

■ Research Profiles

Knowledge for knowledge's sake:

Personal thoughts on Professor Lars Olof Björn's impact on plant UV photobiology and on Swedish popular science over the last three decades (at least)

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Swedish Plant UV Photobiology and collaborations with Lars Olof

The national Plant UV Photobiology scene in Sweden is small and has been so for at least the last 25 to 30 years, with maximally five research groups active in the field at the same time. Lars Olof has of course been its star performer and the inspiration for all the groups, and Lund University has been the intellectual epicentre of these efforts.

Two of the research groups (headed by Nils G A Ekelund, now at Malmö University, and Sten-Åke Wängberg at University of Gothenburg) centred their research on UV and aquatic photosynthetic organisms. Nils in his early career collaborated with Lars Olof at Lund University, where he also did his PhD. Janet Bornman and her group performed top class UV research on e.g. plant physiology, photosynthesis, and global issues. This includes her instrumental contribution to the United Nations Environment Programme (UNEP) manifested in the quadrennial assessments on environmental effects of ozone depletion and its interactions with climate change. Finally, myself concentrated on molecular and biochemical aspects of UV-B effects and responses in model species such as pea and *Arabidopsis*. Given the

disparate interests of the Swedish Photobiology research groups, any clustering of knowledge within plant UV photobiology never occurred in our country. Instead, there has been considerably more international collaboration for these groups than collaborations nationally.

The exception to this was of course Lars Olof. As the omnipotent intellectual he is, he masters all these parts of photobiology and more. He contributed a lot to the science of some of the groups and published research papers with all above mentioned scientists, with the possible exception for Sten-Åke. Lars Olof of course also participated heavily in the work for UNEP, especially in the early years.

Thus, a few fruitful collaborations between my own research group and the groups at Lund University resulted and I am holding the days of joint efforts in fond memory. In the late 90's and early 00's my group was interested both in UV-B-dependent tissue-specific expression of defence genes and tissue-specific DNA damage and the correlation between the two at the signalling level. The pea variety *Argenteum* has leaves with an epidermal cell layer that can easily be peeled off if the plants have been grown under the right conditions. Together with the

Lund groups and the group of Profs. Tadashi Kumagai and Jun Hidema at Tohoku University, Japan, we studied both DNA damage and expression of defence genes in mesophyll and epidermal tissue after UV-B exposure in acclimated and non-acclimated *Argenteum* plants (Kalbin et al. 2001). Using this set-up we were able to decouple DNA damage from induction of expression of general defence genes, i.e. concluding that DNA damage itself was not a molecular regulator of transcription of these genes.

A few years later, when Lars Olof suffered from ill health for several months, he had a young scientist from China, Dr. Shaoshan Li, on the way in from South China Normal University in Guangzhou for the second time as a visiting scientist to Lund. Lars Olof thought he might not be able to fully support Shaoshan the way he wanted to and therefore contacted me as a back-up. Thus, Shaoshan came to us in Örebro and our collaboration with him and Lars Olof became fruitful. Several papers resulted from Shaoshan's visit. In the most important of these studies Lars Olof was personally involved to a large extent. We had designed a UV irradiation device in Örebro based on a high power deuterium lamp and narrow UV band pass filters with half-band widths of 10 nm. Using this equipment we studied UV-regulation of four different genes. Two of these were primarily regulated with a peak at 290 nm and below (with little or no regulation at 300 nm), whereas the other two were regulated at 300 nm and above (with little or no regulation at 290 nm) (Kalbina et al. 2008), pointing to two different mechanisms of UV absorption. The statistical analysis posed some problems and we could again rely on Lars Olof. Through his contacts at Lund University we got expert help. The late Jan Lanke, then Professor emeritus of biostatistics, solved the problems in discussion with Lars Olof and myself.

The collaboration on these issues also meant that Irina Kalbina, now a lecturer in my research group and the first author of the

second study above, got to know Lars Olof and his wife Gunvor well on a personal level. Irina had the opportunity to indulge in Lars Olof's and Gunvor's hospitality in their home, to savour Gunvor's soups and discuss common interests such as science, literature, music, history, and the philosophy of life. Irina also got the opportunity to discuss hands on scientific issues with Lars Olof during the course of the collaboration and when writing her doctoral thesis, the viva of which was very kindly visited by Lars Olof and Gunvor.

After retirement Lars Olof took up a part time Professorship at Shaoshan's Institute at South China Normal University where he stayed for about a dozen years and helped out to build UV Photobiology research.

Lars Olof as a role model in fundamental research

In my mind, Lars Olof personifies the virtues of some scientific qualities that are becoming more and more scarce among fellow researchers in today's quest for external funding and high citation rates, and frustration of showing enough signs of applied research and stakeholder interactions in our annual reports. These virtues are: i) a great interest in science in the wide sense, not only in the natural sciences and in technology, or in his own projects, but also in the projects of his fellow peers, and of scientific efforts in medicine, in the humanities and in the social sciences; ii) the lust of sharing scientific insights and interesting details to the general public and to students in particular; iii) a humble approach to his own persona and a curiousness of what his peers are up to and what they have learnt.

Thus, Lars Olof is a true representative of the very best of what fundamental research stands for ...or as this type of science has lately been termed by anglosaxon research policy makers: 'Blue Skies Research'. However, who would be a better guide to what hidden optical secrets 'Blue Skies' could re-

veal than Lars Olof himself?

Lars Olof and Swedish popular science

Lars Olof is one of the most important figures when it comes to popularizing science in his home country. He is a regular writer in “Forskning & Framsteg” (approximate translation: “Research & Progress”), Sweden’s most important popular science magazine. He is the one most published individual in this magazine, with more than 120 shorter or longer articles to his name (as found on the journal’s webpage). He also has his own blog on the same web site (<http://fof.se/person/lars-olof-bjorn>), where he writes in Swedish about many aspects of science and in a way that is easily understood by the general public. For his outstanding contribution, he did in 1984 receive the Rosén prize, the chief prize for popularization of science in Sweden. Lars Olof also writes about science in a popular way on his web page at Lund University (<http://www.cob.lu.se/photobiol/>), in both Swedish and English. During his time at South China Normal University he also had a web page in Chinese and he gave a TEDx talk (in English with Chinese subtitles). A Lars Olof ‘classic’ is his instruction for building “The poor man’s spectroradiometer” (<http://www.cob.lu.se/photobiol/poor.pdf>) using a cheap light source (a light bulb or a laser pointer), a DVD disc, a digital camera, a few pieces of wood and metal, a personal computer, and the Image J software. Since 1981 Lars Olof is a fellow of the Swedish Academy of Science, in the Class for Biosciences as member no. 1222.

With this I will end, thanking Lars Olof for his inspiration, his ample contribution to science, and wish him an active and fruitful future.

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