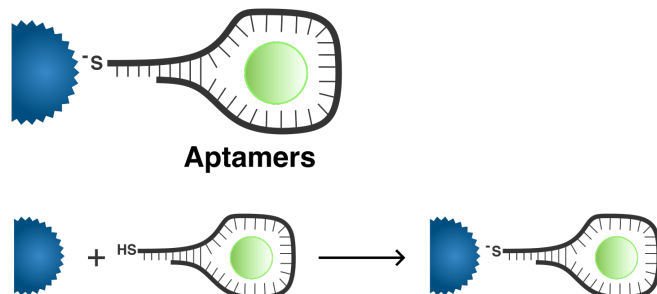


## PRODUCT DATA SHEET

### AptamerREADY™ Gold NanoUrchin Conjugation Kit



**Aptamers**

#### Description

Cytodiagnosics AptamerREADY™ Gold NanoUrchin conjugation kits have been optimized for high efficiency one-step conjugation of thiolated aptamers directly to the gold NanoUrchin surface.

The kit contains ready-to-use pre-made mixtures. No activation, manipulation, or time consuming “salt-aging” steps are required for conjugation. Simply mix your reduced thiol-modified aptamer with the supplied pre-activated gold NanoUrchins. Conjugation of the aptamer is achieved by the formation of a strong and stable gold-thiol bond without any additional linkers.

#### Features & Benefits

- Allows conjugation of aptamers to gold NanoUrchins with sizes between 50nm-100nm.
- Fast and convenient one-step conjugation reaction with no pre-activation requirements or manipulation of the gold NanoUrchins.
- No time-consuming “salt-aging” procedures.
- Results in a thiol-aptamer conjugated directly to the gold NanoUrchin surface without any linkers.
- Optimized for use in crosslinking based lateral flow applications.

#### Gold NanoUrchin Specifications

**Gold surface:** Proprietary AptamerREADY™ coating

**Core diameter:** Available with diameters from 50nm-100nm

**Optical density (OD):** OD=2 when the contents of each vial are dissolved to a final volume of 1 ml.

**Particles per ml:** Core size dependant, please see table II.

**Lambda max:** Core size dependant, please see table II.

#### Storage

Store at -20° C. Stable for at least 3 months if stored as specified.

#### Product Safety and Handling

This product is for R&D use only, not for drug, household, or other uses. Please review the material safety datasheet (MSDS) available online for proper safety and handling procedures.

#### Procedure

##### *Reduction of thiol-modified aptamers (e.g. trityl-S-S-Aptamer)*

1. Prepare a 0.15 M sodium phosphate buffer, pH 8.5 supplemented with 0.1 M DTT.
 

**Note:** pH is important for proper reduction of oligonucleotide.
2. Dissolve lyophilized aptamer to a final concentration of 500 μM in H<sub>2</sub>O.
3. Mix 50 μl of dissolved aptamer with 450 μl sodium phosphate buffer.
4. Incubate 1-2 hours at room temperature to reduce aptamer.
5. Separate reduced aptamer from trityl-SH and DTT using a NAP 5 column operated in H<sub>2</sub>O, GE Healthcare.
6. Final eluate from NAP 5 column will be 1 ml in H<sub>2</sub>O with an approximate concentration of 25 μM.

**Note:** Exact concentration of final eluate can be measured with UV-VIS spectroscopy by measuring the absorbance at 260nm.

##### **Conjugation of thiolated aptamer to AptamerREADY™ gold NanoUrchins**

1. Resuspend one vial of lyophilized AptamerREADY™ gold NanoUrchins with 740 μl of H<sub>2</sub>O.
2. Transfer into a 1.5 ml microcentrifuge tube.

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- Add 160  $\mu\text{l}$  of reduced thiolated aptamer at 1  $\mu\text{M}$  (0.0075 nmol/ $\mu\text{l}$ )\* in  $\text{H}_2\text{O}$  as prepared above and incubate for at least 1 hour at room temperature.

**Note:** 1  $\mu\text{M}$  aptamer is a good starting concentration, but if aggregation or poor sensitivity is observed, the following Aptamer concentrations can be attempted for a given NanoUrchin size range (based on a 30nt oligonucleotide):

Particle size (nm)	50-70	80-100
[aptamer] ( $\mu\text{M}$ )	0.25-10	0.1-5

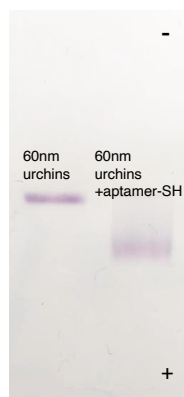
- Add 100  $\mu\text{l}$  of 1M NaCl.
- Incubate for at least 1 hour at room temperature to allow binding of the aptamer to the gold NanoUrchin surface.

