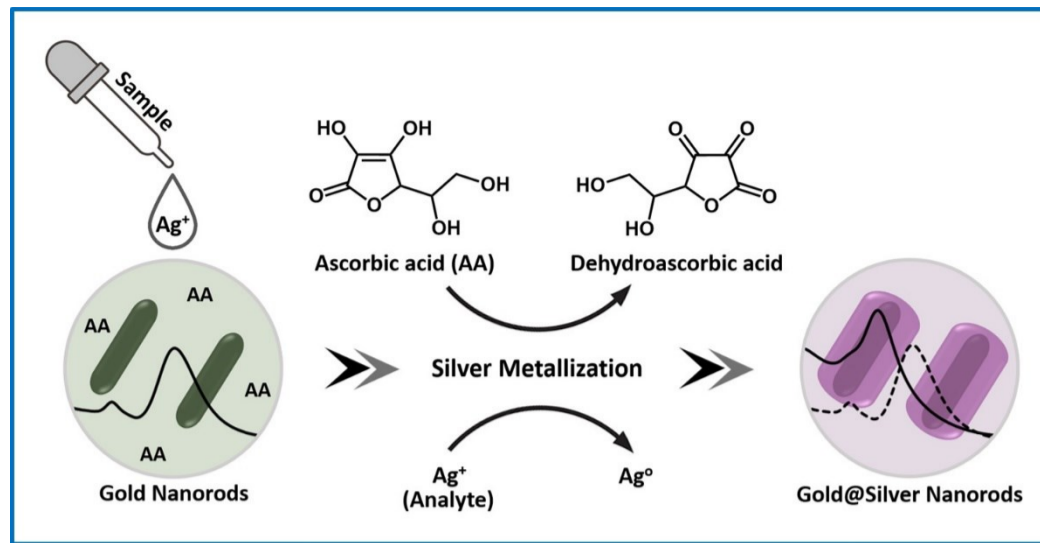
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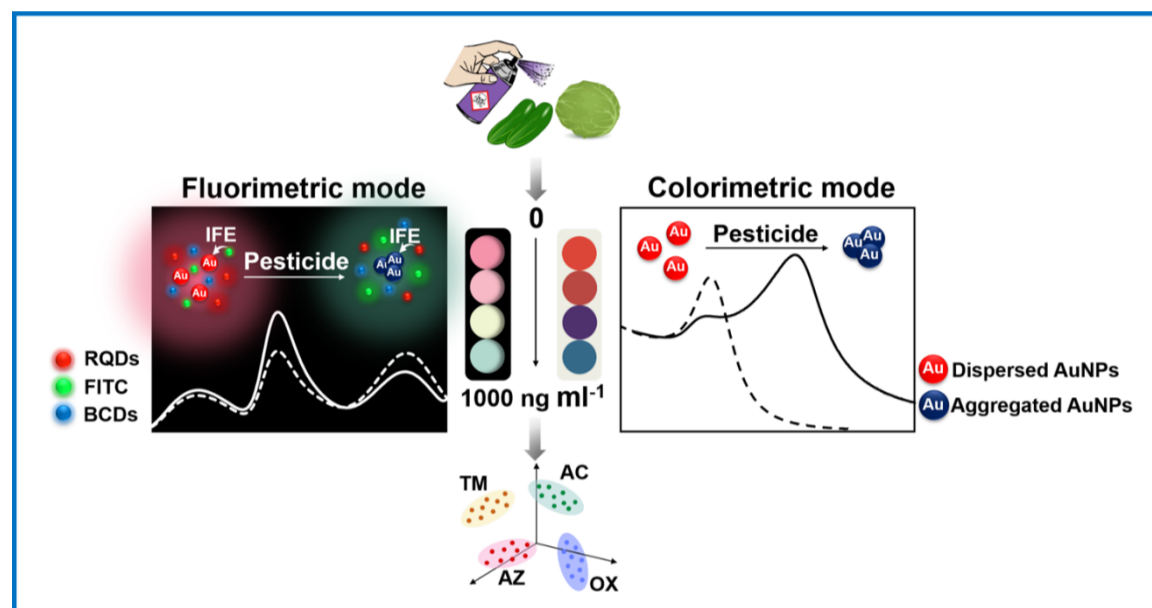
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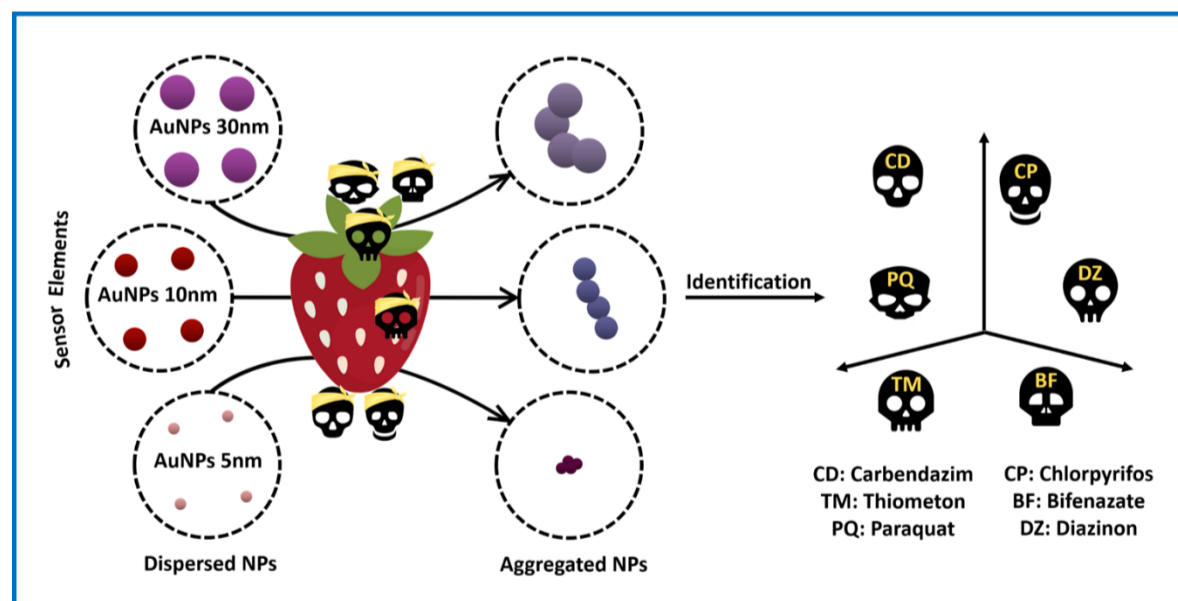
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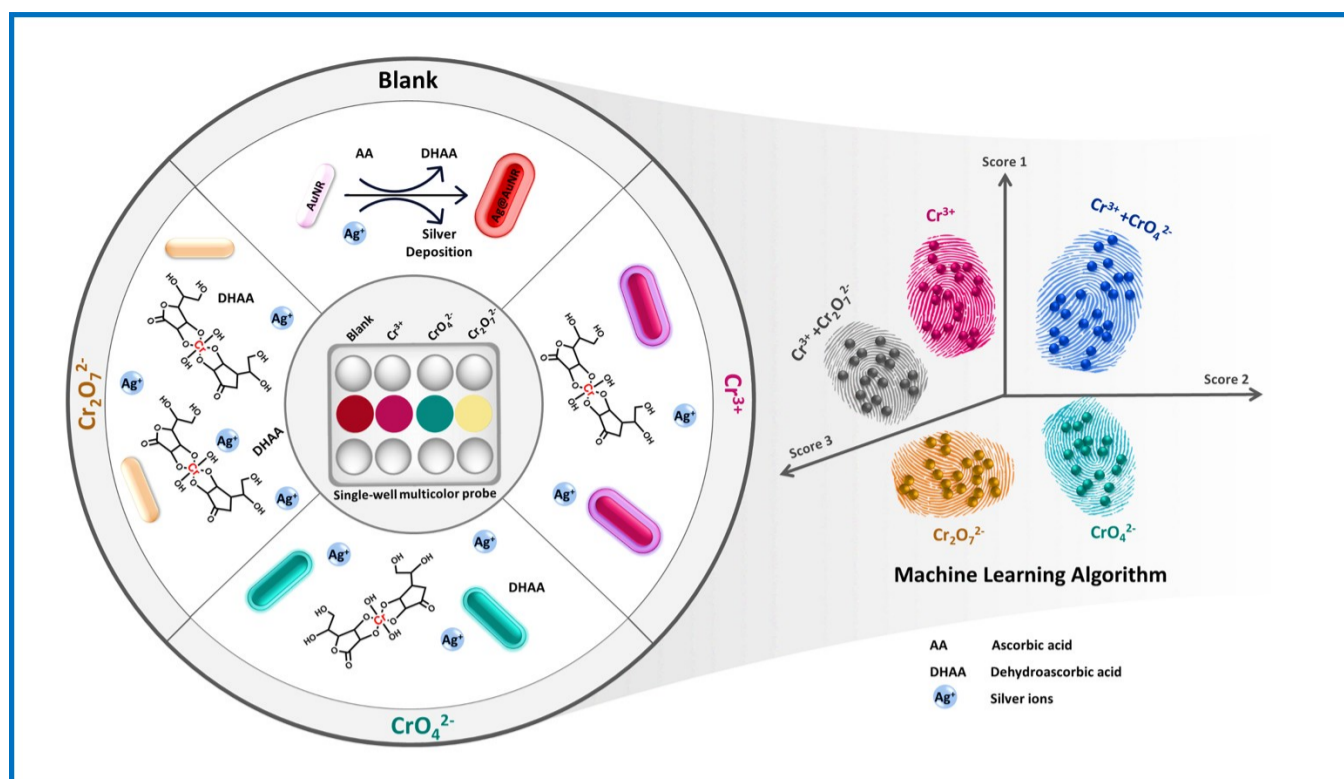
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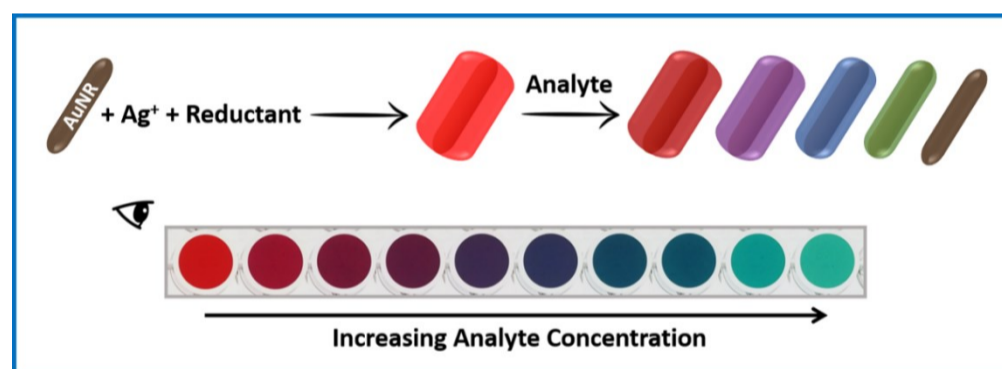
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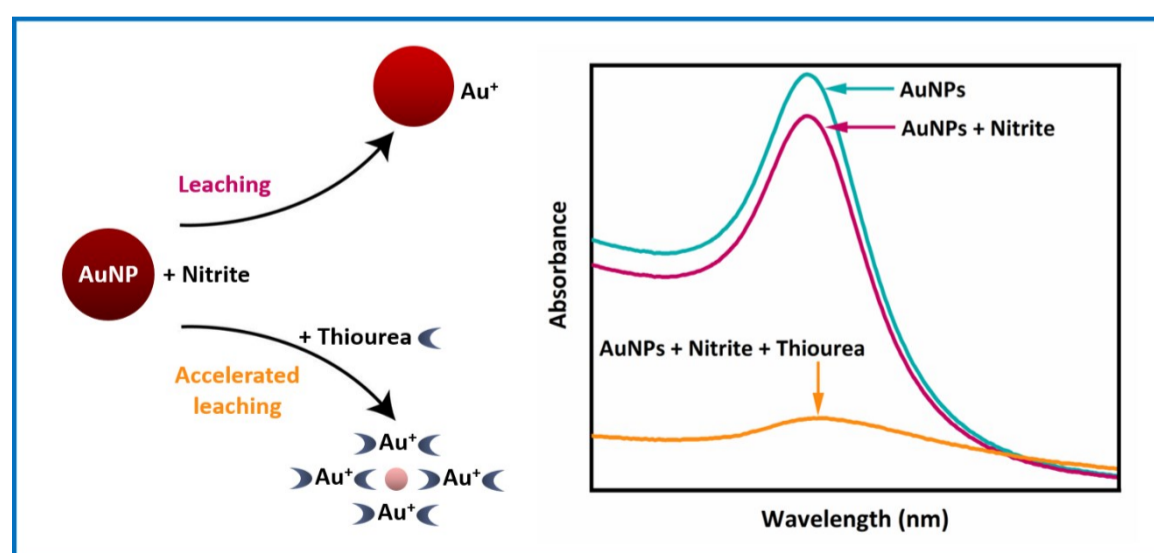
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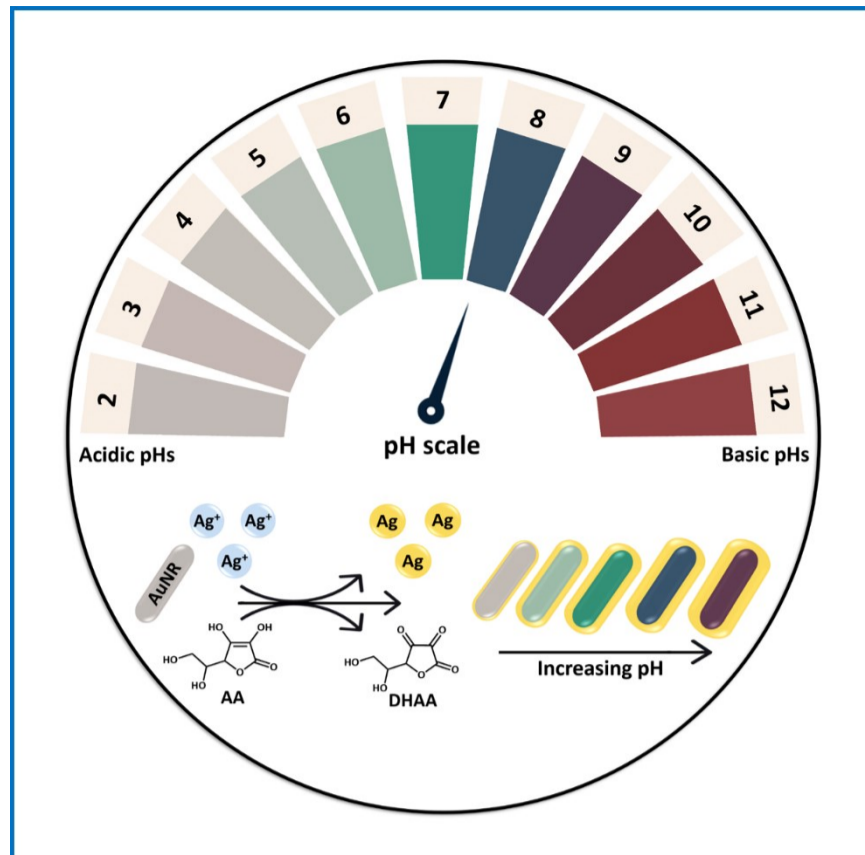
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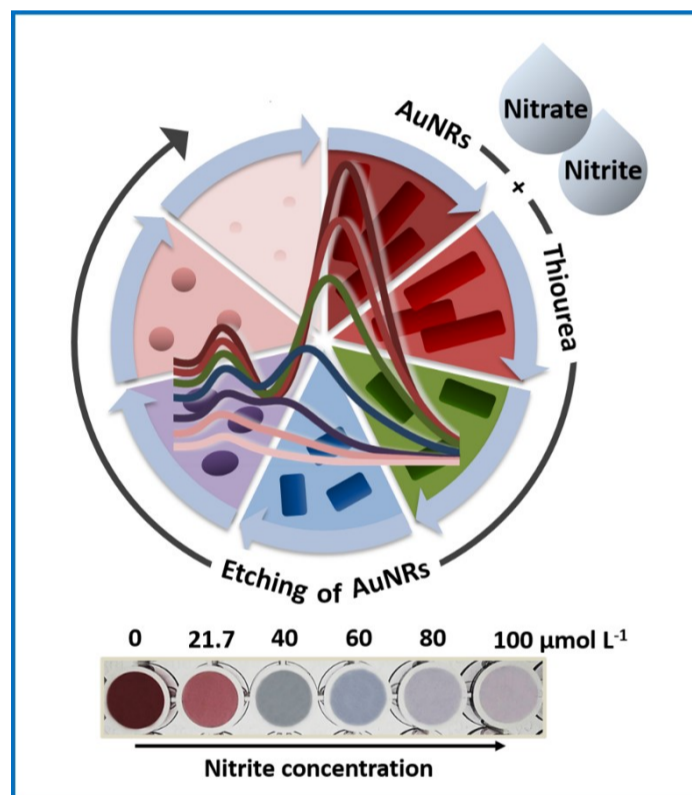
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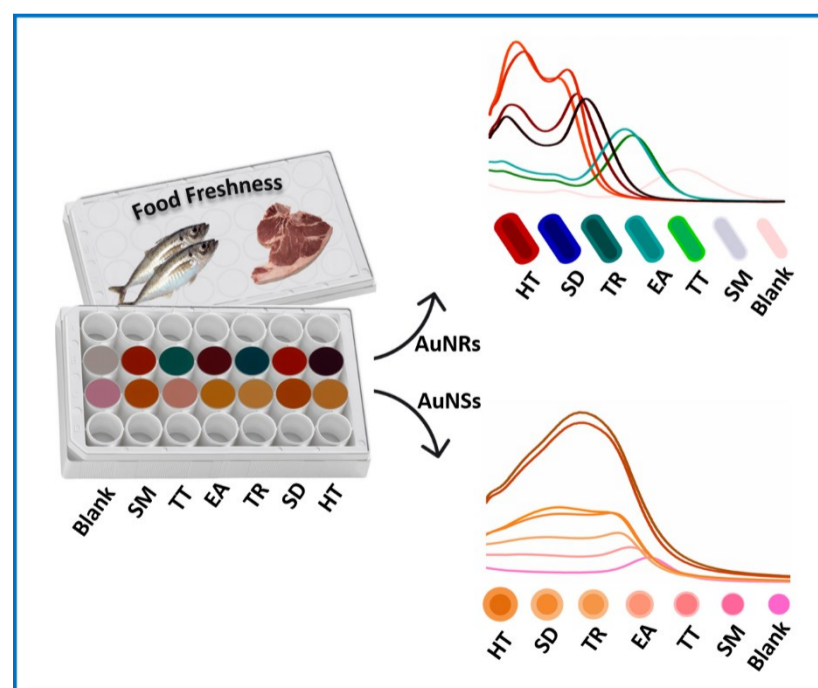
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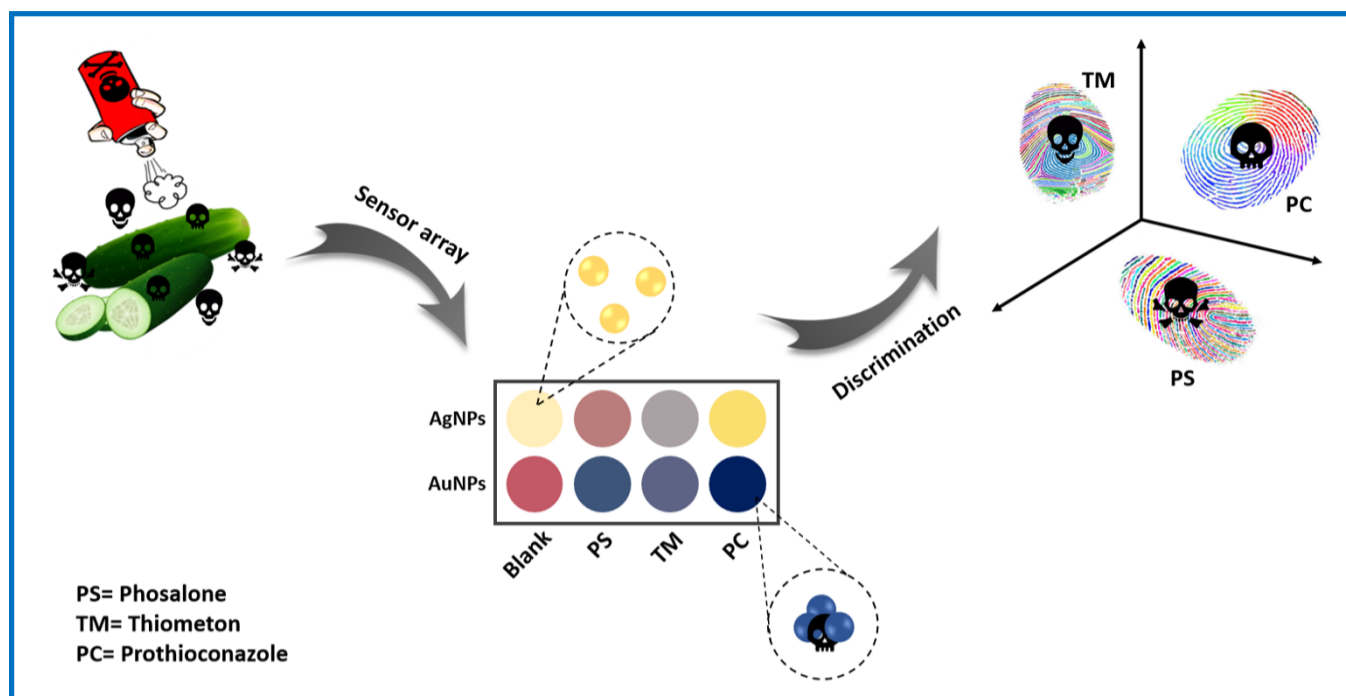
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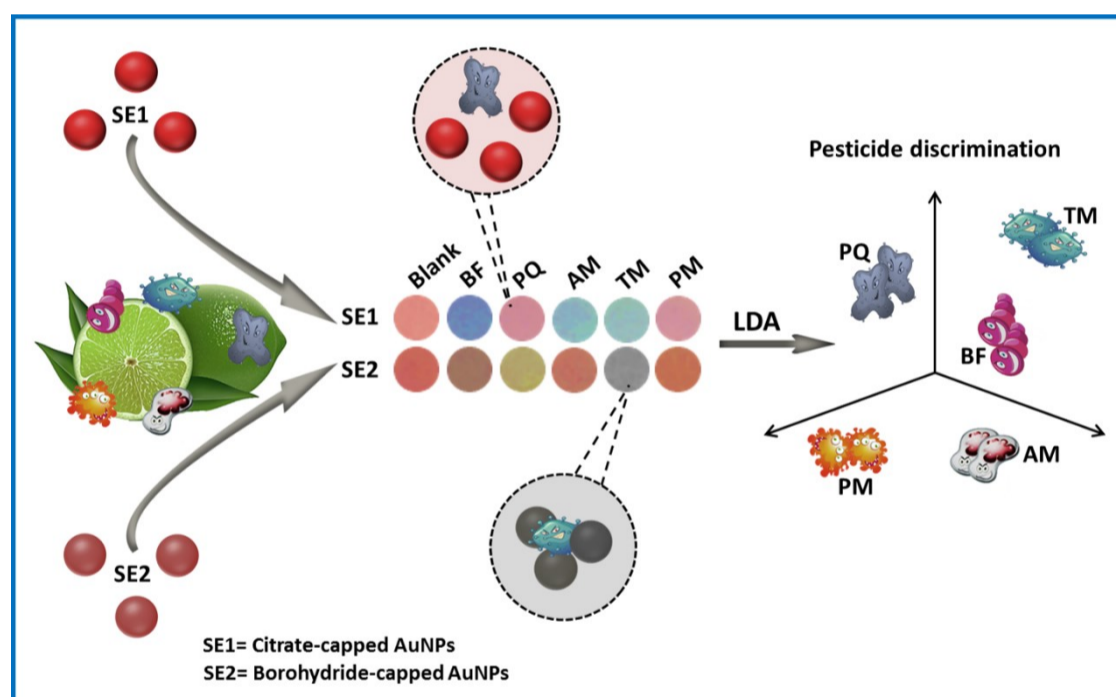
