BBI Solutions

GOLD NANOPARTICLES FOR RAPID DIAGNOSTIC ASSAYS

Product Codes	EM.GC20 - 20nm Gold Nanoparticles EM.GC40 - 40nm Gold Nanoparticles EM.GC60 - 60nm Gold Nanoparticles EM.GC80 - 80nm Gold Nanoparticles
Applications	Lateral flow immunoassay, NALF/Molecular assay based lateral flow assay, Flow through assays, Vertical flow assays, Microarrays, SERS based applications, Dark field microscopy, Life sciences

Gold in rapid diagnostic tests

The quality and performance of a conjugate is critical to achieving consistent, accurate results in rapid diagnostic tests. Gold nanoparticles offer excellent stability and sensitivity. As the demand for increased sensitivity grows, gold has become regarded as a reliable raw material to provide an accurate visual reading.

BBI Solutions gold nanoparticle range for rapid diagnostic assays

	20nm Gold Nanoparticles	40nm Gold Nanoparticles	60nm Gold Nanoparticles	80nm Gold Nanoparticles
Average Diameter	19.0 – 21.0nm	37.0 – 43.0nm	57.0 – 63.0nm	77.0 – 85.0nm
Maximum acceptable %CV	8%			
Number of odd shapes per 100 particles	≤5			≤10
Optical density @520nm (using a 1cm pathlength)	• Bulk available at OD 1 • Up to 50mL available at OD 5/10	• Bulk available at OD 1 • Bulk available at OD 4.5-5.0 • Up to 50mL available at OD 10	• Bulk Available at OD1	• Bulk available at OD 1.0
Batch scale	Up to 100L at OD 1	Up to 340L at OD 1	Up to 64L at OD 1	Up to 64L at OD 1
Capping agent	Citrate			
Presentation matrix	Suspended in H_2O, no preservative			
Shelf life	15 months from date of manufacture	12 months from date of manufacture		
Storage	2 – 8°C – do not freeze			

BBI Solutions

Why BBI?

Used in over 400 million assays every year, our gold manufacturing technique guarantees:

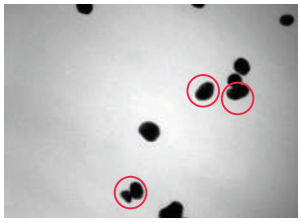
+ **Uniformity** with ≤5% odd shapes and a CV of ≤8%, the uniform shape and size of BBI gold ensures even antibody binding, giving reliable results in your assay
+ **High stability** – a minimum one year shelf life ensures a settled test manufacturing regime, saving you time and wastage
+ **Scalability** – our batch sizes go up to 340L (40nm) to ensure you have continuous supply
+ **Quality** – BBI gold must pass strict quality procedures before it's released to our customers, guaranteeing impressive performance characteristics at scale

BBI Quality

BBI's unique manufacturing technique allows for the production of **large batches of gold** to a high level of reproducibility of size, dispersion and shape.
This ensures a firm foundation for conjugation and peace of mind that your rapid assay will provide reliable results. This is not the case for all gold nanoparticles.

BBI 40nm Gold

Competitor 40nm Gold



Competitor comparison table – single typical batch of 20nm and 40nm gold nanoparticles

	BBI 20nm	Competitor 1 20nm	Competitor 2 20nm	BBI 40nm	Competitor 1 40nm	Competitor 2 40nm
Peak Wavelength	523	518	523	525	524.5	523
Average Particle Size (nm)	19.8	24.2	25.2	39.8	48.8	42.8
%CV	3.9	6.8	23.6	4.5	5.9	14.5
Odd shapes	1	0	11	1	2	2
PDi* @ 1/10 dilution	0.093	0.086	0.6	0.13	0.08	0.931
Z-average**	23.88	24.79	29.625	40.67	49.03	50.12

