**Learning from Nature for better sensing: interrogation of snakes, fish, and spiders**

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I will briefly overview recent results from our research group on designing and synthesis of bio-inspired hybrid, organic-inorganic nanomaterials and structures with enhanced sensing performance. Particularly, suspended membranes of snake thermal receptors served as a example for the fabrication of freely standing nanomembranes by means of spin-assisted layer-by-layer assembly which are explored as extremely sensitive thermal sensors. In a second example, synthetic hydrogel capped hairs with record fluid flow detection limit were mimicked after biocupulae of blind cave fish which serve for underwater navigation of these species. Finally, unique torsional properties of stiff suspended air-sensing hairs of jumping spiders were directly measured with direct point-load experiment to demonstrate their pN sensing threshold.