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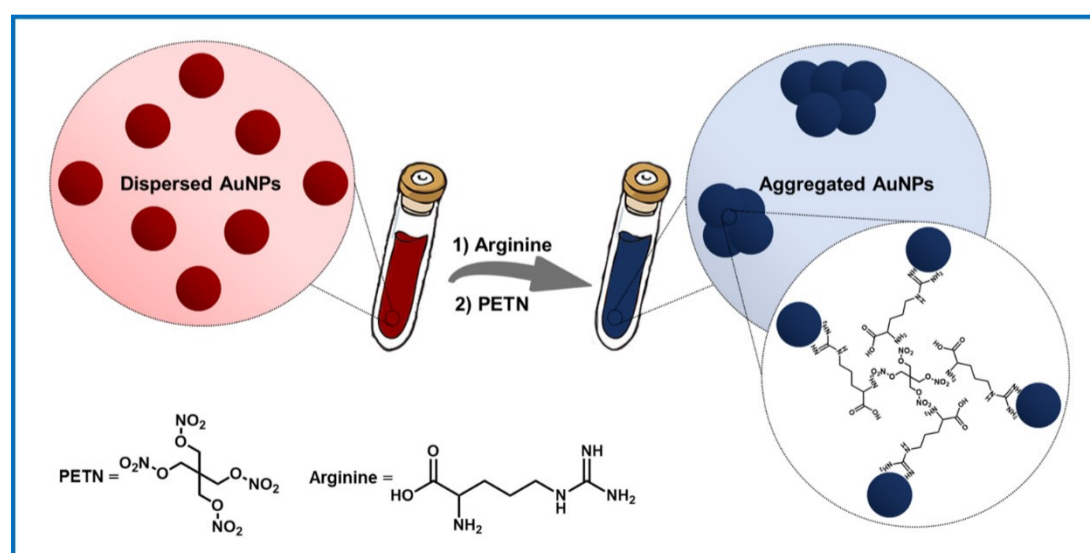
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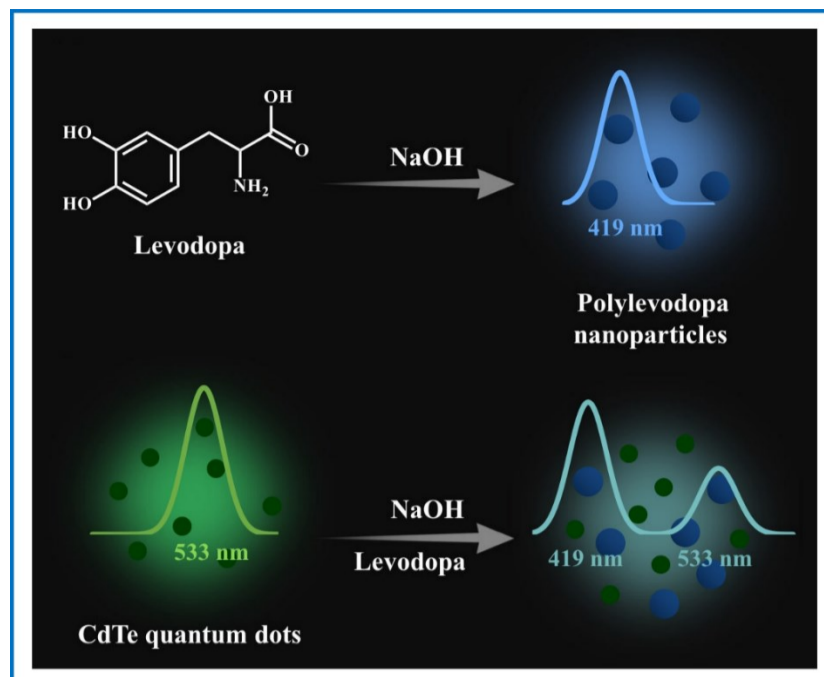
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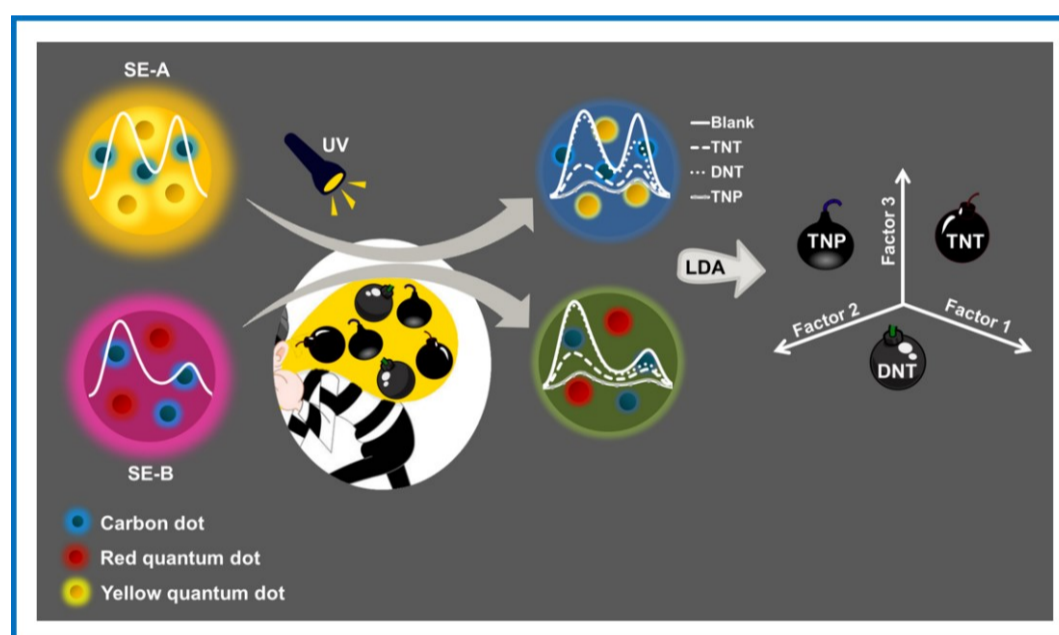
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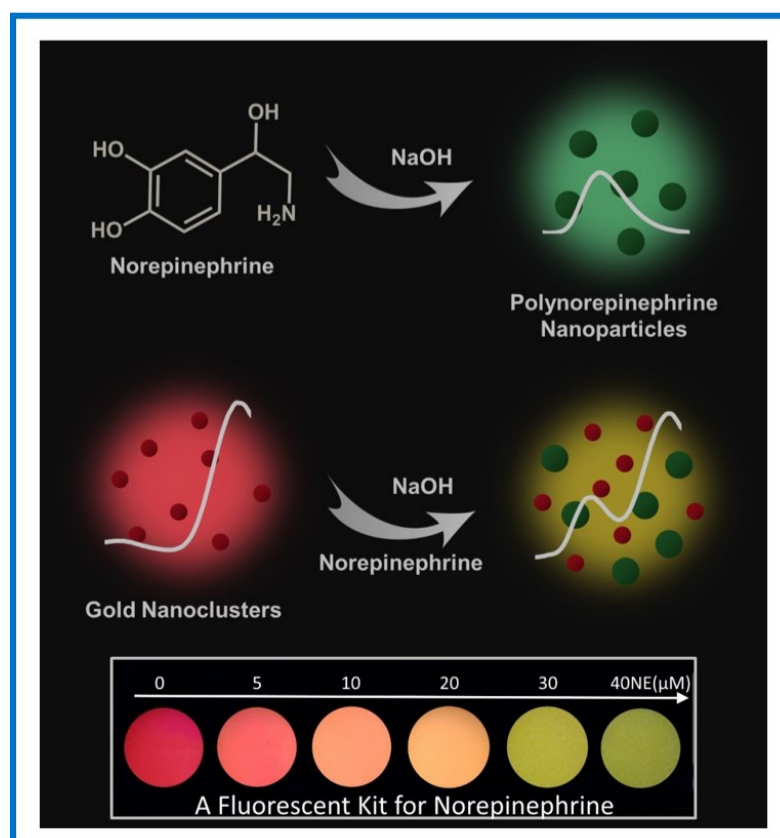
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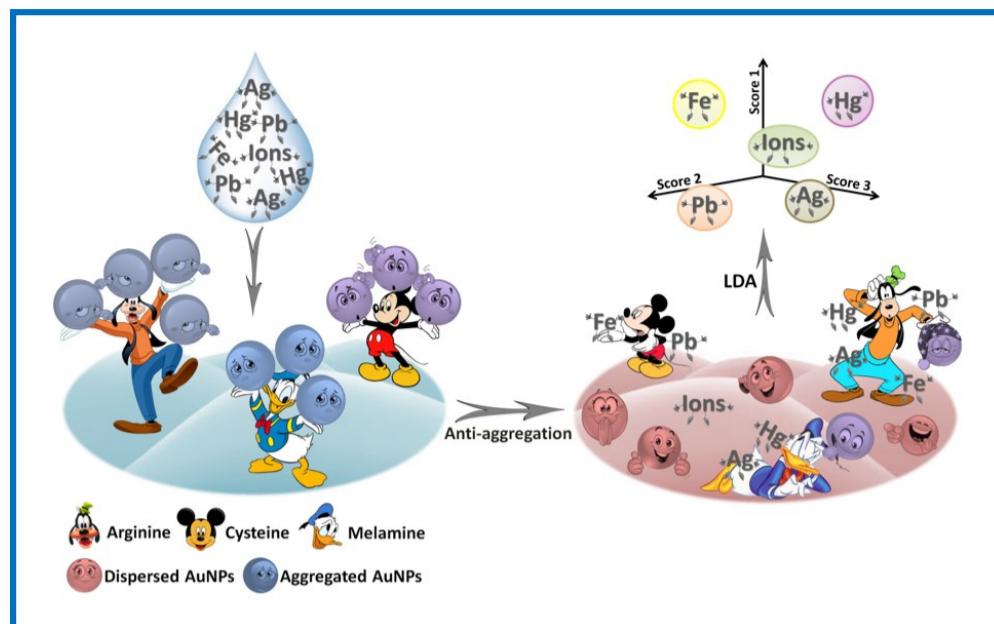
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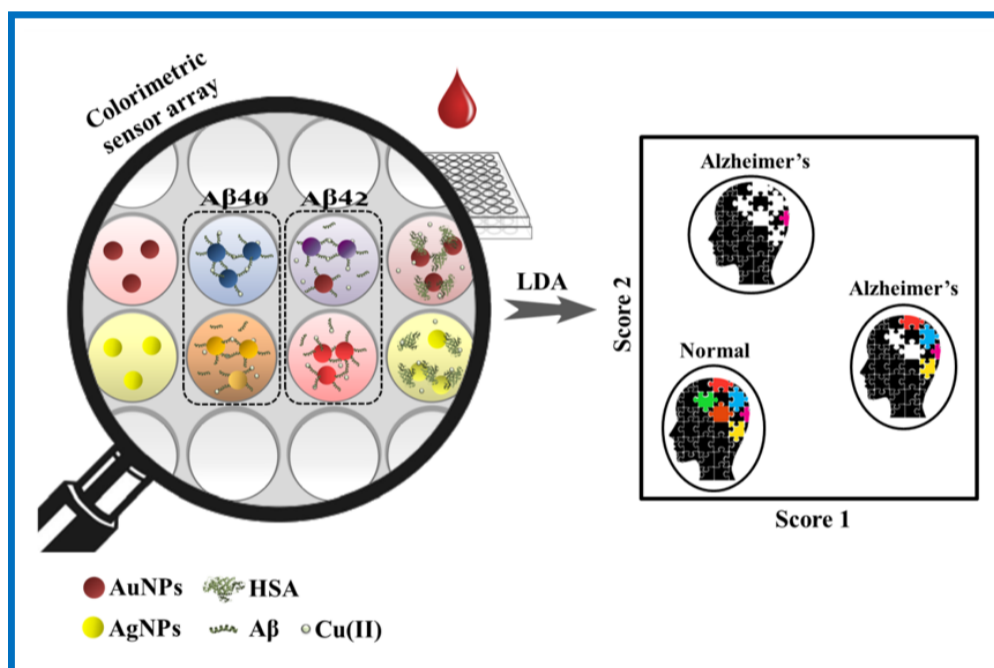
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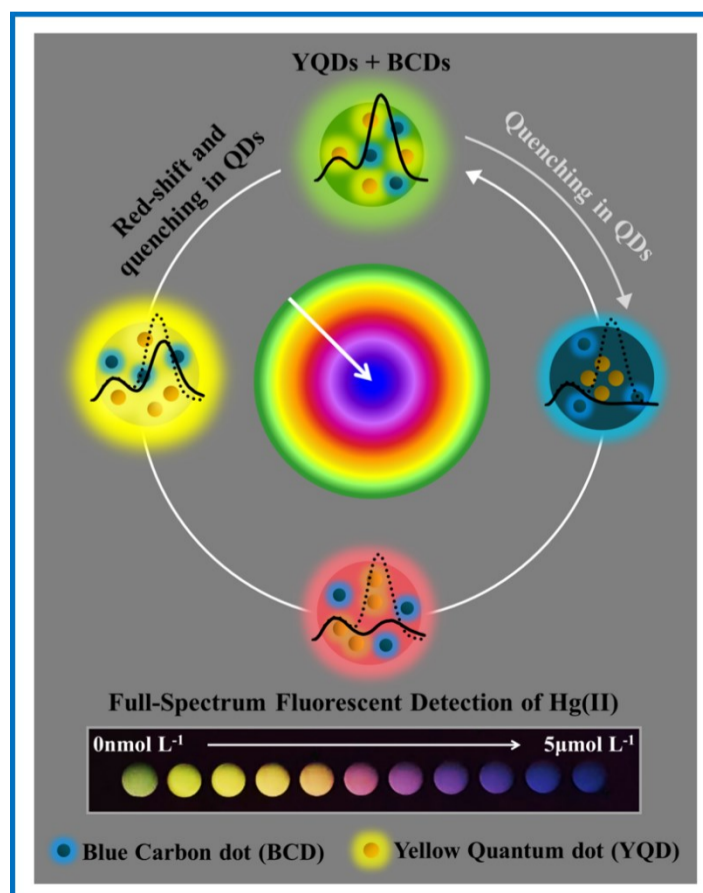
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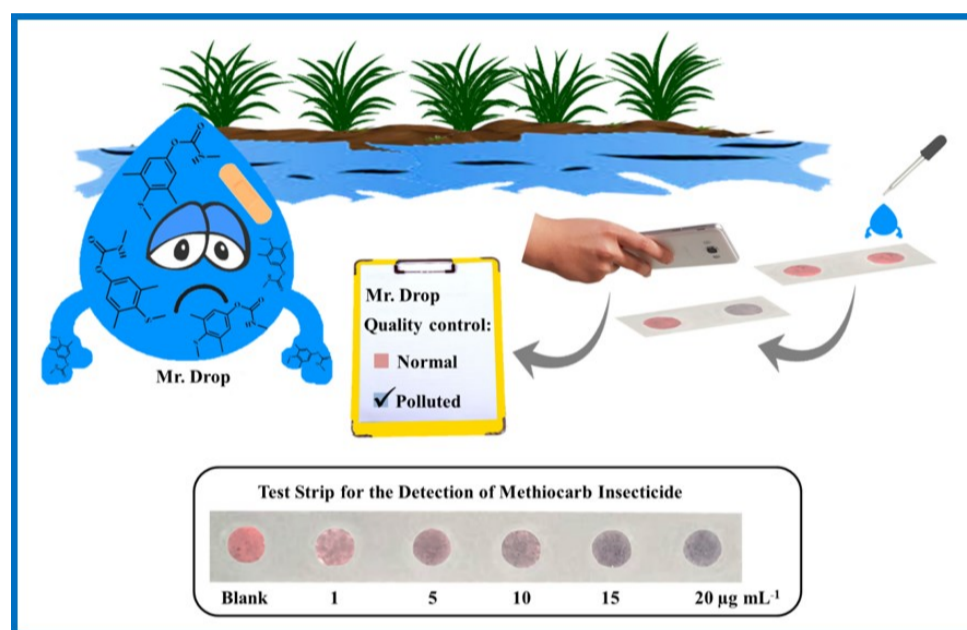
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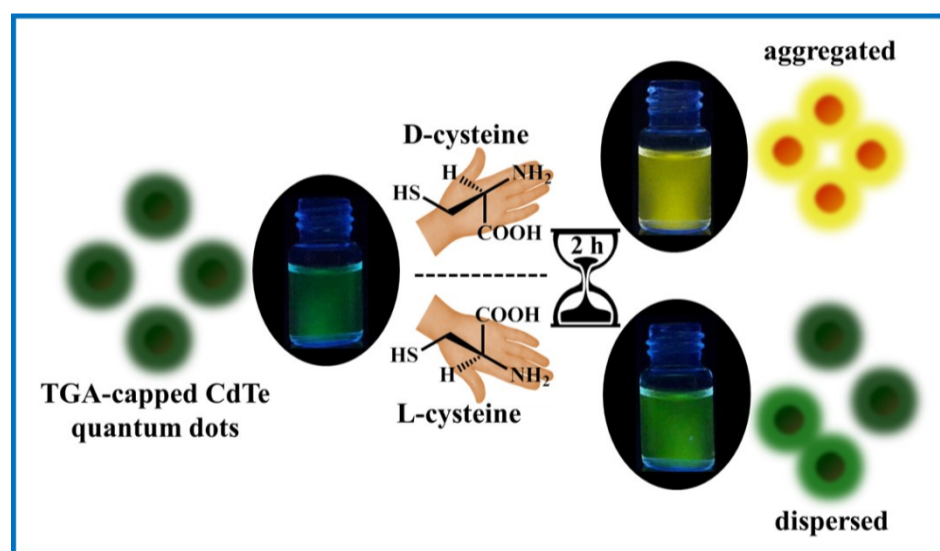
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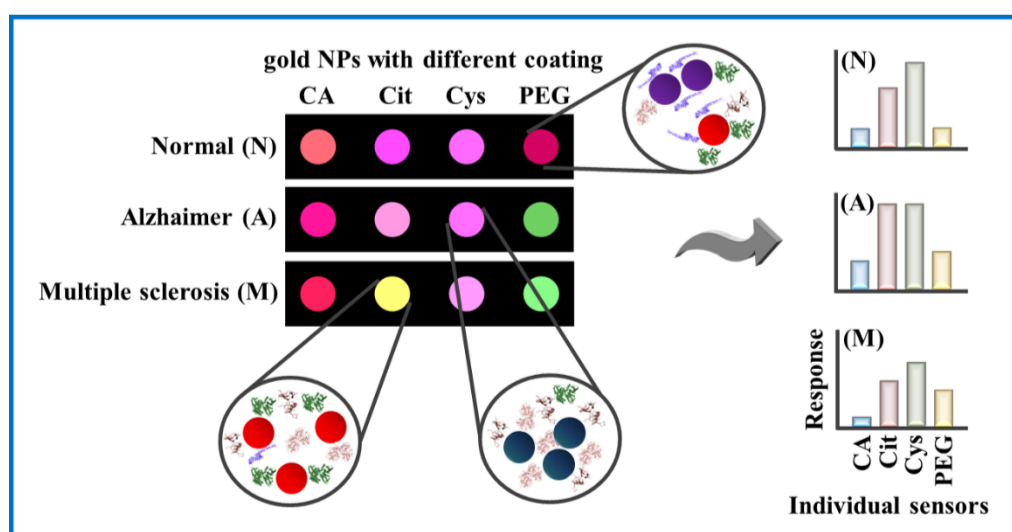
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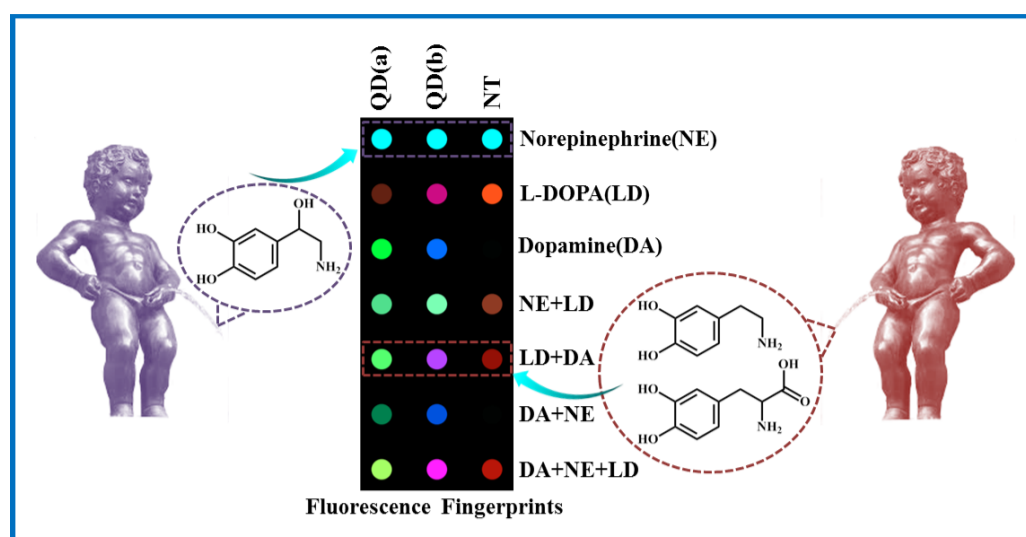