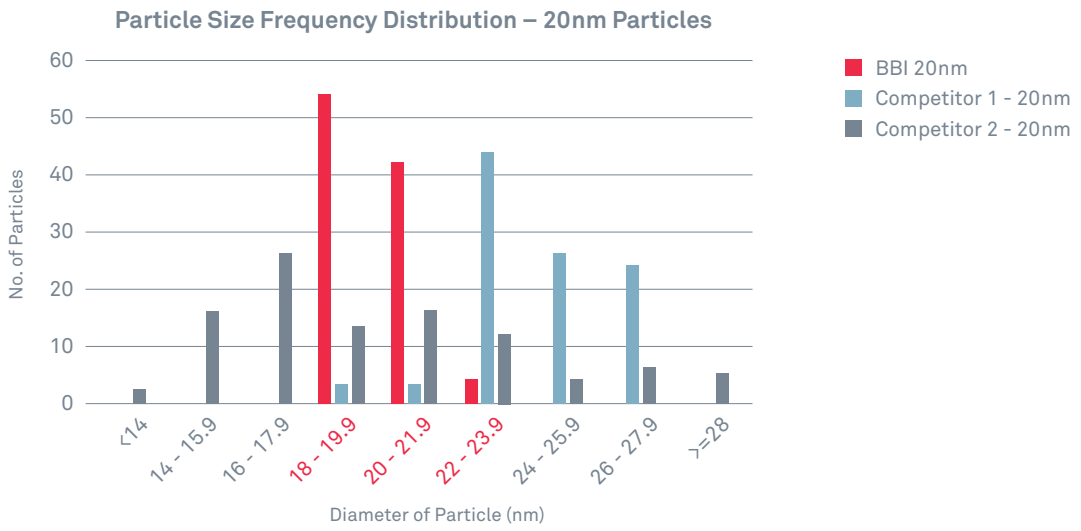
UV-Vis Spectrophotometer Analysis - Hitachi UV-Vis spectrophotometer Model U2800A - Verified daily against NIST calibrated metallised gratings
Transmission Electron Microscopy (TEM) Analysis - Phillips CM120 - Verified daily using gold nanoparticles calibrated to NIST standard
Dynamic Light Scattering (DLS) Analysis - Malvern NanoS upgraded to ZS - Verified by manufacturer

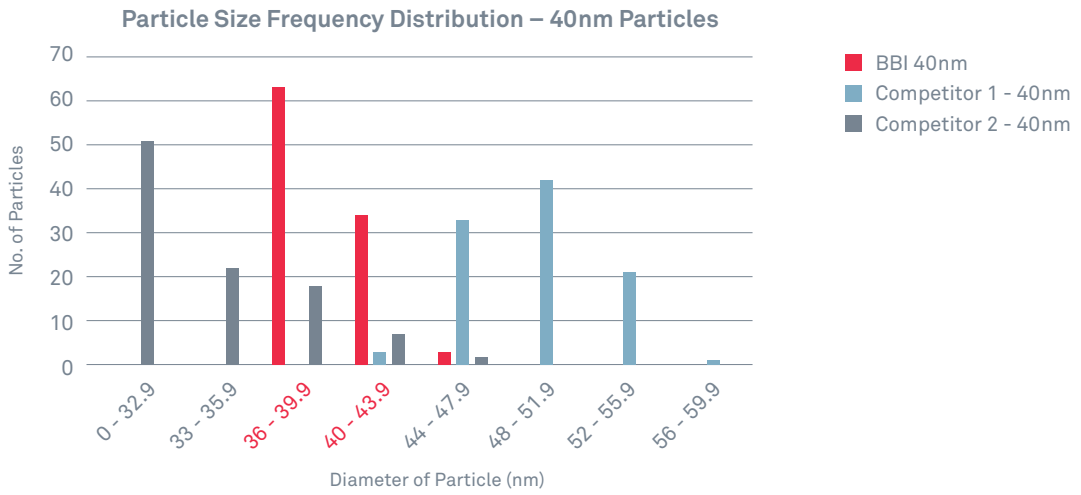
*PDi (polydispersity index): A measurement of how polydisperse a population of particles is. It can be inferred from the data whether there is a broad particle population distribution/secondary populations and/or aggregates of particles present. Results close to 0.1 or less indicate a monodisperse population.

**Definitions of DLS terms Z average: DLS infers the hydrodynamic diameter of particles through measurement of the amount of light scattered by the particle, and the speed at which the particle moves in fluid.

