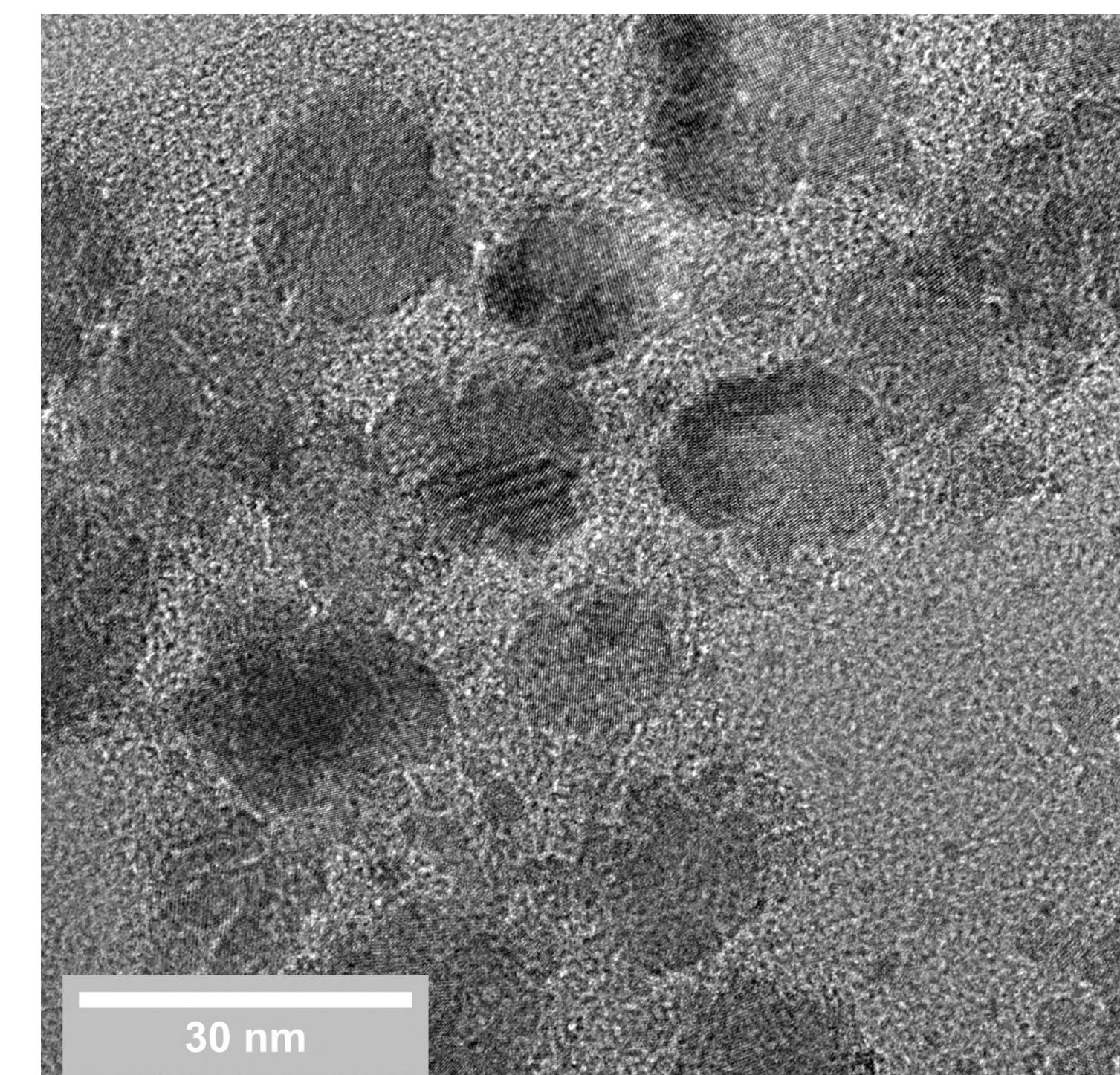
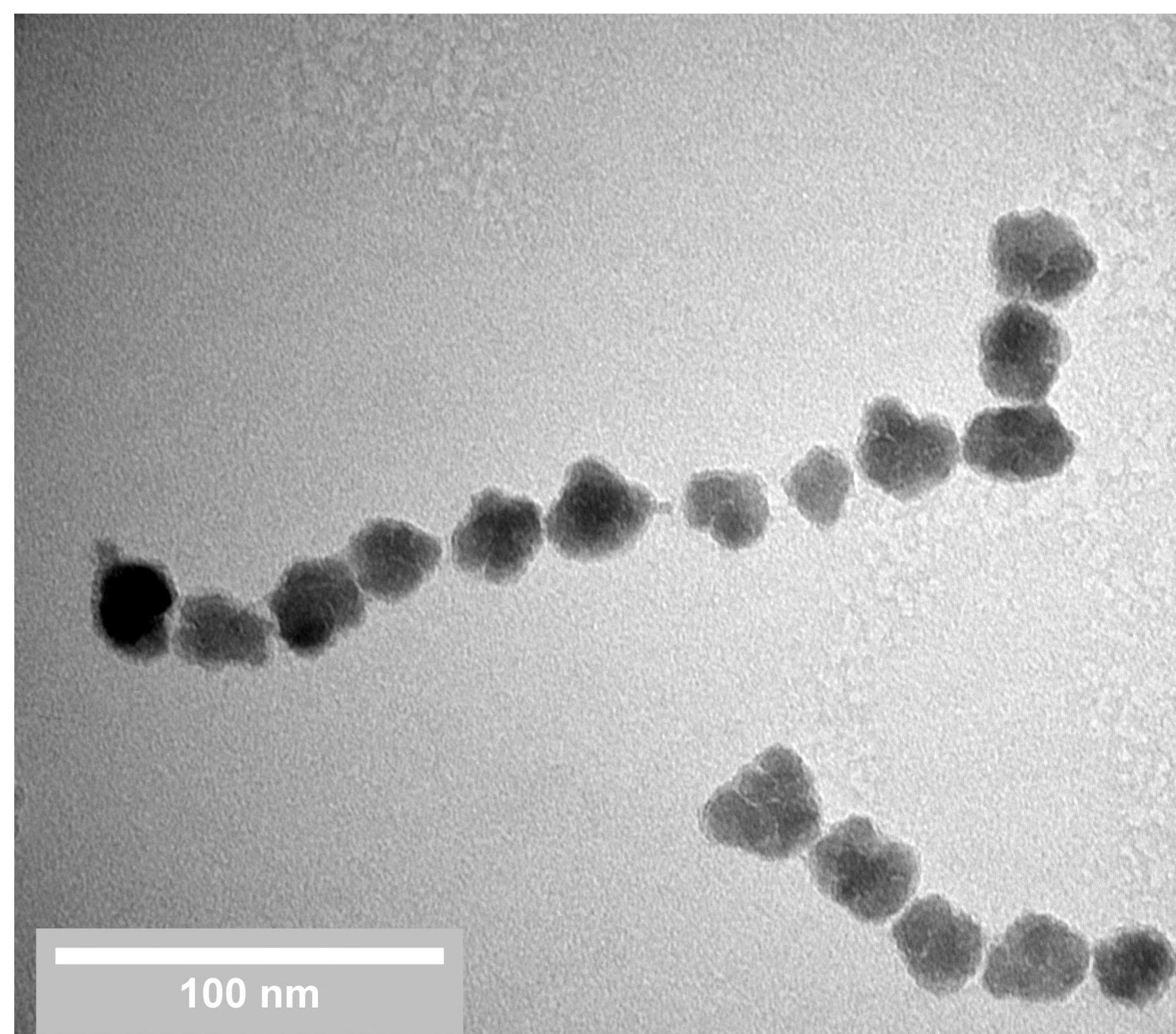
