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What can we expect from new therapeutic strategies in nano-pharmacology and nano-medicine ?

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Abstract

When talking about nano-pharmacology and nano-medicine one can expect fundamental new solutions in the broad fields of pharmacy as well as human and veterinary medicine. However, it is not only the precise knowledge about the molecular interactions on a nanoscale level. Furthermore, it is essential to understand and apply the sub-molecular based survival strategies which e.g. marine organisms are using for more than a billion years. The arsenal of methods used in the Research Institute for Bioinformatics and Nanotechnology (RI-B-NT) for the functional and structural elucidation of bioactive molecules is applied on various molecules from plant and animal origin. Beside clinical studies and cell biological techniques, NMR, molecular modeling (especially quantum chemical calculations), mass spectrometry, atom force microscopy, surface plasmon resonance techniques also measurement with a quartz crystal microbalance are carried out. This combination of methods is extremely suited for the analysis of various processes in the extracellular matrix, which are related to nerve cell repair, antimicrobial processes and cancer therapy (1-7). One main research project of our institute concerns bio-active molecules in Cnidaria (e.g. jellyfishes). Jellyfishes are a rich source of interesting collagen variants, lectins, defensins and proteoglycans. We are testing these molecules after detailed structural analysis in various cell cultures as well as in clinical studies.

Biography

Hans-Christian Siebert, Dipl. Phys., Dr. rer. nat., Dr. med. vet. habil., Prof. of Biochemistry and Biophysics; study of physics and biochemistry at the Universities of Kiel and Heidelberg. She completed her dissertation at the Max-Planck-Institute for Medical Research, Heidelberg and obtained her PostDoc at the University of Utrecht (NL), Bijvoet Center for Biomolecular Research at the Departments of Bioorganic Chemistry and NMR-Spectroscopy. She was awarded Habilitation (*Venia legendi* for Biochemistry), Ludwig-Maximilians-University, Munich. Since 2007, she has been the Chair and Head of the institute for Biochemistry and Endocrinology, faculty for Veterinary Medicine at the Justus-Liebig-University Giessen. Also, since 2010, she has been the Scientific Director at the Research Institute for Bioinformatics and Nanotechnology (RI-B-NT) at the KITZ in Kiel, Germany.