Order your evaluation sample today

GOLD NANOPARTICLES FOR RAPID DIAGNOSTIC ASSAYS





Advantages of outsourcing

There are many hidden costs in producing gold nanoparticles and conjugates in house.
By outsourcing manufacture to BBI, you can benefit from:

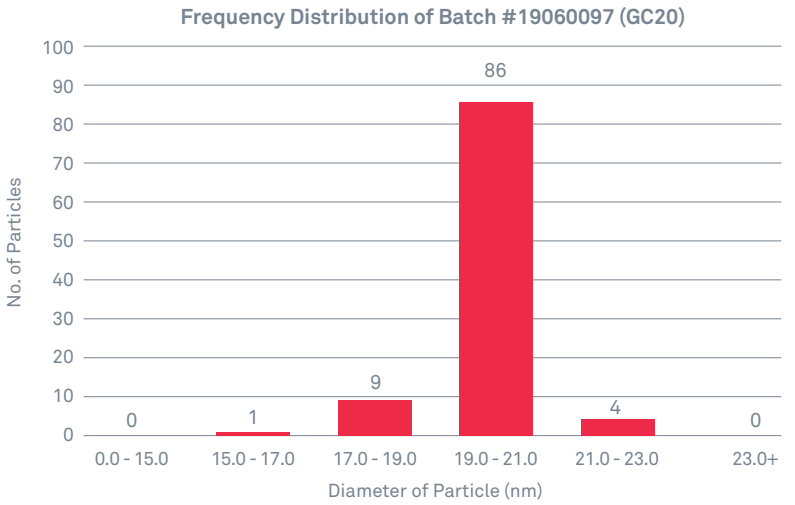
+ **More R&D time**- valuable R&D time is freed up to concentrate on the development of your assay systems
+ **More tests per litre of gold**- using BBI gold results in more tests per volume of conjugate, because consistent gold means less waste
+ **A faster route to market**- using BBI gold you can avoid delays caused by using a poor, inconsistent gold label, and commercialise your assay faster
+ **Enhanced sensitivity**- Access to a wide range of gold nanoparticle sizes to aiding selection to ensure optimum assay sensitivity
+ **Reliable stable raw materials on your shelf,** ready to go when you are. Flexible to your demand profile

EM.GC20
20nm GOLD NANOPARTICLES

Ordering Details

Product Code	OD	Pack Size
EM.GC20/4	OD1	20ml
EM.GC20/7	OD1	100ml
EM.GC20/1L	OD1	1000ml
HD.GC20.OD5/10	OD5	10ml
HD.GC20.OD5/50	OD5	50ml
HD.GC20.OD10/10	OD10	10ml
HD.GC20.OD10/50	OD10	50ml

Typical QC Data



Typical Dynamic Light Scattering (DLS) results

	BBI 20nm #19060097
PDi* @ 1/10 dilution	0.069
Z-average** (d.nm)	23.33

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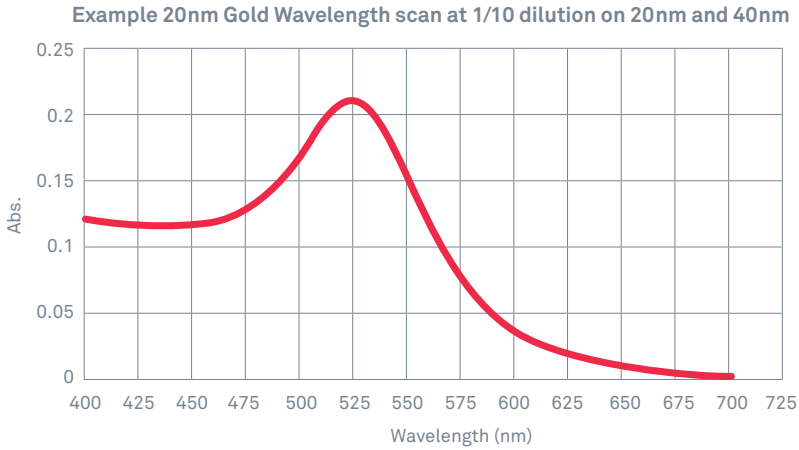
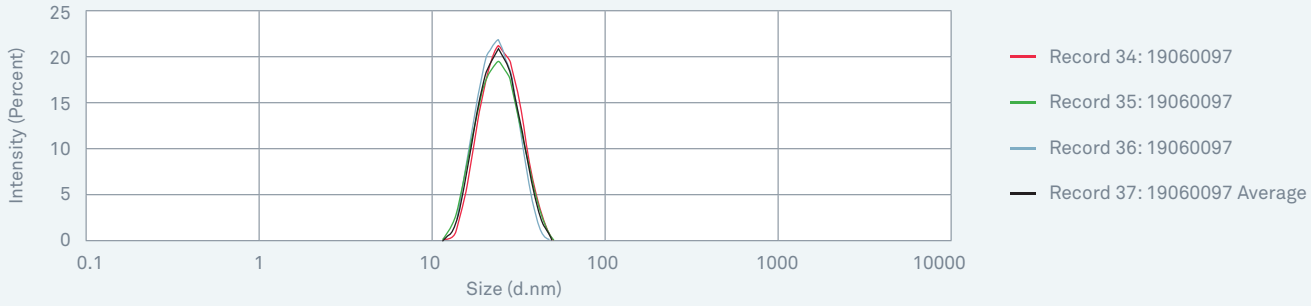


