**Investigation Background - Nanotechnology**

A term coined and popularized by Eric Drexler.

A set of tools, techniques and methodologies for manipulating the structure and composition of materials on a nanoscale.

**Nanodiagnostics** - a term coined and popularized by Eric Drexler.

The fabrication of devices within that size range.

Nanotechnology is the application of that investigation background in the field of medicine.

**Objective of this Research**

1. To obtain a uniform composite of Au and DNA.
2. To characterize the new nanoscale device to allow the targeting of disease at a diagnostic scale.

**Experimental Procedure**

- Preparation of reducing agent
- Injection into solution
- Dilution of HClAu solution
- Injection into AuCl solution
- Ascorbic solution

**Mechanism of the DNA modified Au particles**

The sol-gel process - a gelation process for making materials.

The main advantages - low temperature, versatility, flexible scale and tunability.

**Results and Discussion**

**The X-ray Powder Diffraction of Au Metal**

- Au particles have been identified.
- The increase in diffraction intensity causes the peak intensity to increase.

**The SEM Images of the Au & Au-DNA Hybrids**

- Nanoparticles are successfully dispersed.
- Gold nanoparticles have been identified.
- The broadened peak intensity indicates an increase in the size of the gold nanoparticles.

**The TEM and EDX Analysis of the Au Particles**

- Au nanoparticles are successfully dispersed.
- Gold nanoparticles have been identified.
- The broadened peak intensity indicates an increase in the size of the gold nanoparticles.

**RAm Spectroscopy of Au Particles**

- The increase in diffraction intensity causes the peak intensity to increase.

**Conclusion**

- Nanodiagnostics are successfully fabricated.
- Nanotechnology can offer diagnostic tools of better sensitivity, specificity, and reliability.
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**Future Work**

This research has potential impact on the prevention, early and reliable diagnosis of diseases.

**Acknowledgement**

The facilities and staff at Texas A&M University-Kingsville.

**References**

2. Watanabe et al. (2003), Current Opinion in Chemistry 4, 67-64.