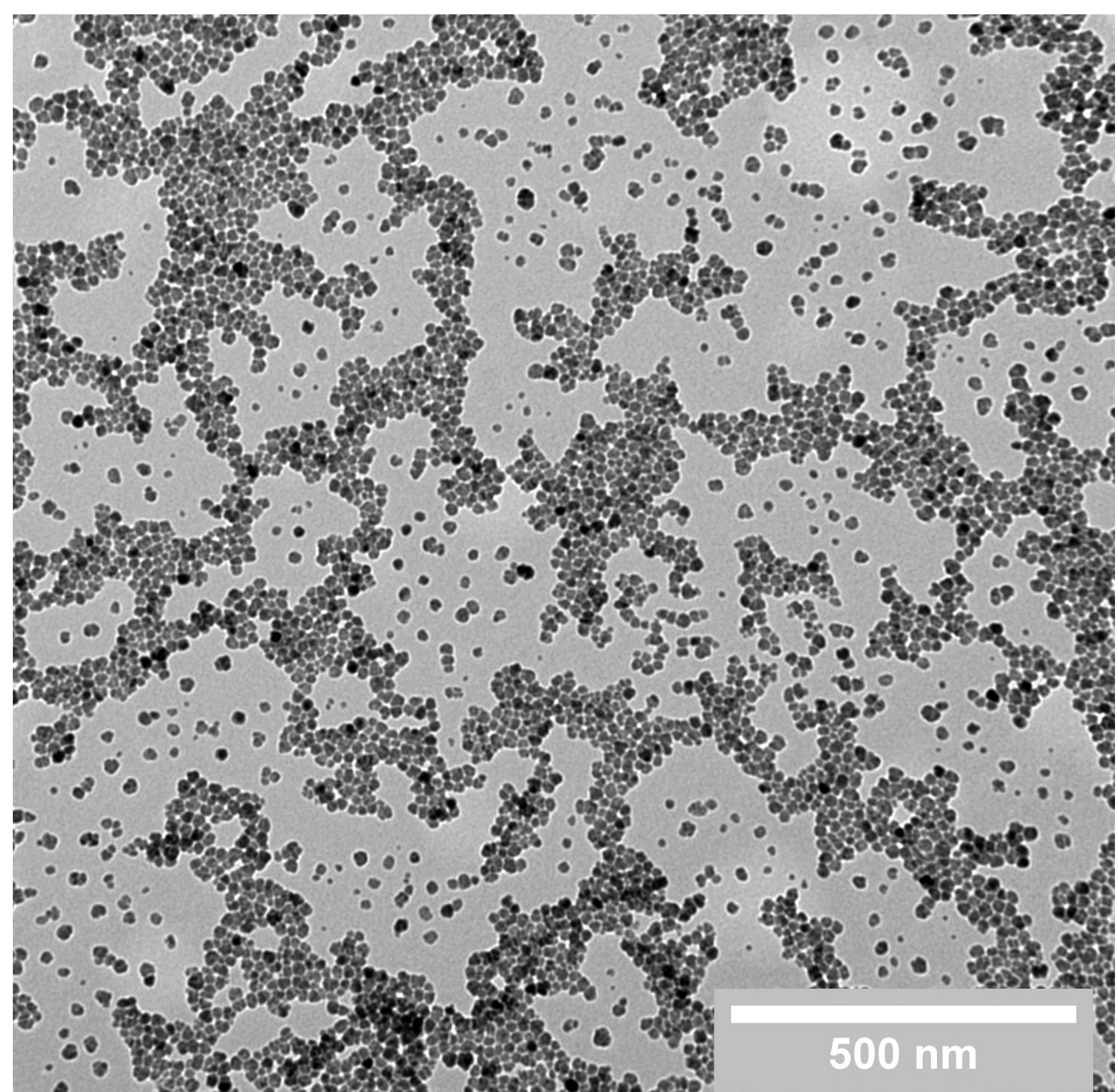
