**Plasmonic and Magnetic Nanoparticles for Biomedical Application**

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The development of new chemical methods for the next generation of nanoparticles with very high magnetic moment, fine tuning Au nanorods and novel hybrid and multifunctional nanostructure is presented.

Detailed mechanistic studies of their formation by sophisticated and advanced analysis of the nanostructure allows tuning of the physical properties at the nanoscale; these can subsequently be exploited for diagnosis and treatment of various diseases. The studies are conducted to provide insight for future material design approaches. It will also help to identify the critical process parameters that can be manipulated in order to obtain the suitable physical properties for the intended applications.

In collaboration with chemical engineers in designing the reactors in microfluidic systems, this allowed for the first time to detailed study the physical properties such as X-ray diffraction (XRD), magnetic moment and morphology to unravel the particle formation mechanism during co-precipitation synthesis of iron oxide magnetic nanoparticles, which is very important for their robust, reproducible formation process for cancer treatment.

 

***Figure 1.*** Schematic of the set-up for nanoparticle synthesis showing the syringe pumps used to feed reactants to a T-mixer, pre-heated water bath, and aging bath; and the synchrotron X-ray diffraction set-up showing the solution injected into a quartz capillary for analysis.

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 Professor Nguyen Thị Kim Thanh, FRSC, FInstP, FIMMM FRSB ([http://www.ntk-thanh.co.uk](https://eur01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.ntk-thanh.co.uk&data=02%7C01%7Cntk.thanh%40ucl.ac.uk%7C5ae8868220244d40be9208d6ef7c29a6%7C1faf88fea9984c5b93c9210a11d9a5c2%7C0%7C0%7C636959713896408053&sdata=EzQEGNqbb9iOgbqgXu32wx%2FK%2B3qQyw95oiCuNJgXnOs%3D&reserved=0)) held a prestigious Royal Society University Research Fellowship (2005-2014). She was appointed a Full Professor in Nanomaterials in 2013 at University College London. She leads a very dynamic group conducting cutting edge interdisciplinary and innovative research on the design, and synthesis of magnetic and plasmonic nanomaterials for biomedical applications.

In 2019, she has been honoured for her achievements in the field of nanomaterials, and her impactful project proposal and was awarded highly prestigious Royal Society [Rosalind Franklin Medal.](https://royalsociety.org/science-events-and-lectures/2019/10/rosalind-franklin-lecture/)

She published 116 research papers, book chapters, theme issues, proceedings. Among them 11 papers were featured in cover pages. With total 11000 citations, h index 33, i10 index of 58 and over 14 papers with over 100 citations among them 1 attracted over 2400 citations.

She has been Visiting Professor at various Universities in France, Japan, Singapore. She has been invited to speak at over 250 institutes and scientific meetings. She has been chairing and organising over 40 high profile international conferences.

She is Editor-in-chief of the Royal Society of Chemistry book Series, Nanoscience and Nanotechnology**.** She edited 4 theme issues: The Royal Society (2016), Interface Focus, “Multifunctional nanostructures for diagnosis and therapy of diseases”; The Royal Society Chemistry, RSC (2014), Faraday Discussions, “Physical Chemistry of Functionalised Biomedical Nanoparticles"; RSC (2013) Nanoscale, Special issue "Functional Nanoparticles for Biomedical Applications" and Philosophical Transactions of the Royal Society A (2010), “Nanoparticles”. She is the sole editor of two seminal books on Magnetic Nanoparticles from Fabrication to Clinical Applications (https://tinyurl.com/y5bgxb3r)

and Clinical Applications of Magnetic nanoparticles (<https://tinyurl.com/yyjawnz2>).

She is coorganising a Magnetic Carrier Meeting in Jun 2020 in London

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