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# The Importance of Chemistry for Nanotechnology

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## Abstract

The paradigm shift from uniform bulk materials towards nanostructured multifunctional materials is essential for future knowledge transfer from fundamental to applied sciences. In nanotechnology, two approaches are employed: "top-down" and "bottom-up". In the top-down approach, larger assemblies are broken down to smaller units, while the bottom-up approach makes use of atomic or molecular building blocks to construct the desired nanostructures. Chemistry plays a major role in the bottom-up approach by providing progressive building blocks, such as "smart" molecules, that can be combined — preferentially by self-organisation — to create fundamentally new classes of materials. The ultimate goal is to create environmentally friendly, highly efficient, low-cost devices serving multifunctional purposes for a steadily more diversified modern society.

**Keywords:** bottom up, materials, nanotechnology, self-organisation