Size Distribution by Intensity



Order your evaluation sample today

EM.GC40
40nm GOLD NANOPARTICLES

Ordering Details

Product Code	OD	Pack Size
EM.GC40/4	OD1	20ml
EM.GC40/7	OD1	100ml
EM.GC40/8	OD1	500ml
EM.GC40/1L	OD1	1000ml
EM.GC40 SPL	OD4.5-5.0	Packed to order
HD.GC40.OD10/10	OD10	10ml
HD.GC40.OD10/50	OD10	50ml

Typical Dynamic Light Scattering (DLS) results

	BBI 40nm #19070115
PDi* @ 1/10 dilution	0.137
Z-average** (d.nm)	41.65

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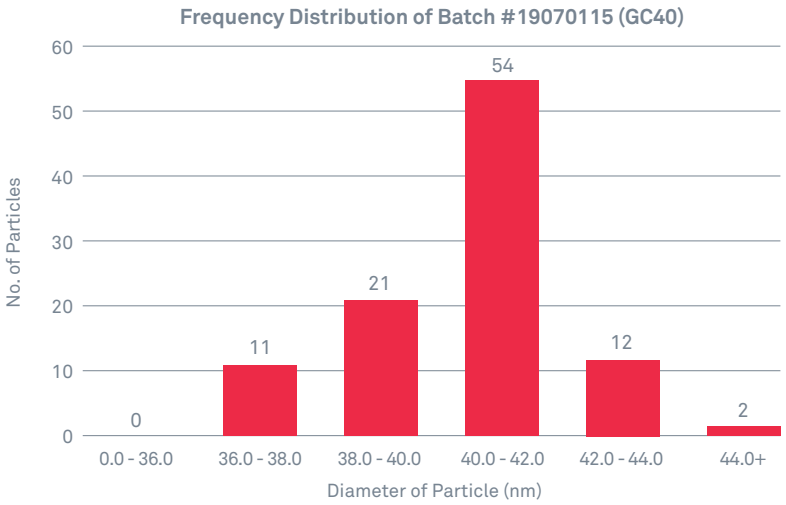
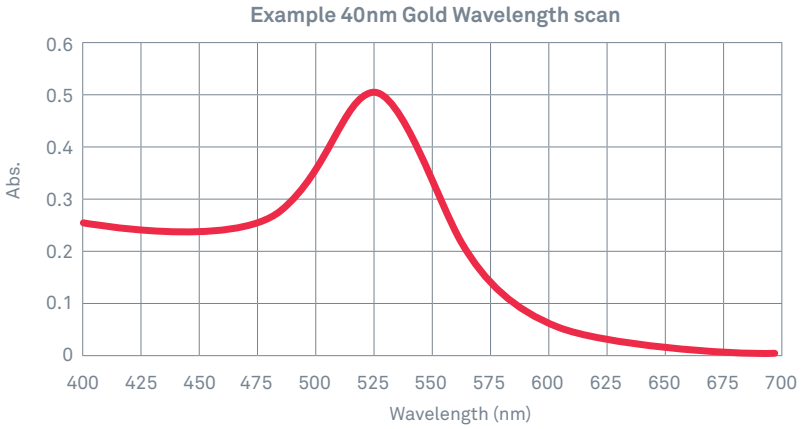
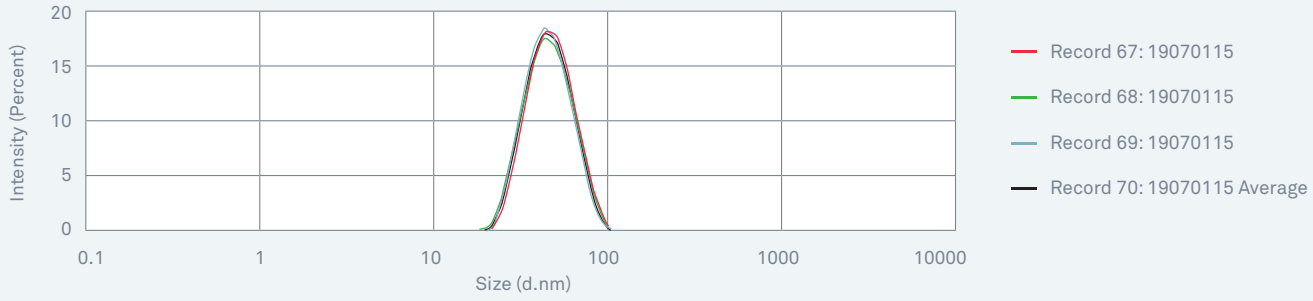
Typical QC Data





