

Supporting Information
Two-Dimensional Array Debye Ring Diffraction Molecular Recognition Sensing

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Experimental Section

Polystyrene (PS) particles of 650 nm diameter were synthesized according to a previously reported method.^[S1] The 2-D particle arrays were fabricated by using the previous needle tip flow method.^[S2] The arrangement and morphology of the arrays on hydrogels was observed by using a Scanning Electron Microscope (SEM, Joel JSM6390LV) after sputter coating a thin layer of Au. Diffraction measurements were conducted at a fixed angle by utilizing an Ocean Optics USB2000-UV-VIS Spectrometer, a LS-1 tungsten halogen light source and an R-series Fiber Optic Reflection Probe. The hydrogels were equilibrated in avidin solutions in water or in 0.1 M NaCl and then were placed onto an Ag glass mirror for diffraction measurements. The Debye diffraction was measured by using a 532 nm laser pointer (Lightvision Technologies, Corp.).



Figure S1. Photograph taken at an angle of 19° to the 2-D array hydrogel normal showing the 2-D PS array biotin hydrogel diffracted colors in pure water (left) and in 0.1 M NaCl (right). The 2-D array hydrogels were placed on an Ag mirror. The diffraction of the 2-D hydrogel in pure water on the left is in the IR and cannot be visualized.

References

[S1] C. Reese, S. A. Asher, *J. Colloid Interface Science* **2002**, 248, 41.

[S2] J. T. Zhang, L. Wang, D. N. Lamont, S. S. Velankar, S. A. Asher, *Angew. Chem. Int. Ed.* **2012**, 51, 6117.