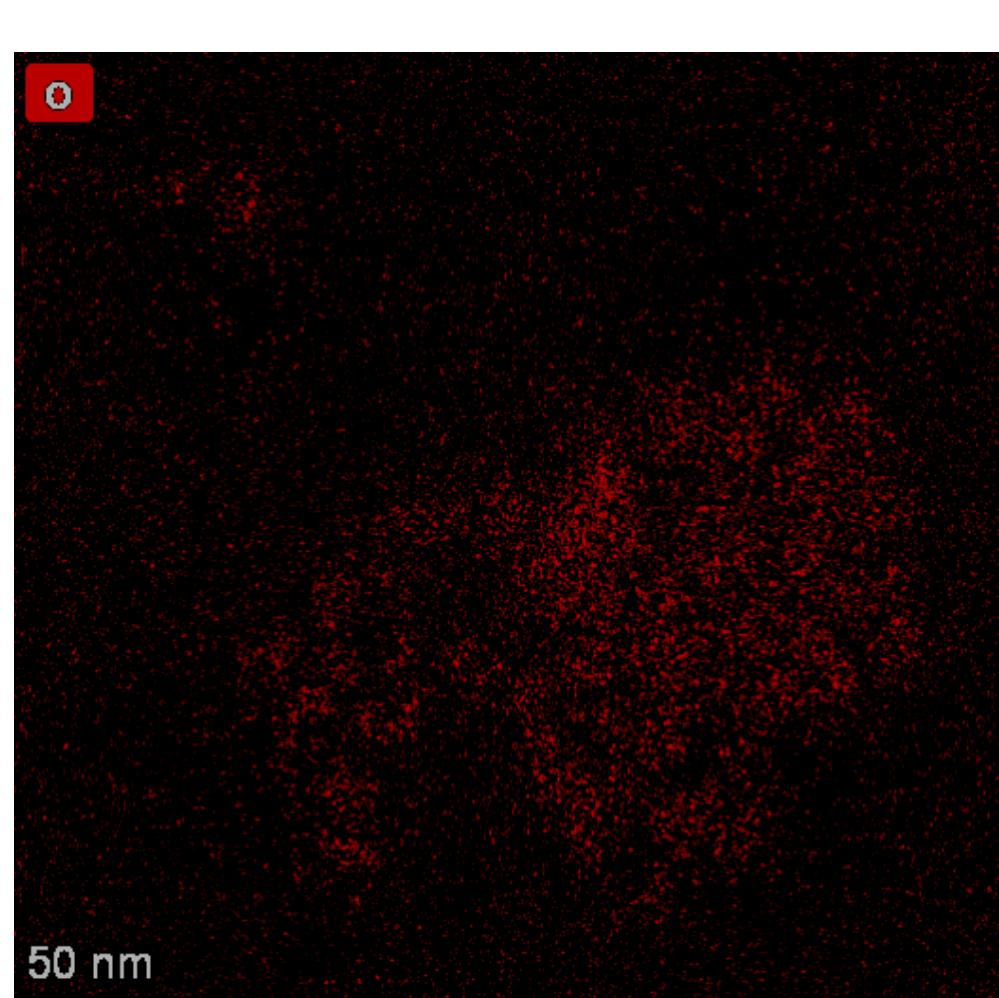
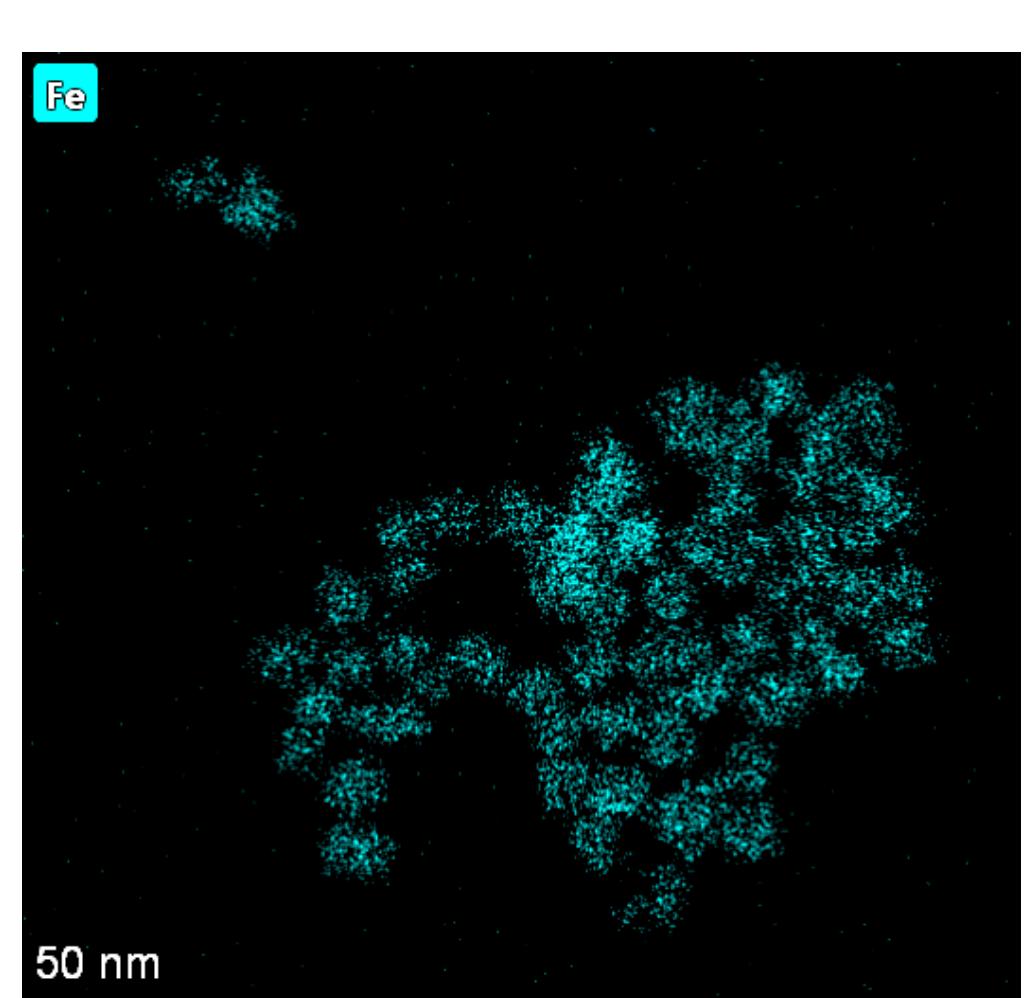
