



Swiss Society for Neuroscience (SSN)

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Editorial

The main event for the SSN during this first trimester of 2005 was of course our annual meeting in Zürich. For the first time, our “one day” annual meeting taking place on a Saturday was replaced by a “two day” joint meeting together with the USGEB (on Thursday and Friday February 17-18th), followed however by our traditional “one day” meeting with a clinical society, the Swiss Society of Biological Psychiatry (on Saturday February 19th). Altogether, it was a widely shared opinion that the scientific level of the meeting was excellent, in particular some brilliant plenary lectures, which would have deserved a somewhat more numerous attendance. The issue of future collaboration of the SSN with the USGEB will certainly be one of the many strategic issues that the SSN council will have to evaluate in the future in order to pursue the development of our society.

On the occasion of the SSN annual meeting, the council of the SSN was partly renewed. Two members of the council, H.R. Lüscher and P. Sonderegger, finished their four-year term, and three officers left the council at the end of their mandate, namely D. Müller (secretary, 2003-2004), C. Bassetti (treasurer, 1998-2004) and J.M. Fritschy (president, 2002-2003). In the name of our society, I would like to warmly thank these colleagues for their enthusiastic engagement for the SSN during these past years and having thus contributed to its spectacular development. Four new members of the council were elected: Anne Zurn, Andreas Lüthi, Christian Lüscher and Jozsef Kiss. It is a pleasure to welcome them in the council. They will certainly bring new ideas for developing our activities. On the occasion of the next SSN council meeting (April 2005), in line with the by laws, the fourteenth member of the SSN council will be co-opted.

Eric M. Rouiller

SSN Annual Meeting 2005

The joint meeting SSN – USGEB – SSBP took place on February 17-19th, 2005 at the ETH in Zürich. The SSN council is grateful to the local organizers, in particular Prof. M. Peter and our former president Prof. J.M. Fritschy, for having put together a scientifically very rich meeting. On the point of view of the SSN, the “three day” joint meeting had the advantage to maintain our traditional aim of merging basic and clinical research in the field of neuroscience on Saturday and, in addition, to offer to our members on Thursday and Friday the opportunity to interact with basic researchers of other fields. Moreover, as usual, emphasis was put on young scientists, for instance with the “best poster award” attributed on each of the three days of the meeting to three outstanding poster presentations. The list of awardees can be found on the web site of the SSN, in addition to the possibility given to our members to download the abstract book of the annual meeting.

Next year, due to the FENS meeting 2006 in Vienna, the national Neuroscience Societies are invited to not organize major national meetings and, for this reason, the SSN will come back to the standard annual meeting limited to a single day. The SSN annual meeting in 2006 will take place in Basel, on January 28th, in collaboration with the “Swiss Society of Neuro-Radiology”. The SSN council looks forward to seeing you in Basel.

FENS 2008 in Geneva

Although this seems a far away event, the preparation for this major SSN challenge has already started, under the supervision of Prof. Ann Kato, who kindly accepted the position of President of the local organizing committee. Recently, Ann Kato met the organizers of the FENS 2002 and 2004, as well as the colleagues of Vienna in charge of the organization of the FENS 2006. Surely, Ann collected highly useful information for us. I take this opportunity to emphasize the notion that the FENS 2008 meeting should in no case concern exclusively the “lemanic” neuroscience community, but instead the entire membership of the SSN, irrespective of the geographical location. The dimension of this event is such that it is a unique opportunity for a large promotion of neuroscience in Switzerland, particularly in the public. I hope that the FENS 2008 meeting in Geneva will represent an additional motivation for all neuroscientists in Switzerland to

join the SSN and help us in the organization of this European meeting. Along this line, a quite stimulating objective would be to reach the magic number of 1000 SSN members in 2008 (we are presently about 730 members). To reach this goal, the SSN council invites each member to actively encourage students and other colleagues who are not yet members to apply for membership, a very easy procedure through our web site. You will be regularly informed on the progress of the organization of the FENS 2008 meeting and be ready, at some point, to be recruited by the local organizing committee to contribute in one way or another.

SSN web site

A new layout of the SSN web site has been introduced in spring 2004, representing a very efficient tool to communicate information to the SSN members. It is my personal opinion that we are progressively invaded by an uncontrollable number of e-mails. The SSN will not contribute to such an unpleasant situation. Accordingly, I will try to send circular e-mails to the SSN members as rarely as possible. As a consequence, it is crucial that SSN members take the habit to regularly check our web site in order to find out about the deadlines of various offers (e.g. travel fellowships, “best publication award”) and about news (meeting announcements, continuous education training courses, Ph.D. student day, etc). We can thus expect that the number of visitors to our web site (presently 70 per day on average) increases. In the future, the SSN newsletters will not systematically be sent to each member by attachment. Again, the SSN members will have to access the web site to download the SSN newsletter, which will appear four times a year, approximately around April 1st, July 1st, October 1st and December 30th.

Eric M. Rouiller

Meeting announcement

The European Brain and Behaviour Society Meeting

Dublin, Ireland, September 24-28, 2005

www.EBBS2005.com



The “**SSN Best publication award**” was attributed to Dr. Rodrigo Salazar for his paper entitled “Effects of training on neuronal activity and interactions in primary and higher visual cortices in the alert cat” published in **J. Neurosci. 24, 1627-1636, by Salazar R., Kayser C. and König P. (2004).**

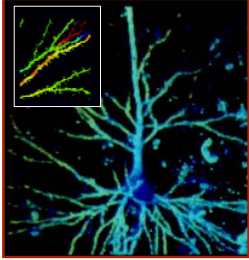
Below, Dr. Salazar presents a brief survey of the significance of his work.