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- Visual detection of pentaerythritol tetranitrate (PETN) in aqueous solution based on aggregation of gold nanoparticles, Z. Taefi, F. Ghasemi, and M. R. Hormozi-Nezhad. The 26th Iranian Chemical Society Seminar of Analytical Chemistry, 2019.
- Nanoparticle-based optical sensors for naked-eye detection, Symposium of Biosensors and Nanobiosensors, F. Ghasemi. The 1st BIONA, Shahid Beheshti Student Scientific Association of Biotechnology, and Sharif Student Scientific Association of Nanoscience and Nanotechnology, 2019.
- Colorimetric sensor array based on plasmonic nanoparticles, M. R. Hormozi-Nezhad, and F. Ghasemi. The 7th International Conference on Nanoscience and Nanotechnology, 2018.
- F. Ghasemi, USERN Spring Conference, Tehran University of Medical Science, 2018.
- An optoelectronic tongue for simultaneous detection of β -Amyloid40 and β -Amyloid42, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 25th Iranian Chemical Society Seminar of Analytical Chemistry, 2018.
- Gold nanoparticle-based sensor array for detection and classification of metal ions, F. Najafzadeh, F. Ghasemi, and M. R. Hormozi-Nezhad. The 7th International Conference on Nanostructures, 2018.
- Design of fluorescent ratiometric probe for detection of Hg(II) ions, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 7th International Conference on Nanostructures, 2018.
- Visual enantioselective recognition of aminoacids based on unmodified CdTe quantum dots, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 24th Iranian Chemical Society Seminar of Analytical Chemistry, 2017.
- Label-free colorimetric detection of methiocarb insecticid based on aggregation of gold nanoparticles, A. A. Mohammadi, F. Ghasemi, and M. R. Hormozi-Nezhad. The 19th Iranian Chemistry Congress, 2017.
- Array-based sensing of catecholamine neurotransmitters using optical property of alkali-oxidized catecholamines, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 23th Iranian Seminar of Analytical Chemistry, 2016.
