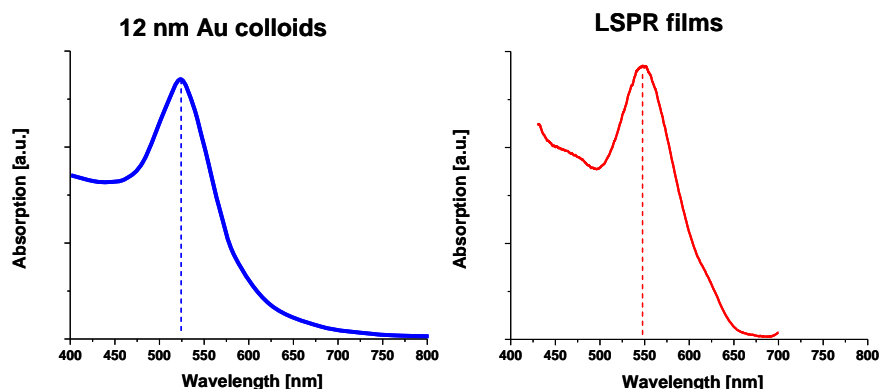


LamdaGen LSPR Biosensor Chips Compared to Gold Colloids

LamdaGen LSPR biosensor chips are made of a thin gold film with surface patterns defined at the nanoscale level via a proprietary clean-room technique.

LSPR films exhibit a rich color and reflectivity resembling the UV-Vis of conventional gold colloids. The absorption maximum shifts with changes in the index of refraction of the solution, yielding a refractive index sensitivity $S \sim 70\text{-}100 \text{ nm/RIU}$. The figure of merit, i.e., the refractive index sensitivity S divided by the plasmon width is ~ 1.5 and closely matches the value for gold colloids.



Comparison between the UV-Vis spectrum of a 12 nm Au colloidal solution and the absorption of an LSPR film. The Au colloid solution has a $\lambda_{\text{max}} \sim 525 \text{ nm}$, the LSPR film has $\lambda_{\text{max}} \sim 550 \text{ nm}$ although different deposition conditions yield films with plasmon positions between 530 nm – 580 nm. Notice the fwhm (full width half maximum) of Au colloids and LSPR films are similar and so is their response $\Delta\lambda_{\text{max}}$ to changes in the index of refraction of the solution. Structurally, LSPR films integrate billions of tiny Au nanostructures in mm^2 .

Although LSPR films retain optical properties similar to those of nanoparticles of Au, LamdaGen's nanostructured thin films have a number of advantages:

1. LamdaGen's LSPR films are compatible with:
 - a. a wide range of solvents (DMSO, alcohols, aqueous buffers)
 - b. broad pH environments (e.g. 1 M HCl – 1M NaOH)
 - c. very high ionic strengths ($> 1 \text{ M NaCl}$)
 - d. temperatures $> 80 \text{ }^\circ\text{C}$
2. LamdaGen film has a clean, uncoated surface ready for the formation of Self-Assembled Monolayers (SAM), silanization or other coatings needed for further functionalization.
3. LamdaGen films are functionalized through conventional bioconjugation techniques.
4. LamdaGen LSPR films are stable, easy to handle and can be grown on various surfaces (e.g. glass, polystyrene, etc.) in any shape or dimension.