Entering the cortex, learning begins...

A common belief in neuroscience has been that sensory areas lose their plasticity in adult animals. However, in the last two decades, this assumption has been strongly challenged. The pioneering work of Merzenich and collaborators played a crucial role in this process. They demonstrated that if animals were trained to discriminate auditory or tactile stimuli, the representations of those stimuli could be altered. Such a finding would not be surprising in high sensory areas but it was surprising that they were occurring in low cortical levels such as in the primary sensory areas. Can this finding be generalized to other sensory modalities? Surprisingly, such evidence has not yet been reported for the primary visual cortex. In the last couple of years, a number of studies addressed this issue but with little success. These studies used a traditional approach, which consisted of measuring one neuron at a time, and in quantifying the frequency of action potential or firing rate. However, this approach does not enable investigations into the more subtle properties of the system such as its temporal dynamics. Therefore, we hypothesized that it is not the firing rate but the temporal dynamics of neurons that is the malleable feature of the primary visual cortex. By performing multiple simultaneous recordings, we also investigated whether other types of changes occurred further down in the visual processing stream. We were able to analyze local field potentials, multi- and single-unit activity in two visual areas to assess the temporal dynamics and the interactions of populations, as well as single neurons. As a consequence, the results show a dynamic, interactive and plastic view of the visual system, even in the primary visual cortex. Our results suggest the presence of specific interactions in the cortical hierarchy between synchronous oscillations and spiking discharge. These findings provide interesting insights into visual processing and show the importance of behavioral learning in this process. They provide a new dimension to the doctrines of rate and temporal coding, and instead emphasize their interactions instead of their oppositions. They further complete the emerging picture of mature sensory systems and their functional plasticity. Concluding, the cortex is a gold mine--obscure, attractive and impalpable but always learning.

Rodrigo Salazar

A Short Comment on Plasticity – with a Look into History



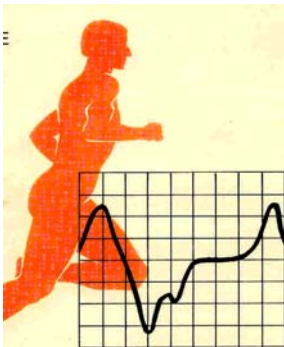
Plasticity is currently a major field in neuroscience. Since the early 1980ies, micro-mapping studies demonstrated the power of sensory or motor cortical areas to reorganize the size and distribution of representations as a consequence of imposed altered sensory inputs or movements. Another line of investigations consisted in *repairing* lesioned neural tissue with methods of molecular-cellular biology. Successful regrowth of lesioned fibres, establishing new connections, has now been reported and constitutes a major breakthrough in neuroscience.

In a preface of a book on "Brain Repair", the editor D.G. Stein made the following comments:

"...it has only been since the early 1980s or so, when more evidence for plasticity became available, that any research has been devoted to finding new treatments for brain damage. Even now, many physicians still believe that instances of recovery after brain damage can be explained by the fact that patients simply learn special 'tricks' or new strategies to cope with losses in function. These tricks then mask or camouflage the real deficits, which would be seen if careful testing were done to reveal them."

My short message is: *yes for repair, but also yes for physical rehabilitation!*

As early as 1897, the eminent neuroscientist Constantin von Monakow, Professor in Zurich, suggested the occurrence of collateral sprouting from damaged fibres in brain lesions. In the famous monograph "*Gehirnpathologie*" (924 pp!), Monakow discussed the likely cause of functional restitution after brain lesions (which led to his "*diaschisis*" theory). After acute lesions (e.g. strokes), the initial deficit is typically followed by a partial recovery, but almost always with a "Restdefizit". He, probably for the first time, envisaged that lesioned fibres generate new collaterals that try to find their lost target structure, suggesting that collateral sprouting may reinforce functional restitution. In the early 20th century, Cajal (see "*Cajal on the Cerebral Cortex*" by de Felipe and Jones) makes due mention of Monakow's ideas. By now the technique to follow axons and their collaterals had much improved, thus providing a deep insight into the role of collateral sprouting during development and post-lesion restitution ("...the healthy cut end is capable of growing and emitting new collaterals which, in running through the damaged regions, establish contacts with the disconnected neurons"). But interestingly, Cajal -like Monakow- emphasized also the important role of physical exercise in rehabilitation, insisting that physical and mental activities must be used steadily and as much as possible, particularly during development, after brain lesions (and also in old age!). It implies that neural fibre growth and steady use of the neural resources ("brain gymnastics") may interact.



Albrecht Bethe (1872 – 1954) is remembered for his wrong claim that neurofibrils transgress cellular boundaries thus contributing to intercellular networking and coordination. More importantly, however, he had also made many most interesting experimental observations about the coordination of body parts that are changing from moment to moment. This is a dynamic process, which he termed *principle of gliding coordination* (Prinzip der gleitenden Kopplung): body parts are not directed from isolated brain centers but rather by distributed networks to constantly adapt to

the changing needs for shaping body movements in goal-directed movements. This comes near to present thoughts about motor control and coordination. He wrote much on plasticity, as far back as the 1920ies, being then already called "*the father of plasticity*." Plasticity indeed has a long history!

Mario Wiesendanger (Physiology Institute, University of Fribourg)