Optical detection of Glycated Albumin

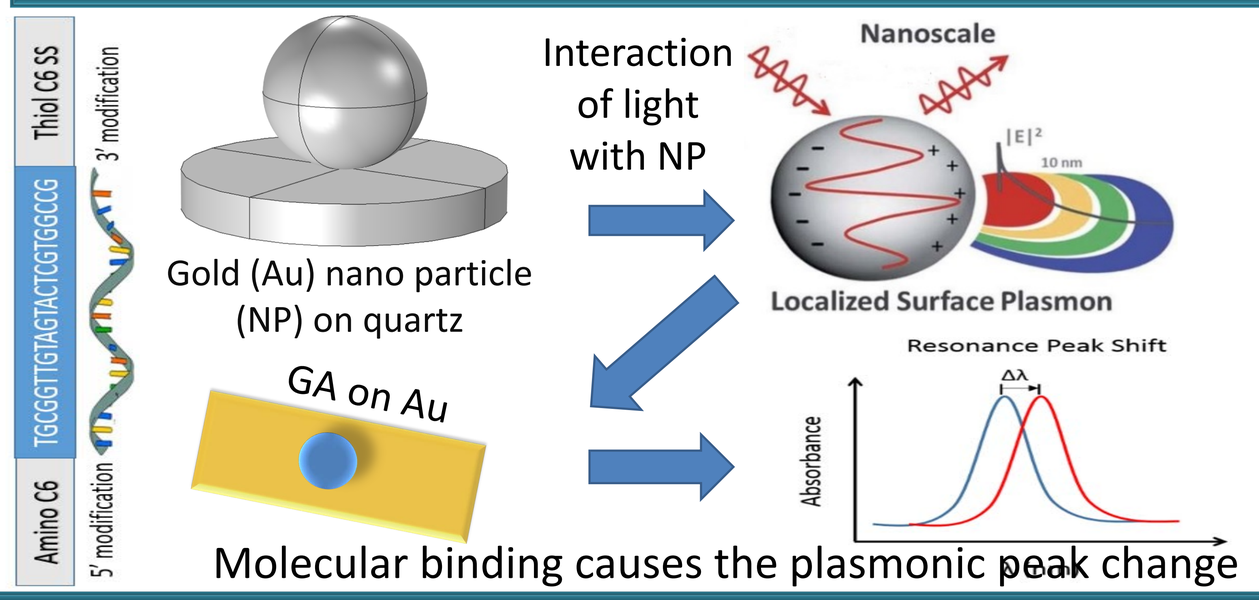
Himadri Shekhar Mondal[a], Krishnan Murugappan[b], Adam Damry[c], Colin Jackson[c], Antonio Tricoli[b], David Nisbet[a,]*

[a]Laboratory of Advanced Biomaterials,
[b]Nanotechnology Research Laboratory,
[c]Research School of Chemistry,
The Australian National University, Canberra 2601, Australia.
himadrishekhar.mondal@anu.edu.au

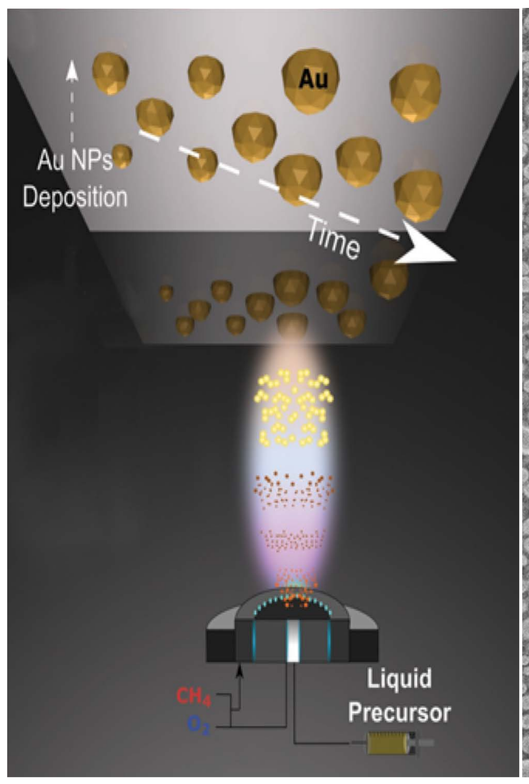
1. Background & aims

- Glycated albumin (GA), a biomarker for Diabetes.
- Provides the mean glucose level of past three weeks.
- Reliable comparing with Glycated hemoglobin and blood glucose in terms of treatment regime.