**Note:** Longer incubation times may improve surface coverage.

- Centrifuge at the appropriate speed for your particular gold NanoUrchin size (see table I) for 30 minutes to pellet your aptamer gold NanoUrchin conjugate.
- Remove supernatant.
- Resuspend conjugate in 200  $\mu\text{l}$  of storage buffer. The optical density of the particles should be 10 if a 100% recovery has been achieved.

*Common storage buffer: 10 mM sodium phosphate buffer, pH 7.0, 100 mM NaCl and 0.01% (w/v) NaN<sub>3</sub>.*

- Measure optical density with a spectrophotometer and adjust concentration as desired.
- Store conjugate at +4°C.



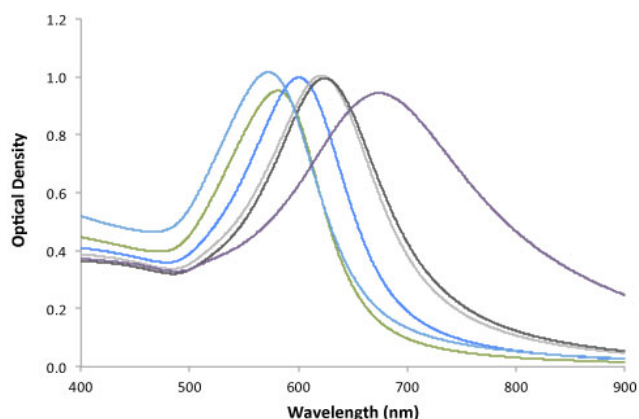
**Figure 1.** 0.5% (w/v) agarose gel analysis of 60nm AptamerREADY™ gold NanoUrchins before and after functionalization with a thiolated aptamer (30 bases). Gel was operated at 100V in 0.5X TBE buffer for 30 minutes.

**Table I.** Appropriate G forces for centrifugation of gold NanoUrchins. Note that recommended conditions are for a volume of 1ml and centrifugation using a microcentrifuge.

Size (nm)	Speed (g)	Time (min)
50	2,000	30
60	1,125	30
70	700	30
80	600	30
90	500	30
100	400	30

**Table II.** Gold NanoUrchin specifications by size. Please note that all values below are indicated at an optical density of 1 (OD/cm<sup>-1</sup>) at their respective lambda max. At other optical densities the values need to be adjusted (e.g. NPS/ml (@OD2) = 2 x NPS/ml (@OD1)).

Diameter (nm)	Peak SPR Wavelength (nm)	NPS/ml	Wt. Conc. (mg/ml)	Molar Ext (M <sup>-1</sup> cm <sup>-1</sup> )	Size Dispersity (+/-nm)	Particle Volume (nm <sup>3</sup> )	Surface Area (nm <sup>2</sup> )	Surface/Volume Ratio	Particle Mass (g)	Molar Mass (g/mol)	Molar Conc.
50	560	3.51E+10	4.45E-02	1.72E+10	<8%	6.54E+04	7.85E+03	0.12	1.27E-15	7.64E+08	5.83E-11
60	585	1.96E+10	4.30E-02	3.07E+10	<10%	1.13E+05	1.13E+04	0.1	2.19E-15	1.32E+09	3.25E-11
70	600	1.20E+10	4.17E-02	5.03E+10	<10%	1.80E+05	1.54E+04	0.086	3.48E-15	2.10E+09	1.99E-11
80	620	7.82E+09	4.06E-02	7.70E+10	<10%	2.68E+05	2.01E+04	0.075	5.20E-15	3.13E+09	1.30E-11
90	630	5.37E+09	3.97E-02	1.12E+11	<8%	3.82E+05	2.54E+04	0.067	7.40E-15	4.46E+09	8.92E-12
100	670	3.84E+09	3.89E-02	1.57E+11	<8%	5.24E+05	3.14E+04	0.06	1.02E-14	6.11E+09	6.37E-12



Catalogue Number	Description	Sizes
AUC-50-X*	50nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions
AUC-60-X*	60nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions
AUC-70-X*	70nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions
AUC-80-X*	80nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions
AUC-90-X*	90nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions
AUC-100-X*	100nm AptamerREADY Gold NanoUrchin Conjugation Kit	3 reactions & 10 reactions

\*X Indicates quantity, i.e. -1 for a 3 reaction kit and -2 for a 10 reaction kit

For custom sizes and information on bulk quantities and prices please contact our customer service department.

## Ordering Information

For ordering call 866-344-3954 or visit us online.