Introduction to the exhibition “SCIENCE & ART" on the conference “PROTEIN & PEPTIDES - STRUCTURE, FUNCTION and BIOTECHNOLOGY” July 24-27, 2023 Geneva, Switzerland
Science and Art are Two Sides of a Single Coin

(The artwork shown at the exhibition is owned by Menicon Co.,LtD.)

Science evolves in a stringent framework of providing reproducible methods anywhere in the world. Most relevant in science, we do not unconditionally get “what we want” but rather “what we can”. And this “what we can” depends on the methods available for performing examinations and studies. With art, such limits do not exist and with a creative mind, one can enter and experience virtually an unlimited freedom of thought and emotions, and thus arbitrarily fill the “open space” left between the networks of knowledge. In this context, I would like to emphasize that scientific activities have never been my sole focus of interest. Looking back, my inspiration for artistic activities started quite early in my life. At the age of 16, I started carving wood and modelling with clay. These activities were primarily focused on copying African art, particularly masks. My fascination for masks was strongly determined when I saw African, Asian, Oceanic, and Native American mask collections in ethnological museums. Masks have enormous expressive power and have already been used as a very ancient human practice across the world for ceremonial and practical purposes as well as protective armour. This is the primary reason I use mask-like sculptures to visualize the intersection between science and art, and in particular the unpredictability and mystery of scientific visions.

I would like to begin with a few basic remarks. It is now evident that achievements and predictable progress in synthetic biology including genome editing imply the potential for a most significant interference with the course of evolution by human. In this context it is well to remember that fossil findings and molecular biology data allow a precise reconstruction of the evolution of life forms, including that of humankind in its present manifestation. Nevertheless, this accumulated data and knowledge do not allow any prediction of the future of evolutionary events. On the other hand, future methods emerging in synthetic biology might enable the engineers of biology to design new species of living organisms or could even have influence on the further development of humans. Thus, the result of synthetic biology might be considered as an intentional extrapolation of evolutionary events, bypassing billions of years of biological developments.

In my mask like sculptures produced of baked clay gilded with leaf gold, the multiple sense organs, such as the eyes and the noses, the components of the skeleton or changes in skull dimensions emblematize the non-predictable, self-induced or self-enhanced evolution of humans as consequence of the input and application of synthetic biology including genome editing. I should add that I formed the clay exclusively with my bare hands without any modelling tool for achieving a direct transfer from part of my morphology into the ductile material, like a derivative during an arbitrary evolution event. Most importantly, I did not start with any drawing but simply let the formation happen in a state of “flow”. With sculptures composed of two or multiple parts linked together the lower part, which may resemble morphological details recognized in the main body, symbolize the release of information as required for communication. I choose gilded surfaces for obtaining a surface image as neutral as possible thus preventing any optical distraction from the proper morphology. To illustrate the intrinsically unpredictable evolution, even when determined by synthetic biology, the sculptures were subsequently modified in two ways. One procedure involved splashing the sculptures with colored water which was performed and photographed under the guidance of the recognized conceptual photographer Fritz Simak. In a second approach for illustrating arbitrary evolutionary events, I generated dynamically distorted images of the sculptures in deformed mirror foils. The intention was to symbolize with these snapshots trial and error events during a biological evolution driven by humans. Again, although being part of such a process, the results are unimaginable and

incomprehensible due to human intellectual limitations. My contemplations of the relevance and potential of synthetic biology on the future changes to our species, particularly self-enhancement and acceleration of evolutionary processes, led me to the production of images from different surroundings in arbitrarily distorted mirror foils without any mirrored sculptures. These images were subsequently modified in their colours by computer. I associate these pictures with the idea that developments in synthetic biology may eventually lead to beings endowed with cognitive abilities far beyond our present capability for abstract thought and intellectual efficiency.

Selected images from both the splashed sculptures and images obtained in deformed mirror foils have found a permanent place as the exclusive decoration in a building of the Vienna Institute of Biotechnology, which belongs to the University of Natural Resources and Life Sciences Vienna.

I was also very fortunate to have found such fascination in the beauty and diversity of macromolecular structures based on S-layers, which as most abundant protein on the planet represents a work of art created and optimized by nature during billions of years of biological evolution. *Sleytr UB and Pum D (2025) S-layers: from a serendipitous discovery to a toolkit for nanobiotechnology. Quarterly Reviews of Biophysics 58(e4), 1-49.*

To sum up, living in a world of science and art, I could benefit from the mutually stimulating effect of both human endeavors. I would like to end with a statement from Shuguang Zhang (MIT) in the foreword to my book “Curiosity and Passion for Science and Art” *(Sleytr UB (2016) Curiosity and Passion for Science and Art - “S-LayerProteins of Bacteria and Archaea”. Series in Structural Biology. WorldScientific. ISBN 9813141816)* “Science and art are two sides of a single, fabulous coin. They both are rooted in humankind’s natural curiosity, creativity, imagination, and honesty. These characteristics eventually lead not only to new insights and new knowledge, but also to expression of humans’ deepest feelings towards nature and their fellow men”.

A detailed presentation of my artistic activities and the artwork can be requested via homepage: www.art-and-science.eu with the accesses "Exhibitions and Events" and "Links".

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