Interactions of Polyoxometalates with Basic Fibroblast Growth Factor

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We report here a new structural family of basic fibroblast growth factor binding ligands. Three representative polyoxometalates compounds of the Keggin, the Wells-Dawson and the trivacant Keggin-derived sandwich class were found to interact with basic fibroblast growth factor. The binding induces dramatic conformational changes in the growth factor. The interaction stabilizes bFGF to thermal denaturation, urea-induced unfolding and protects it from trypsin digestion. The size, charge and composition of POMs might all be interrelated in the recognition. Furthermore, binding site of POMs in the vicinity of the heparin-binding region of bFGF was proposed. The POMs represents a promising lead compound for the design and synthesis of new compounds that might recognize and bind to bFGF, and which may represent a new avenue for the development of therapeutic agents against bFGF- induced angiogenesis.