



THE LASTING IMPACT OF WIKO ON  
CREATIVITY AND MEMORY PROCESSING  
FROM A NEUROSCIENTIST'S PROSPECTIVE  
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Biology has revealed that memory, creativity, and decision-making are supported by distinct neural circuits in the brain that can be influenced, either enhanced or hindered, by the presence of certain neuromodulators produced in our bodies. These modulatory chemicals are produced in response to specific experiences, and when present they can have lasting impact on brain function, with certain brain circuits more readily influenced by their presence than others. I have dedicated my research to understanding how the

collective activity of brain cells in our memory centers computes information that we perceive as thoughts and memories and that guide our actions. These brain circuits are specifically impressionable and easily modified by neuromodulators when present. It appears that Wiko has carefully considered current neurophysiology research and painstakingly created an environment specifically designed to activate the enhancing brain modulators needed for creative intellectual productivity. Their protocol is to place the specimen, a Fellow such as myself, in an idyllic location, with immediate access to nature on the one hand and a vibrant ever-living city on the other. They provide excellent food, coupled with an instant community committed to dedicated time together in facilitated social interactions. This separation from our typical demanding academic environments is in itself an immediate stress reliever. All of these factors have been shown individually in a laboratory setting to induce memory enhancers and suppress modulators that are negative, setting up an environment geared towards priming the brain circuits that mediate memory and creativity for optimal function. Moreover, one of the most significant catalysts of enhancing molecules that has also been shown to spur new brain connections is novelty – a diversity of new experiences. In brain research using model organisms, these are called “enriched environments.” They have the capacity to increase the number of new neurons needed to increase memory capacity and to strengthen brain connections already formed that are required to retain memories for the long term. If the science is right, Wiko has curated and combined these brain-enhancing factors into an “enriched experiment” that should be the cocktail needed to cultivate new ideas and inspire creativity among its subjects. Does it work? What are the outcomes?

My decision to become a part of the Wiko experiment, to place myself within the ultimate “enriched environment” curated by the collection of world-class individuals diverse in their thinking, experience, origins, and social constructs, has had immediate and long-lasting impacts on my scientific research, as well as on my own personal growth and happiness. The scientific outcomes are more directly measured. As an experimental neuroscientist whose lab collects large data sets on neural activity, the level of understanding we can gain from such data depends on the computational tools available to explore the data. Collaborations with computational neuroscience laboratories have the potential for innovation, and I have set this goal to expand my lab’s current capabilities. The interaction can also be reciprocal, so that the more we understand how the brain solves problems and computes information, the better we are able to improve computational models and improve network algorithms inspired by the brain (i.e., the development of recent

advancements in AI). Germany is a hub for computational neuroscience and renowned for its prestigious computational institutes, such as the Bernstein Centers for Computational Neuroscience, which are scattered across the country, including in Berlin. Wiko provided the space and time that allowed me to discuss projects with computationally minded Fellows and to invite and establish collaborations within the larger computational community. Established German collaborators were invited to stay for extended periods of time to join the Wiko “enriched environment” and work with me on my proposed Wiko project. The situation was ideal, and the environment transformative for these types of creative interactions. In that time period supported at Wiko, we were able to analyze complex data that revealed important and unexpected computations from the brain, explaining the mechanisms for how neurons in memory centers retrieve past memories to inform and then execute future decisions. Computational models were then tested from artificial networks we built to mimic the computations of the brain we discovered (code published on GitHub<sup>1</sup>). We could then use these artificial networks, which we confirmed behaved like our brain circuits, to test many variables in order to point us towards likely cellular mechanisms and new hypotheses we can test experimentally. From this creative work we wrote a manuscript of our findings and submitted it for scientific review before leaving the Wiko campus. We also were able to turn our new hypotheses into a grant application to the Collaborative Research in Computational Neuroscience initiative, funded jointly by the US National Science Foundation and the German Federal Ministry of Education and Research.<sup>2</sup> Large funding of this scale will allow for continued collaborative work for many additional years. The impact of this creative work also is evident from the recent news that our submitted manuscript has been accepted for publication<sup>3</sup> after peer review in the journal *Nature Communications*, the open access journal of the prestigious *Nature* publishing group. This is among the top journals for the publication of

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- 1 Custom codes are published and freely available from a *GitHub* repository, <https://github.com/cleibold/CA3phaseprecession>, and from *Zenodo*, [doi.org/10.5281/zenodo.13907008](https://doi.org/10.5281/zenodo.13907008). Custom code was created to analyze the data and create the computational model presented in Ahmadi et al. (2025), *Nature Communications*, see footnote 3.
  - 2 NSF-24-510. CRCNS US-German Research Proposal: Neural-network mechanisms of learning: The role for sequence plasticity. J. K. Leutgeb and C. Leibold, Proposal # 2424006.
  - 3 S. Ahmadi, T. Sasaki, M. Sabariego, C. Leibold, S. Leutgeb, and J. K. Leutgeb (2025), “Distinct roles of dentate gyrus and medial entorhinal cortex inputs for phase precession and temporal correlations in the hippocampal CA3 area,” *Nature Communications* 16: 13.

scientific research across STEM disciplines. Wiko is listed as an affiliation in this publication. These outcomes support the conclusion that the Wiko “enhanced environment” worked to free my mind from restrictions, thus allowing me to focus on creative problems, and then provided the environment that would enhance those efforts, resulting in measurable creative outcomes.

For a scientist who spends their life in the laboratory it may seem like a career barrier to leave the laboratory and the collection of data for more intellectual pursuits. However, from my experience, if you prepare your lab for the absence, it will free your mind to produce many new creative hypotheses that you can then take back to your lab with and pursue for many years to come. Removing ourselves from the typical daily demands and stepping into novel and creative spaces can work even for scientists dedicated to lab research if they can leave behind a productive team that they can guide from afar. The situation at Wiko was transformative for my creative process, but it also has the power to be transformative for the scientific community in the local area. At Wiko, interactions between local laboratories and world-class scientists collected from abroad can introduce new partnerships for collaboration, a process that is easier and more natural when people are within the same space. The measured outcomes of my experience are direct results of this potential.

The personal outcomes of the Wiko-induced brain state, high on enhancing brain chemicals, may not be as directly measured from a curriculum vitae, but perhaps for me are the most salient and memorable. Some of the discussions with the most impact that still persist in my immediate memory are those between friends during rainy walks in the Grunewald forest, across a table with a few bottles of sparkling water, and on a wicker Bauhaus chair in a restored turn-of-the-century villa. The personal interactions were for me the most important and in a sense most unexpected reward from the Wiko experiment. They are what I crave after leaving Wiko and what I miss when returning back to the confines, both physical and intellectual, of my research laboratory. I was exposed to unique theories, ways of thinking, problems, and challenges. I was inspired by uncommon solutions and creative works of art and music, and surprised at times by the differences in academic experiences and demands between the life sciences world and the social sciences world. The exposure I received at Wiko to world-class thinkers and creative people was one of the greatest rewards of my experience. The challenging discussions and new friendships are personal measured outcomes that reflect a successful outcome of this experiment on my personal journey. Couple this with access to a rich and dynamic city that feeds off of its own energy: the experiment worked for me!