



CAPTURING THE SPIRIT OF WIKO:  
REFLECTIONS ON A 3-MONTH FELLOWSHIP  
AT THE WISSENSCHAFTSKOLLEG  
ORKUN SOYER

---

Soyer is currently leading an interdisciplinary research group in Systems and Synthetic Biology at the University of Warwick, where he is also co-director of Warwick Integrative Synthetic Biology Centre and Synthetic Biology Centre for Doctoral Training. He was born in 1975 in Istanbul and studied Chemistry at Bogaziçi University. After receiving a Ph.D. from the University of Michigan, Ann Arbor, Soyer held a postdoctoral research position at ETH Zurich and independent group leader positions at Microsoft Research – University of Trento Computational Biology Centre and the University of Exeter. Soyer's research interest is in understanding evolution and the dynamics of complex biological systems, ranging from intracellular signalling networks to microbial communities. His group combines evolutionary theory, dynamical systems theory and synthetic biology and uses both modelling and experimental tools. The on-going research projects in Soyer's group focus on synthetic microbial communities, host-pathogen interactions and cellular signalling networks. – Address: School of Life Sciences, The University of Warwick, Coventry, CV4 7AL, United Kingdom. E-mail: o.soyer@warwick.ac.uk

In late 2012, I received an invitation from Steve Frank to apply to Wiko to become part of a Focus Group that he was putting together there for the 2014/15 academic year. At the time, I was leading a small research group at the University of Exeter that focused solely on the computational modelling of biological systems. My research and work style were ideally suited to the idea of spending a year at an institution such as Wiko, and I was extremely pleased when my Fellowship application was accepted. Things changed quite drastically from that point on. In 2013, I was successful in securing funding for a large

synthetic biology project focusing on the engineering and understanding of microbial communities. This project has allowed my research to expand into combining theoretical and experimental studies. This was something I always wanted to achieve, but it still came as a big challenge. I had always interacted with experimentalists since my Ph.D. studies, but I had never run an experimental group. Thus, I found myself on a steep learning curve starting from the initial setup of a laboratory to establishing procedures for designing and conducting experiments, training staff and maintaining the day-to-day functioning of the laboratory. This process coincided also with my moving to the University of Warwick in a professorial position and taking on a leading role in the establishment of a synthetic biology research centre there.

These developments, as welcome as they were, also had a drastic effect on my work. Suddenly, my e-mail load went through the roof and the time I spent on meetings and managerial tasks skyrocketed. The time I could devote simply to thinking or reading papers evaporated. In this frenzy, I also realized that I could not commit to a full year of Fellowship at Wiko anymore and had to reduce my stay there to a mere three months.

How refreshing those three months were! The first week, I indulged myself readily by studying the thermodynamic basis of cellular metabolism and reading the rare textbooks that were made to appear from thin air for me by the resourceful Wiko librarian Sonja Grund. Over lunch, I was treated to the most excellent food prepared by Dunia Najjar and her team, accompanied with stimulating conversations with my Co-Fellows. Arriving out-of-schedule at Wiko had created an energy barrier to making contact with Co-Fellows, but soon the weekly colloquia and the Thursday dinners provided the needed activation energy. Before long, I was having lengthy and most enjoyable discussions on the establishment of the election system in Europe, the sky burial and mountain graves of Tibet, the evolution of musical tunes using computer algorithms ... and the list goes on. Back at our apartment, my wife and two children were enjoying a comfortable stay, with the kids having great fun polishing their German (and Turkish!) at the local primary. It all felt so right; this was the environment where science could be science, where a scientist was at peace and ease with life and all her or his energy could be devoted to thinking and learning!

To me, those first few weeks associated Wiko truly with its own catch-phrase; “time to think”. I remembered again the stable, devoted days of my postdoctoral research days and

embraced it. The clear-mindedness allowed me to develop a new Fellowship proposal,<sup>1</sup> which I was hoping to use to achieve a state of affairs, similar to what I had at Wiko, for a longer term and within my own institution. At the same time, I continued developing my research ideas on and study of cellular metabolism, using both evolutionary and thermodynamic perspectives. This was my proposed core work for my Fellowship at Wiko and it formed the main topic of my discussions with my fellow Focus Group members, in particular Steve Frank, Thomas Pfeiffer and Jan-Hendrik Hofmeyr. Trying to explain my emerging ideas and questions to them was a most productive experience, allowing me to sharpen these as they formed. I was able to extend these discussions relating to my own project with other colleagues in Berlin and established most valuable links with Ralf Steuer and Wolfram Liebermeister at the Humboldt University. During the last month of my stay, I was able to organize a mini-symposium with them at Humboldt, discussing research focusing on “design principles of cellular metabolism”.<sup>2</sup> The resulting discussions from that meeting are still being followed up and we are developing interesting ideas, particularly with Wolfram. Again, in the last month of my short stay, I was also able to invite one of my postdoctoral research associates into this productive environment, which allowed us to mostly finish a working paper on microbial diversity emerging from thermodynamics-driven inhibitions on cellular metabolism.<sup>3</sup>

Developing new ideas, studying cellular metabolism, writing a new article and a significant project proposal, as well as forming new collaborations, all packed into three months! I associated this high level of productivity directly with the uplifting and enhancing spirit of Wiko. How could it not be productive; despite some disruptive events relating to my homely managerial jobs pulling me out of my “place to think”, I still enjoyed an amazingly stimulating, carefree and supporting environment at Wiko. Being in that environment, I kept on coming back again and again to the same thought; “how modern academic life has moved so far from what it should be about”. This was also a common topic over lunch and dinner among the Wiko Fellows. Everyone had their own horror stories of the “real life” outside Wiko and how their intellectual energy is drained

- 
- 1 “Enabling the Engineering of Synthetic Microbial Communities.” 5-year career fellowship proposal submitted to the Engineering and Physical Sciences Research Council (EPSRC), UK.
  - 2 “Evolution and Optimality in Cellular Systems.” May 6, 2015, workshop co-organised with Ralf Steuer at Humboldt University, Berlin.
  - 3 “Microbial Diversity Arising from Thermodynamic Constraints.” Tobias Großkopf and Orkun S. Soyer, research article under review at ISME Journal.

by managerial tasks, e-mails and secondary work. My own reflection on this matter is that scientific work cannot be reduced to a specific time slot that can be allocated in between other tasks, contrary to what seems to be happening in many academic environments. We are increasingly getting used to “doing a bit of science” in between all of our other tasks. While it is true that academic life entails many elements, including managerial and other tasks, it is important that we do not accept the notion that scientific activity can be boxed into an allocated percentage of our time that can be slotted within a busy day of secondary tasks. I do not think that we can expect a scientist to be productive, novel and inspiring while her or his mind is constantly bombarded with secondary tasks during a working day. We need to fence off an intellectual and physical space that allows us to think, develop, explore and conduct science.

During the three precious months of this year, I felt privileged to be at Wiko and to enjoy exactly such a space. So much so, that I wanted to take the spirit of Wiko back with me and implement it in my “real” environment. Since my short stay at Wiko I have been trying to organize my busy workload such that I can have at least a day a week without e-mail or dedicate a day solely to reading. It is not proving easy. After all, I am not at Wiko anymore! However, I will continue trying to make the spirit of Wiko a part of me. This, to me, is extremely important to remain a productive, original and inspiring scientist.