Size Distribution by Intensity

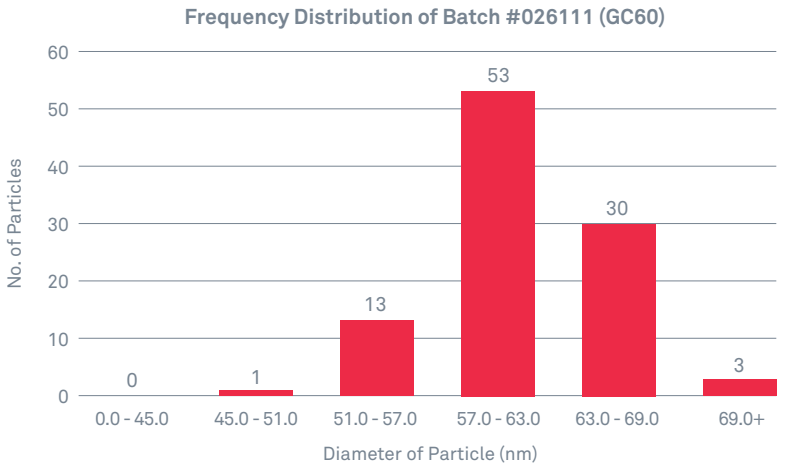


EM.GC60
60nm GOLD NANOPARTICLES

Ordering Details

Product Code	OD	Pack Size
EM.GC60/4	OD1	20ml
EM.GC60/7	OD1	100ml
EM.GC60/1L	OD1	1000ml

Typical QC Data



Typical Dynamic Light Scattering (DLS) results

	BBI 60nm #026111
PDi* @ 1/10 dilution	0.140
Z-average** (d.nm)	61.77

*PDi (polydispersity index): A measurement of how polydisperse a population of particles is. It can be inferred from the data whether there is a broad particle population distribution/secondary populations and/or aggregates of particles present. Results close to 0.1 or less indicate a monodisperse population.