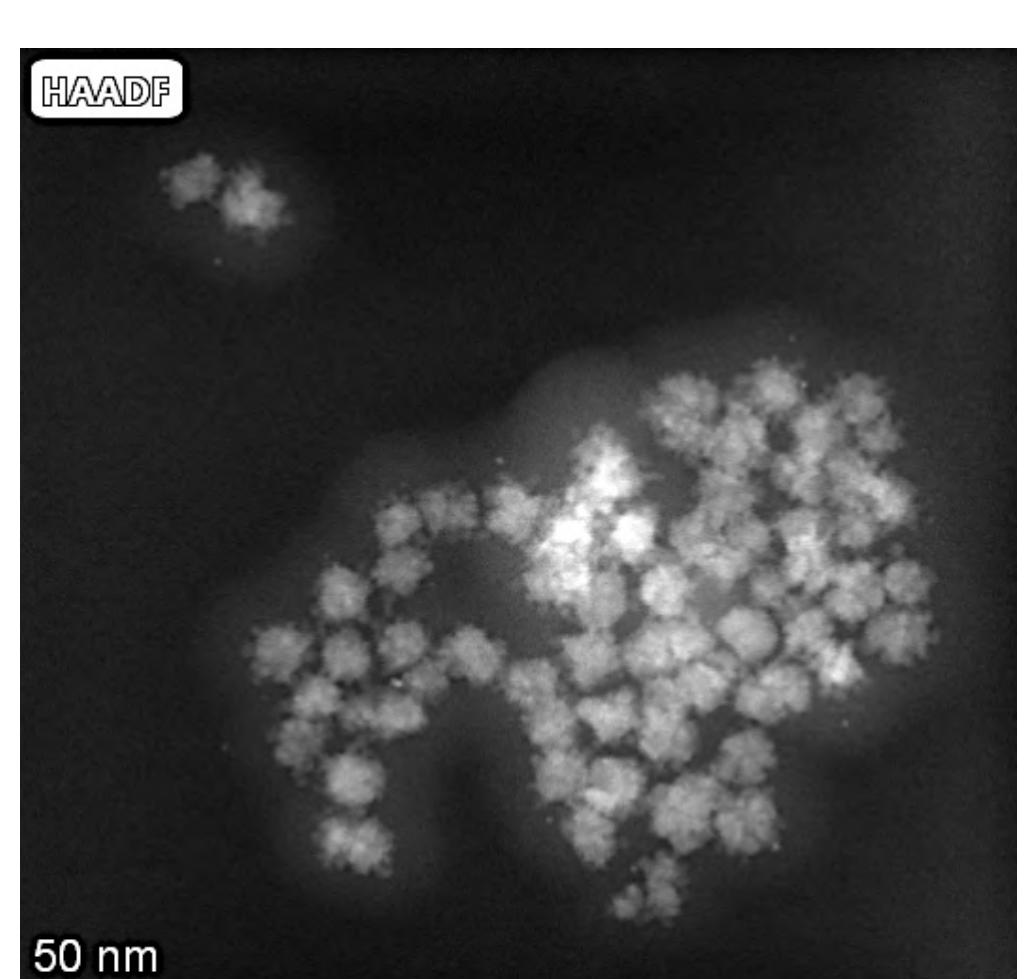