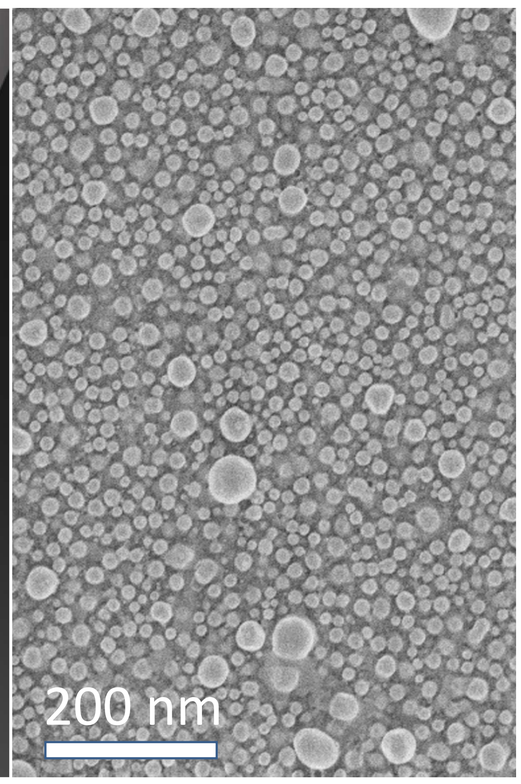
2. Sensing principle



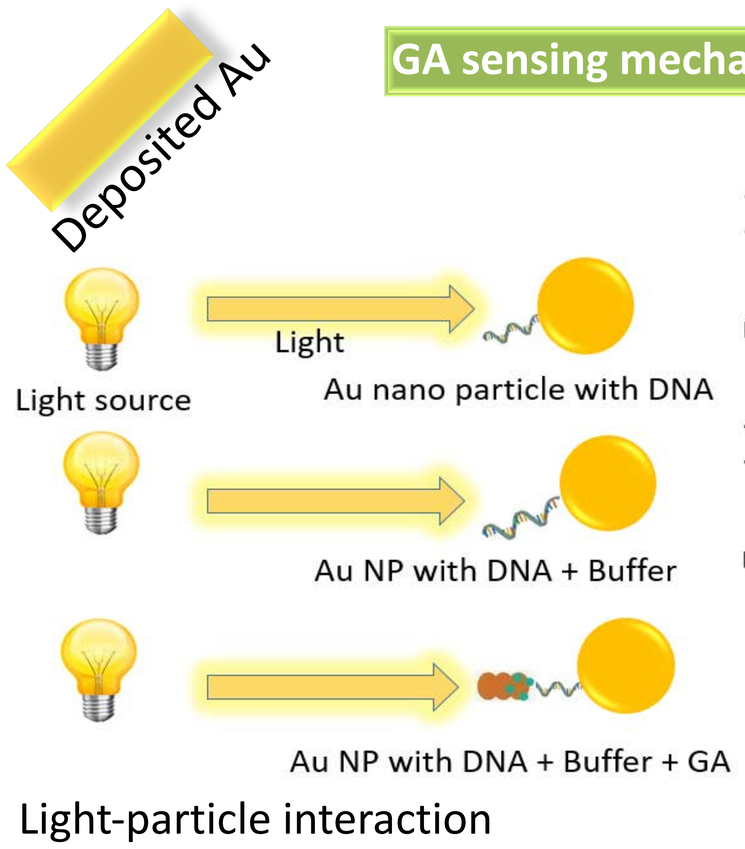
3. Material and methods



Gold deposition by Flame Spray Pyrolysis

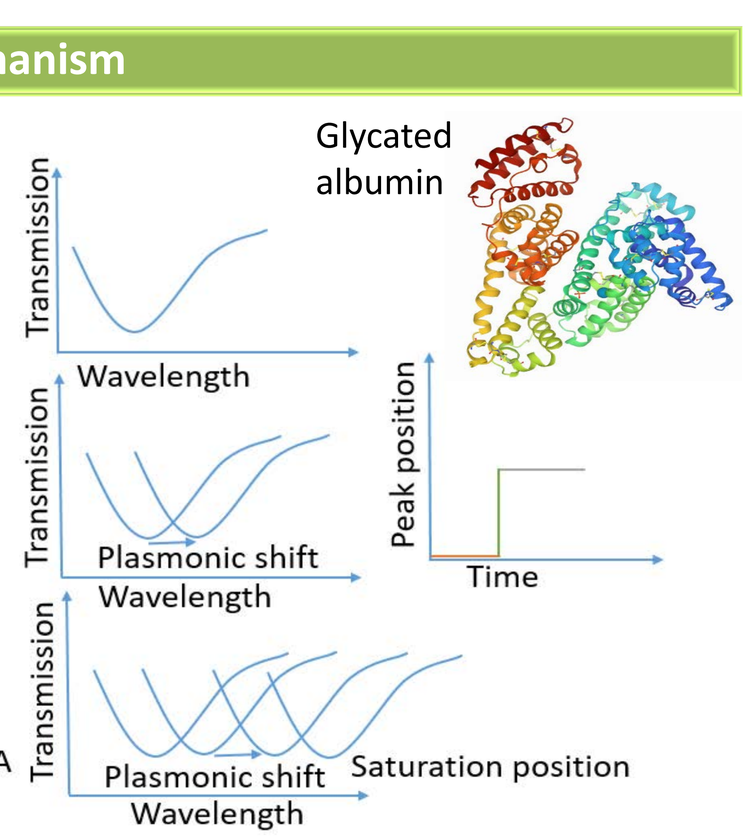


SEM image of deposited Au



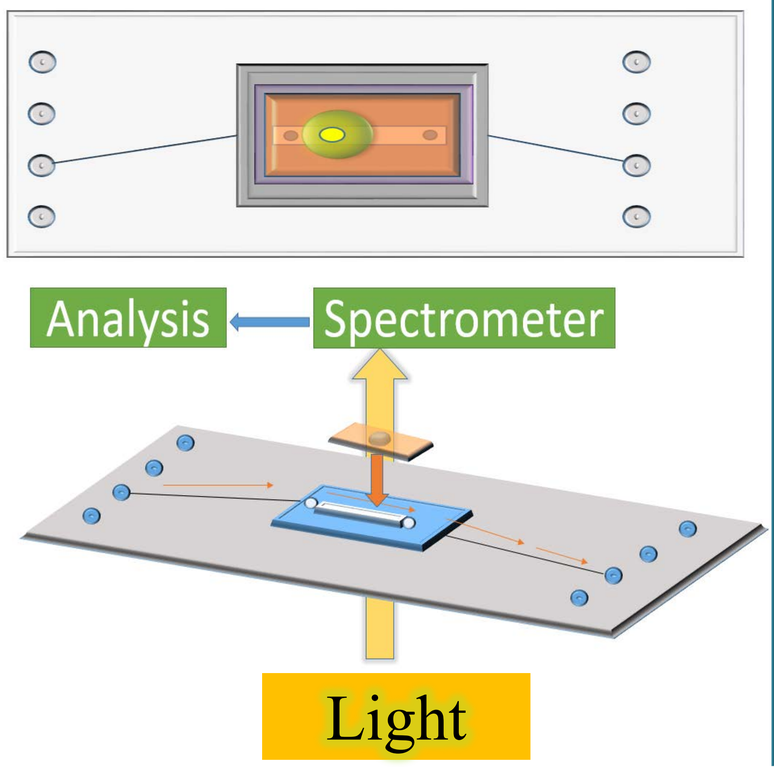
Light-particle interaction

GA sensing mechanism



Schematics shows the plasmonic peak changes due to molecular binding