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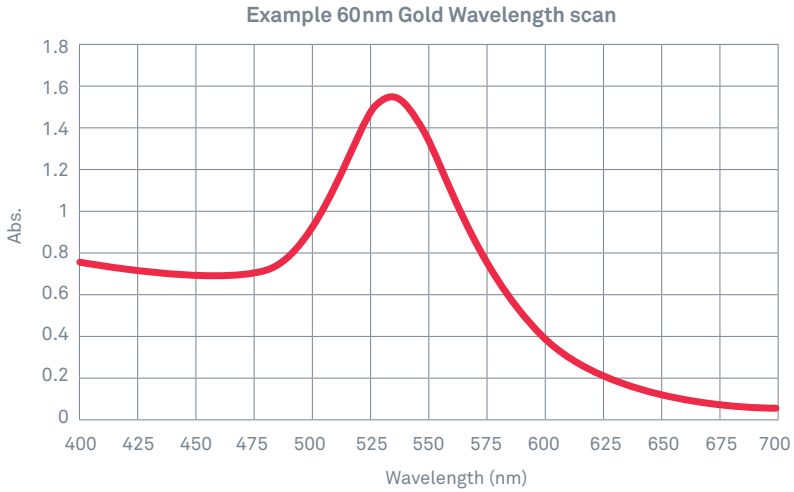
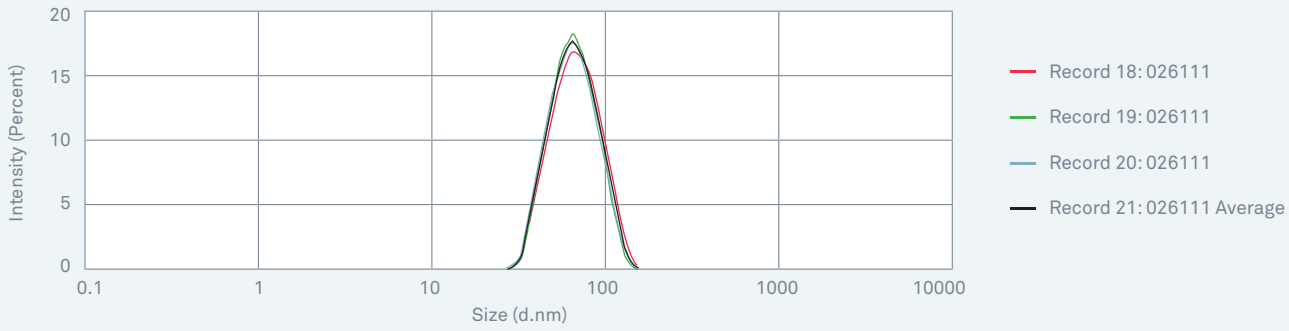


Size Distribution by Intensity



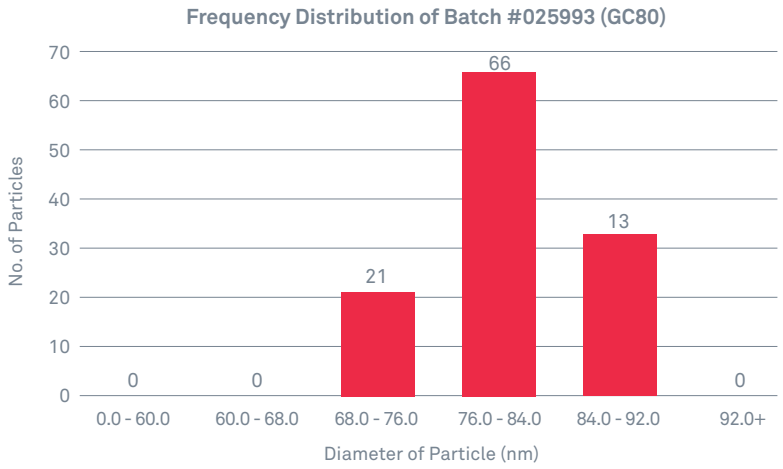
Order your evaluation sample today

EM.GC80
80nm GOLD NANOPARTICLES

Ordering Details

Product Code	OD	Pack Size
EM.GC80/4	OD1	20ml
EM.GC80/7	OD1	100ml
EM.GC80/1L	OD1	1000ml

