

Open Data Description:

Title: Droplet microfluidics for the highly controlled synthesis of branched gold nanoparticles

Acceptance date: 22 Jan 2018

Authors: Sara Abalde-Cela, Patricia Taladriz-Blanco, Marcelo Ganzarolli de Oliveira and Chris Abell

Journal: Scientific Reports

Abstract:

The synthesis of anisotropic metallic nanoparticles (NPs) has been a field of intense and challenging research in the past decade. In this communication, we report on the reproducible and highly controllable synthesis of monodisperse branched gold nanoparticles in a droplet-based microfluidics platform. The process has been automated by adapting two different bulk synthetic strategies to microdroplets, acting as microreactors, for NP synthesis: a surfactant-free synthesis and a surfactant-assisted synthesis. Microdroplets were generated in two different microfluidic devices designed to accommodate the requirements of both bulk syntheses. The epitaxial growth of AuNSTs inside the microdroplets allowed for a fine control of reagent mixing and local concentrations during particle formation. This is the first time branched gold NPs have been synthesised in a microfluidics platform. The monodispersity of the product was comparable to the synthesis in bulk, proving the potential of this technology for the continuous synthesis of high quality anisotropic NPs with improved reproducibility.

Open data files provided:

Folder	File	Description
1	<i>Fig1B_1_raw</i>	Image before cropping – as acquired
	<i>Fig1B_2_raw</i>	Image before cropping – as acquired
	<i>Fig1B_3_raw and FigSI_1_a_raw</i>	Image before cropping – as acquired
	<i>Fig2B_3_raw</i>	Image before cropping – as acquired
	<i>Fig2B_4_raw</i>	Image before cropping – as acquired
	<i>FigSI_1_b_raw</i>	Image before cropping – as acquired
	<i>FigSI_1_c_raw</i>	Image before cropping – as acquired
2	<i>Droplets_Manuscript_SurFree</i>	ImageJ measurements for droplet size to build histogram for SI_Figure 1 d
	<i>Droplets_PVP_no PI</i>	ImageJ measurements for droplet size to build histogram for SI_Figure 1 e
	<i>Droplets_PVP_yes PI</i>	ImageJ measurements for droplet size to build histogram for SI_Figure 1 f

- Folder 1_Images – Images as acquired before cropping, light and contrast adjusting and scale bar.
- Folder 2_Data sheet for histograms.