# Le magnétisme à l'échelle nanométrique

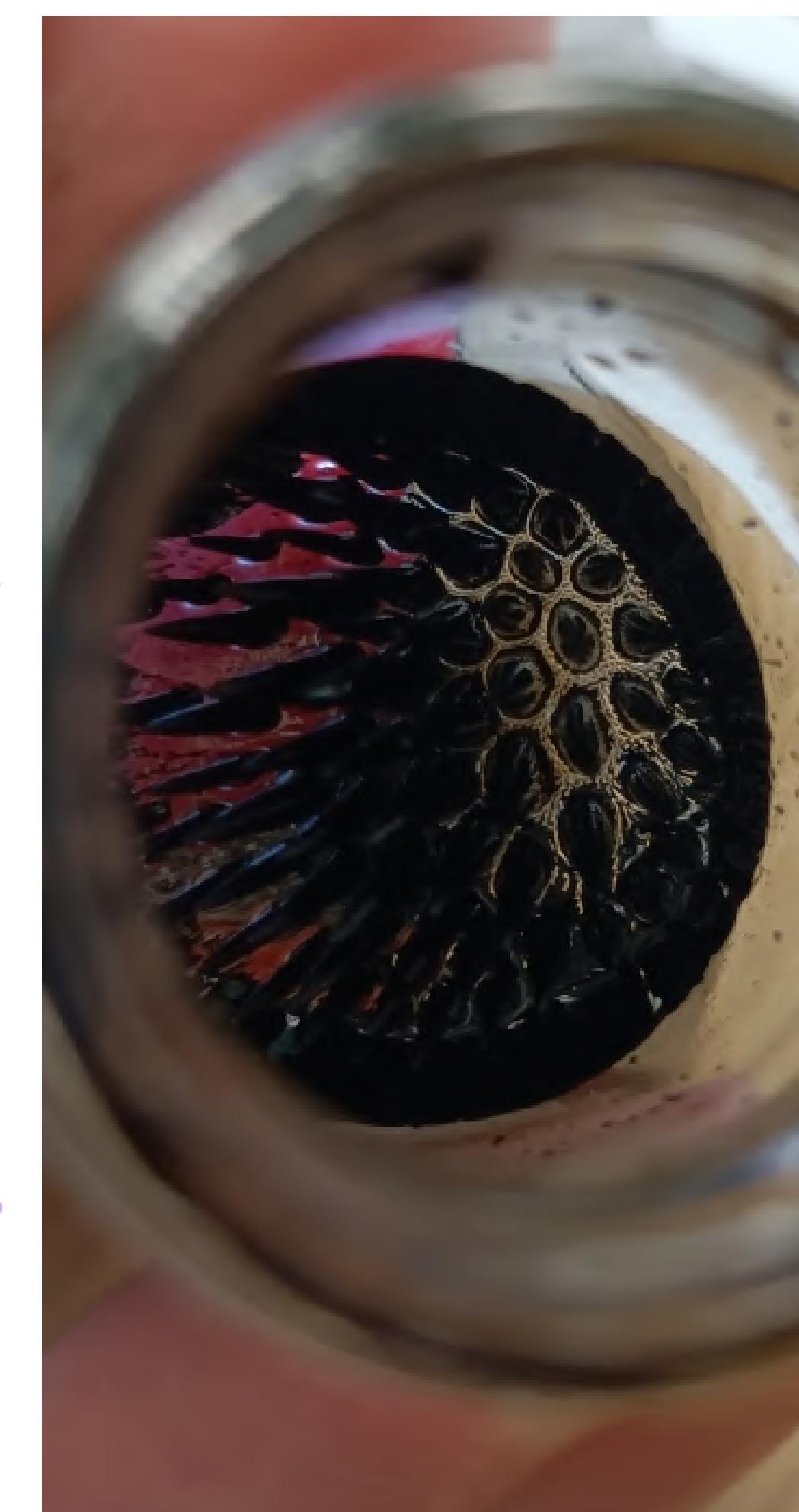
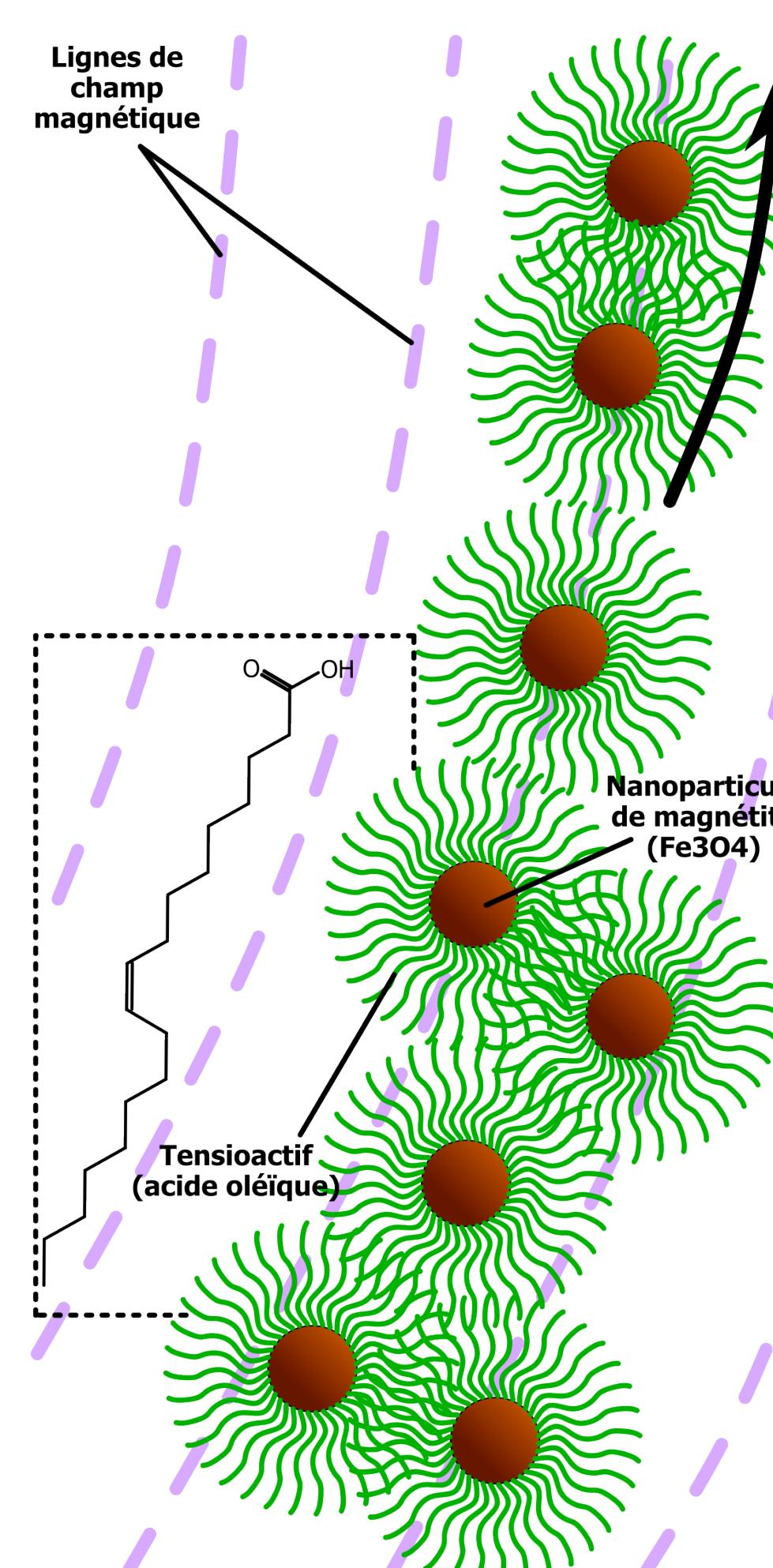
Des nanoparticules magnétiques...



