

IV. Materials, Fabrication and Integration for Sensor Architectures

(B1) Chemically Directed/Selective Self-Assembly of Nanoscaffolds

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Nanoscaffolds consist of readily self-assembled materials that can be used to organize other types of matter in 2 or 3 dimensions. For example, branched DNA motifs have been used numerous times to organize proteins and gold nanoparticles in 2D arrays. As another example, layer by layer deposition of polyelectrolytes provides a mechanism to organize species of interest in non-repetitive patterns in three dimensions. In all cases, higher levels of control (of physical properties or dimensional control) are desired. The next steps in scaffold design should entail the organization of novel materials (semiconductors, dyes, etc.) and should also include increasing the level of control of positional and/or orientation ordering of these organized species. In addition, the extent of organization typically has been limited, on the order of a micron in two dimensions; novel approaches to increasing the size of the nanoscaffolds appear to be necessary. Further impediments to the development of applications employing nanoscaffolds are issues of reproducibility and site selective growth. Abstracts addressing these issues, as well as their utilization in the development of nanoscale devices and systems, are particularly welcomed.