纳米科技产业报告

S-layer Proteins as Basic Building Blocks for Nanobiotechnological Applications

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SUMMARY: Crystalline bacterial cell surface layer (S-layer) proteins have been optimized during billions of years of biological evolution as constituent elements of bacterial and archaeal cell envelopes. The broad application potential of S-layers in nanobiotechnology is based on the specific intrinsic features of the monomolecular arrays composed of identical protein or glycoprotein subunits. Most important physicochemical properties and functional groups on the protein lattice are arranged in well-defined positions. Many applications of S-layers depend on the capability of isolated subunits to reassemble into monomolecular arrays in suspension or on suitable surfaces (e.g. polymers, metals, silicon wafers) or interfaces (e.g. lipid films, liposomes). S-layers also represent a unique structural basis and patterning element for generating more complex supramolecular structures involving all major classes of biological molecules (e.g. proteins, lipids, glycans, nucleic acids or combinations of that). Thus, S-layers fulfil key requirements as building blocks and patterning elements for the production of new supramolecular materials and nanoscale devices as required in molecular nanotechnology, nanobiotechnology, and biomimetics.

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主体报告简介：

结晶的细菌外表层蛋白（SLP）已经在亿万年生物进化中被优化成为细菌和古细菌的细胞外被膜的组成元素。SLP在纳米生物技术领域中具有广泛的应用潜力，这种潜力是来源于这种高度均一性的蛋白质或者糖基化蛋白的亚基自组装形成的单分子层阵列所具有的独特的本质特征。SLP单分子层蛋白阵列上最重要的物理化学特征和功能基团都被排列在明确规定的位置上。很多SLP技术的应用扩展都依赖于SLP独立亚基在悬浮液或者适合的表面（例如：聚合物，金属，硅片等）或者界面（例如类脂膜，脂质体等）上重新组装成单分子层阵列的能力。SLP也代表了一个可形成更加复杂的超级分子的独特的结构基础和图案元素，这种复杂的超分子结构可以包括所有主要的生物分子类别（例如：蛋白质，类脂，葡聚糖，核酸，及它们的组合）。因此，SLP满足了作为分子纳米技术，纳米生物技术和生物仿生学领域所必需的生产新型超分子材料和纳米器件的积木和图案元素的关键的必要条件。

主讲人简介:

Prof. Uwe B. Sleytr, studied Food and Biotechnology at the University of Natural Resources and Life Sciences, Vienna (BOKU). After receiving his Ph.D. he worked as senior research scientist at the MRC-Laboratory for Molecular Biology and the Strangeways Research Laboratory, Cambridge, England (1972-1975), and as visiting professor at the Department of Microbiology and Immunology, Temple University, Philadelphia, USA (1977-1978). From 1980-2010S he was head of the Department of NanoBiotechnology (former Center for Ultrastructure Research and Ludwig Boltzmann Institute for Molecular Nanotechnology), BOKU, Vienna, Austria.

Prof. Sleytr´s interests bring together molecular nanotechnology, nanobiotechnology and biomimetics with a particular focus on the assembly of functional supramolecular structures for life and non life science applications. He received numerous awards for his research (e.g. Sandoz-Novartis Award, Philip Morris Research Award), and is a member of the Austrian Academy of Sciences, the New York Academy of Sciences, the European Academy of Sciences and Arts. In 2012 he has been elected a Fellow of the American Institute for Medical and Biological Engineering.

400 publications, 4 books, several international patents. Numerous opening and key note lectures at international nano(bio)technological conferences.

Sleytr教授在奥地利维也纳自然资源与应用生命科学大学（BOKU）从事食品与生物技术的研究。获得博士学位后，他作为分子生物学高级科研人员工作于英国剑桥市MRC实验室和Strangeways实验室(1972-1975年)。1977-1978年期间，他作为访问教授在美国费城的Temple大学微生物与免疫学系工作。1980-2010年，他担任了奥地利维也纳BOKU大学纳米生物技术系（前超微结构研究中心和路德维希玻尔兹曼分子纳米技术研究所）的负责人。

Sleytr教授的研究方向主要包括分子纳米技术、纳米生物技术和生物仿生学，尤其集中在功能性超分子结构的自组装在生命科学和非生命科学领域的应用。Sleytr教授的研究成果为他赢得了大量的奖项和荣誉，其中包括山德士-诺华奖、菲利普莫里斯研究奖等。Sleytr教授是奥地利科学院院士、纽约科学院院士和欧洲科学与艺术学院院士。2012年被选为美国医学和生物工程研究所研究员。

Sleytr教授发表过400多篇科学论文，出版了4本专著，拥有数项国际专利，在多次国际生物纳米科技会议上作过重要的开幕致辞和主题发言。

2011年，Uwe B. Sleytr博士加入海狸创业团队并成为海狸股东，作为公司高级技术顾问，指导SLP技术的研发和产业化。