## Composition et structure



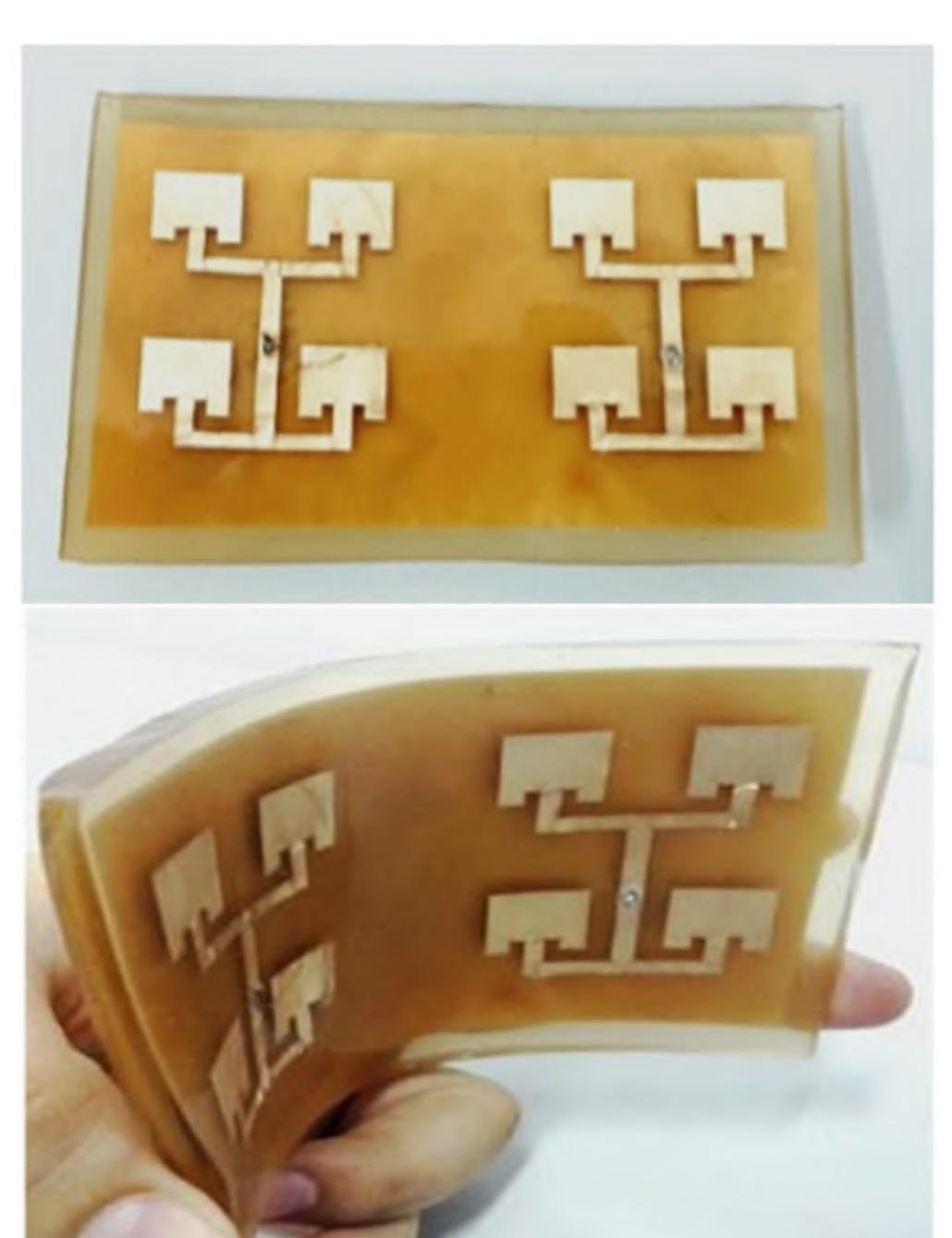
Structure magnétique ( $Fe_3O_4$ )  
=> propriétés magnétiques



Effet de champ magnétique + tension de surface  
(tensioactif) = structures pointues !