Typical QC Data



Typical Dynamic Light Scattering (DLS) results

	BBI 80nm #025993
PDi* @ 1/10 dilution	0.139
Z-average** (d.nm)	81.72

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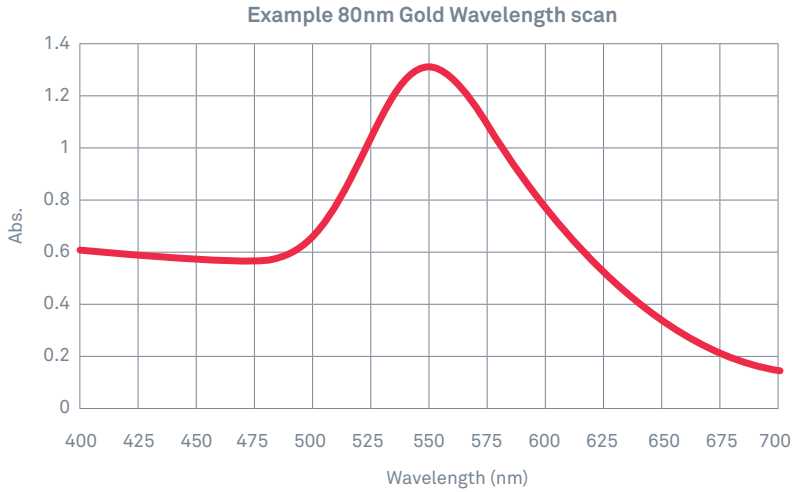
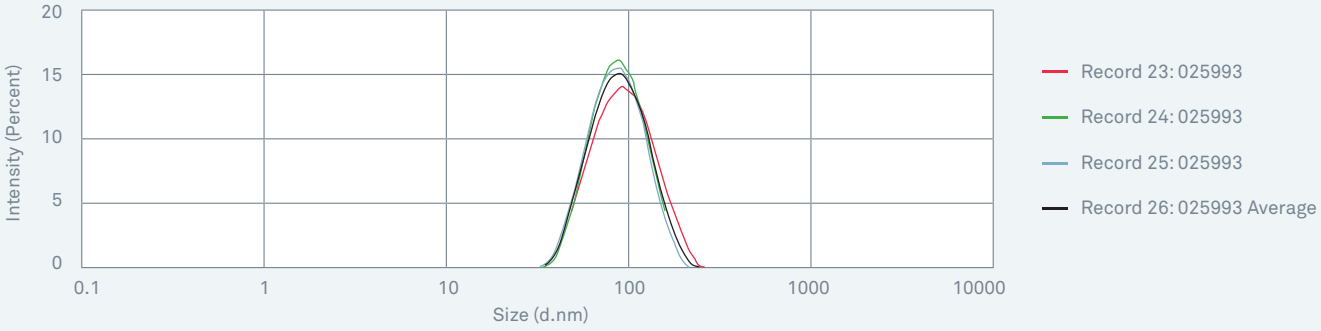


Size Distribution by Intensity



Selected References

20nm Gold Colloid

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Karakus, Cebrail, Zeynep Ulupinar, Fahri Akbas, and Duygu Yazici. "Detection of Anti-CagA Antibodies in Sera of Helicobacter pylori-Infected Patients Using an Immunochromatographic Test Strip." Journal of Chromatographic Science Advance Article (0015).

40nm Gold Colloid

Magiati, Maria, Vasiliki M. Myridaki, Theodore K. Christopoulos, and Despina P. Kalogianni. "Lateral flow test for meat authentication with visual detection." Food Chemistry 274 (2019): 803-807. Nybond, S., Réu, P., Rhedin, S. et al. Anal Bioanal Chem (2019) 411: 813. https://doi.org/10.1007/s00216-018-1503-y

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60nm Gold Colloid

Perumal, Jayakumar et al. "SERS-based detection of haptoglobin in ovarian cyst fluid as a point-of-care diagnostic assay for epithelial ovarian cancer." Cancer management and research vol. 11 1115-1124. 31 Jan. 2019, doi:10.2147/CMAR.S185375

80nm Gold Colloid

Aveyard J, Mehrabi M, Cossins A, Braven H, Wilson R. One step visual detection of PCR products with gold nanoparticles and a nucleic acid lateral flow (NALF) device. Chemical Communications (Cambridge, England). 2007 Nov(41):4251-4253. DOI: 10.1039/b708859k

Related Products and Services

Gold Starter Packs (GCKITDIAG)	Are you using gold for the first time, or trying a new process and are unsure of which size particle to purchase? Our gold starter packs allow a comprehensive evaluation, comprising 100ml and/or 20ml each of a selection of our gold nanoparticles.
Custom Conjugation Service	Our custom conjugation service provides high quality conjugates, conditions assessed and selected to meet your unique quality control requirements. Our scientists work in partnership with customers to bring all the vital ingredients together and provide scalable, sensitive, stable, reproducible conjugates time after time, up to 10's of litres.
High OD Gold	High OD gold can be used to simplify the conjugation procedure. By removing centrifugation steps in the concentration process there may be an opportunity to reduce production time, labour costs and waste. Our high OD gold nanoparticles are available as 20nm and 40nm and at concentrations of OD5 and OD10.

BBI™ Solutions

Get in touch to order an evaluation sample, or purchase directly at www.bbisolutions.com

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