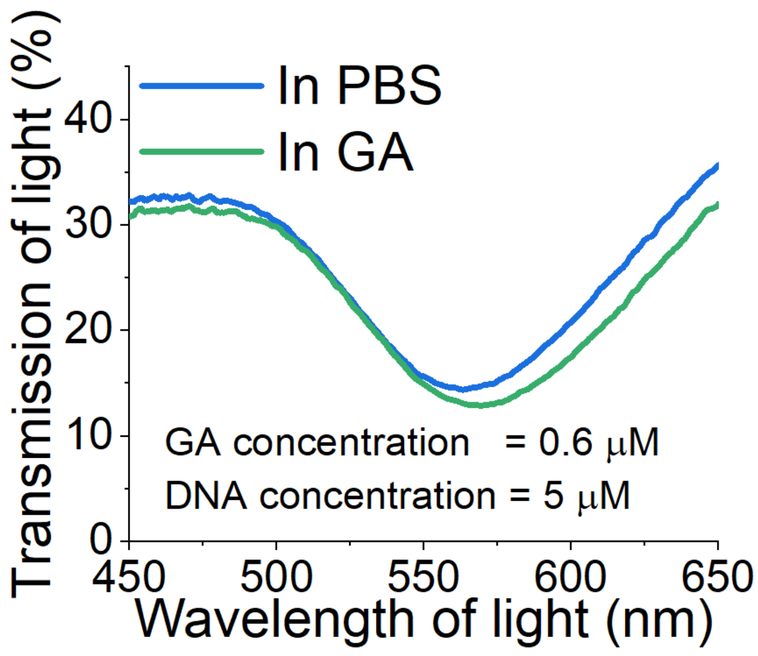
Synthesis of nanoparticles → **DNA Functionalization** → **GA Sensing**



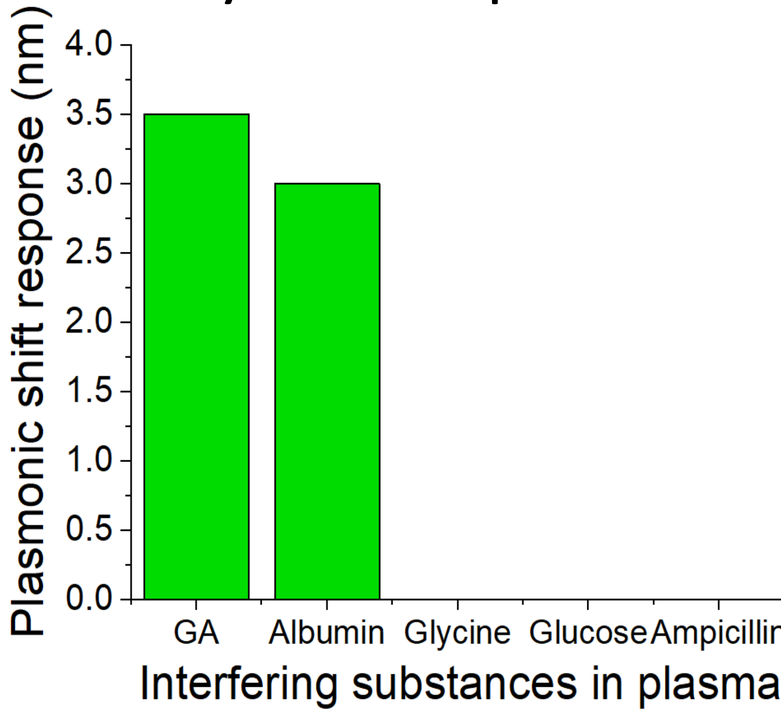
4. Design in microfluidic

5. Results

Plasmonic shift of GA



Specificity of the aptasensor



6. Conclusion

1. The sensor detection limit is in picomolar range.
2. Study is being carried out for improving the selectivity.

7. References

1. Ghosh et. al. (2017) *Nanotechnology*, *28*(43), 435505.
2. Fusco et. al. (2019) *Advanced Functional Materials*, *29*(2), 1806387.

8. Acknowledgement

This research was funded by and has been delivered in partnership with Our Health in Our Hands (OHIOH), a strategic initiative of the Australian National University.