## ... aux nombreuses applications potentielles

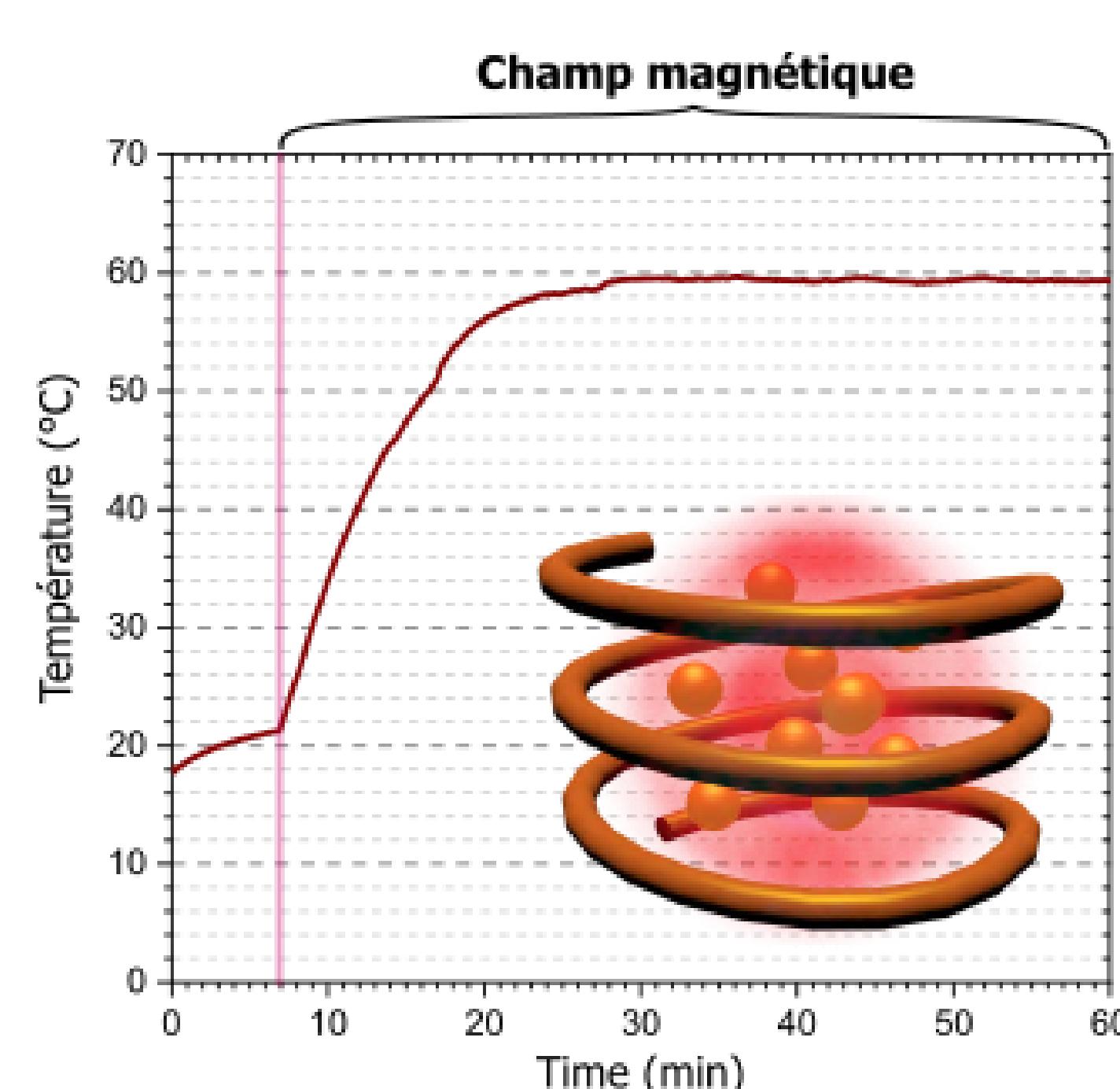
### COMMUNICATIONS



Alqadami et al. *Applied Physics A*, 2016, 122, 9

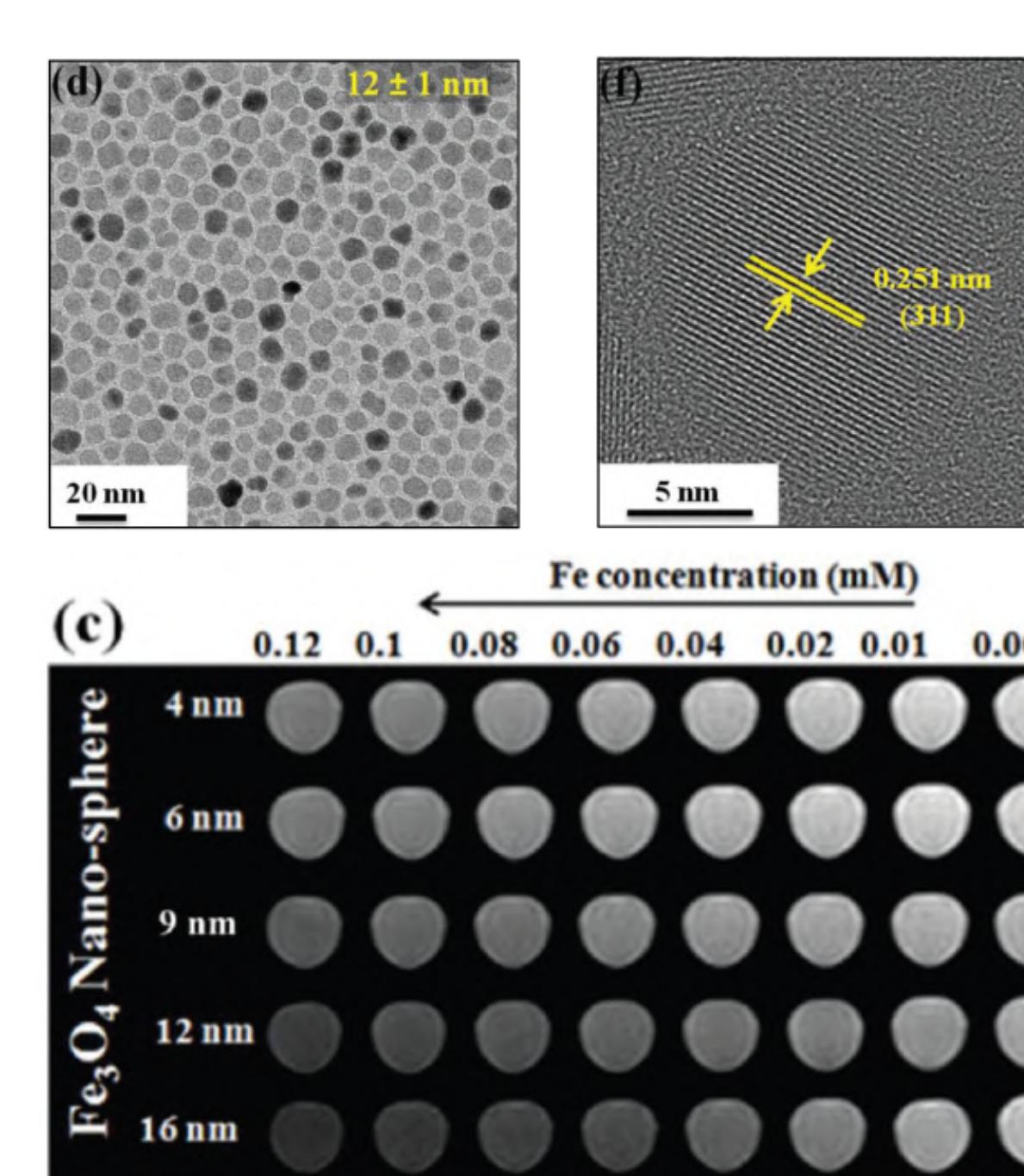
Réseau d'antennes (radio)

### TRAITEMENT DU CANCER



Hyperthermie magnétique

### IMAGERIE MÉDICALE



Agent de contraste IRM

### MATÉRIAUX INTELLIGENTS



Pièces d'impression 4D

Mohapatra et al. *Nanoscale*, 2015, 7, 9174