- Array-based detection of glutathione and glutathione disulfide in human serum plasma, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 6th International Conference on Nanostructures, 2016.
- Detection and classification of gold nanoparticles with different size and shape using a simple colorimetric sensor array, F. Ghasemi, M. R. Hormozi-Nezhad, S. Mirsadeghi, and M. Mahmoudi. The 21th Iranian Analytical Chemistry Conference, 2015.
- Determination of protein adsorption profile at the surface of magnetic nanoparticles using gel electrophoresis, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 19th Iranian Seminar of Analytical Chemistry, 2013.

- Large-scale synthesis of narrow-sized magnetite nanorods, F. Ghasemi, M. R. Hormozi-Nezhad, and M. Mahmoudi. The 14th Iranian Inorganic Chemistry Conference, 2012.

Oral presentations, Invited talks and Plenary lectures

- Nanosensors and their application in the detection of pesticides and pathogens, Collaborative meetings on the application of nanopesticides, Iranian Research Institute of Plant Protection, 2024.
- Nanosensors in agriculture, The workshop on nanomonitoring and nanoremediation in agriculture and natural resources, Imam Khomeini Higher Education Center, 2023.
- Nanoplasmonic sensor arrays, The 4th Digital Congress on Nanobiotechnology and Bioengineering (4th CDNB), 2023.
- Optical Nano(Bio)Sensors, The workshop on sensors and biosensors: Introduction, design principles and application in agriculture, Agricultural Biotechnology Research Institute of Iran, 2023.
- Nanoplasmonic sensor arrays: Principles and applications, The 21st International Conference on Nanotechnology, Switzerland, 2022.
- Colorimetric sensor based on oxidation of gold nanoparticles for nitrite and nitrate detection, Scientific lectures, Agricultural Biotechnology Research Institute of Iran, 2021.
- Multicolorimetric probe based on gold nanorods for nitrite and nitrate detection, Iran-Philippines International Virtual Symposium on Agricultural Nanotechnology, 2021.
- Sensors and citizens' health/hygiene, Agricultural Biotechnology Research Institute of Iran, The Fajr decade, 2021.
- Colorimetric nanosensors: Principles and applications in agriculture, Agricultural Biotechnology Research Institute of Iran, Research week, 2020.
- Nanoparticle-Based Optical Sensors: Principles & Applications in Agriculture, Agricultural Biotechnology Course, National School of Biotechnology and Agricultural Biotechnology Research Institute of Iran, 2020.
- Introduction to nano(bio) sensors in agriculture, Theoretical and practical workshop on nano(bio) sensors in agriculture, Agricultural Biotechnology Research Institute of Iran, 2020.
- Nanoparticle-based optical sensors for naked-eye detection, The workshop on Nanotechnology in Agriculture: Nano(bio)pesticides, Nanofertilizers and Nanosensors, Agricultural Biotechnology Research Institute of Iran, 2019.
- Nanoparticle-based optical sensors for naked-eye detection, Symposium of Biosensors and Nanobiosensors, The 1st BIONA, Shahid Beheshti Student Scientific Association of Biotechnology, and Sharif Student Scientific Association of Nanoscience and Nanotechnology, 2019.
- An optoelectronic tongue for simultaneous detection of β -Amyloid40 and β -Amyloid42, The 25th Iranian Seminar of Analytical Chemistry, 2018.
- Design of fluorescent ratiometric probe for detection of Hg(II) ions, The 7th International Conference on Nanostructures, 2018.
- Array-based sensing of catecholamine neurotransmitters using optical property of alkali-oxidized catecholamines, The 23th Iranian Seminar of Analytical Chemistry, 2016.
- Principles and application of UV-Vis spectroscopy in nanomaterials analysis, The 8th Nanotechnology Festival and Exhibition, 2015.
- Introduction and applications of upconversion nanoparticles, Sharif University of Technology, 2015.

Activities

- Holding a one-month training course for Venezuelan researchers, Agricultural Biotechnology Research Institute of Iran, 2025.
- Member of the organizing committee of the third New Agricultural Technologies Event, Agricultural Biotechnology Research Institute of Iran, 2025.
- Holding a one-month training course for Venezuelan researchers, Agricultural Biotechnology Research Institute of Iran, 2024.
- Member of the organizing committee of the 2nd Expert Group Meeting on ECO Agricultural Biotechnology Network, Agricultural Biotechnology Research Institute of Iran, 2023.
- Member of the organizing committee of the Workshop on Genetically Modified Organisms (GMOs) Biosafety and Regulation, Agricultural Biotechnology Research Institute of Iran, 2023.
- Holding a one-month training course for Uzbek researchers, Agricultural Biotechnology Research Institute of Iran, 2023.
- Member of the organizing committee of the second New Agricultural Technologies Event, Agricultural Biotechnology Research Institute of Iran and Biotechnology Development Council, 2023.
- Holding the workshop on sensors and biosensors: Introduction, design principles and application in agriculture, Agricultural Biotechnology Research Institute of Iran, 2023.
- Member of the organizing committee of the first New Agricultural Technologies Event, Agricultural Biotechnology Research Institute of Iran and Biotechnology Development Council, 2022.
- Member of the Nanotechnology in Smart Agriculture Committee, Alborz province, 2022-Present.
- Member of the organizing committee of the Iran-Philippines International Virtual Symposium on Agricultural Nanotechnology, 2021.
- Referee and assessor of the Biotechnological Ideas Competition, University of Kharazmi, 2021.
- Member of the Public Relations Committee, Agricultural Biotechnology Research Institute of Iran, 2020.
- Executive chair of the Agricultural Biotechnology Course, National School of Biotechnology and Agricultural Biotechnology Research Institute of Iran, 2020.
- Member of the organizing committee of the workshop on Introduction to Nano (biosensors) in Agriculture, Agricultural Biotechnology Research Institute of Iran, 2020.
- Member of jury committee and referee of the 3rd International & 11th National Biotechnology Congress of Islamic Republic of Iran, 2019.
- Referee of the Festival of Top Agricultural Ideas, Agricultural Research, Education, and Extension Organization (AREEO), 2019.
- Member of the organizing committee of the workshop on Nanotechnology in Agriculture: Nano(bio)pesticides, Nanofertilizers and Nanosensors, Agricultural Biotechnology Research Institute of Iran, 2019.
- Member of the organizing committee of the 7th International Conference on Nanostructures (ICNS7), Sharif University of Technology, 2018.
- Member of the organizing committee of the 23th Iranian Seminar of Analytical Chemistry, Sharif University of Technology, 2016.

- Reviewer for international journals including: Sensors and Actuators B: Chemical, Journal of Materials Science, RSC Advances, Analytical Chemistry, ACS Sustainable Chemistry & Engineering, Analytica Chimica Acta, Biosensors and Bioelectronics, Journal of Hazardous Materials, ACS Sensors, ACS Applied Materials and Interfaces, Microchemical Journal, Journal of Photochemistry and Photobiology A: Chemistry, Journal of Pharmaceutical and Biomedical Analysis, Plasmonics, IEEE Sensors Journal, Talanta, ACS Applied Nano Materials, Chemical Engineering Journal, Analytical Chemistry Letters, Frontiers in Bioengineering and Biotechnology, Applied Food Research, Microchimica Acta, Scientia Iranica, Journal of Materials Science, Journal of Biosafety, Scientific Reports, Iranian journal of Genetics and Plant Breeding, and Advanced Science

Supervision and Advising of PhD and MS Thesis

- Zahra Hatami, MS student of Tehran University, Thesis title: Carbon-based nanoparticles synthesized from agricultural waste in mitigating the effects of drought stress on the efficiency of plant growth-promoting bacteria in maize, 2026
- Rahele Bagheri, MS student of Tehran University, Thesis title: Design and fabrication of biopolymer-based tablets for the development of a stable colorimetric nanokit for ammonia detection in recirculating aquaculture systems, 2026
- Paria Allahverdi, MS student of Tehran University, Thesis title: Design of a colorimetric nanosensor for detection of *Pseudomonas tolaasii*, the causative agent of brown blotch disease in edible mushroom, 2025.
- Seyyed Hossein Hashemi Najafabadi, MS student of Kharazmi University, Thesis title: Aflatoxin M1 tracking using aptamer probe engineering based on genetic algorithm and colorimetric assessment using gold nanoparticles, 2024.
- Sobhan Soleimani, MS student of University of Kharazmi, Thesis title: Design of a colorimetric sensor based on synthesis of Au@Ag core-shell nanoparticles for Salmonella bacteria detection, 2023.
- Marjan Koushkestani, PhD student of Sharif University of Technology, Thesis title: Developing multi-channel sensor arrays for detection and discrimination of important biological compounds and environmental pollutants, 2022.
- Elaheh Ghorbanian, MS student of Tehran University, Thesis title: Designing of a colorimetric nanosensor based on plasmonic nanoparticles for detection and quantification of ammonia concentration in aquatics recycle aquaculture system (RAS), 2021.
- Masoumeh Abdali, MS student of Tehran University, Thesis title: Design of a colorimetric sensor array to monitor pesticide residues in strawberry fruit, culture medium and drainage water during the cultivation process, 2021.
- Afsaneh Orouji, PhD student of Sharif University of Technology, Thesis title: Design of Optical Sensor Arrays Based on Plasmonic Nanostructures for Food Quality Control, 2021.
- Sam Hosseinniya, MS student of Tehran University, Thesis title: Fabrication and evaluation of optical nanobiosensor based on localized surface plasmon resonance (LSPR) gold nanorod for detection of CRP biomarker in sepsis, 2020.
- Marzieh Sepahvand, PhD student of Tehran University, Thesis title: Development of a colorimetric method based on gold nanoparticles in measurement of nitrite and nitrate in aqueous environments and soil solution, 2020.
- Marjan Koushkestani, MS student of Sharif University of Technology, Thesis title: Design of a colorimetric sensor array based on aggregation of plasmonic nanoparticles for detection and discrimination of phosalone, thiometon and prothioconazole pesticides, 2020.
- M. Reza Mirghafouri, MS student of Sharif University of Technology, Thesis title: Design of a colorimetric sensor array based on aggregation of gold nanoparticles for identification and discrimination of pesticides, 2020.

Languages

- Persian (mother tongue)
- English