

## ANNEX III

### DR. ARTHUR KONNERTH - PERSONAL INTERVIEW

1. Dr. Konnerth, why did you study Medicine?

Actually, I started out by studying Physics and Electronics. I switched than to Medicine because of my interest in biophysical research.

2. Your postdoctoral research was done at universities in the USA and at MPI for Biophysical Chemistry in Göttingen. Do you recommend scientific stays abroad?

Absolutely, stays in other labs are an essential step for the personal development of most people.

3. As a scientist, you try to achieve a better understanding of the mechanisms underlying learning and memory. What great question would you like to solve?

I just want to find out as much as possible on how the brain works.

4. Alzheimer's disease is the most common form of dementia. There is no cure for this pathology, which worsens as it progresses, and eventually leads to death. Why is it so hard to find a treatment?

I wish I knew the perfect answer... I guess that a major problem is that in addition to the reasonably well understood cell biology of the amyloid pathology; a major there are not understood, multifactorial chronic issues associated with aging (e.g. inflammation, vascular problems).

5. You mentioned that "the brain is a rhythmic machine, producing all kinds of rhythms all the time. These are clocks that help to keep many parts of the brain on the same pace". This sentence sounds like poetry... what does it really mean?

The issue is that during early development, before the brain integrates processes sensory information, there are intrinsic oscillations that involve all neurons. This fundamental rhythmic activity plays an important role in coordinating development, by making sure that various cell types (e.g. excitatory cells, interneurons) grow at the same pace.

6. Synaptic plasticity modifies information flow in the brain and thereby, consolidate memory traces. Which techniques could be used to study this physiological change?

This will not be a single technique, but will require the analysis of neurons, circuits and behavior.

7. In 2012, the European Research Council awarded you with a grant to study synapses and sensory information in the brain in vivo. What progress has been made on this project?

We are in the process of developing the tools for imaging synapses in all cortical layers of the mouse brain.

8. You currently work in the Technische Universitaet Muenchen, in close collaboration with physicists and engineers. Is direct relationship among professionals from different backgrounds simple, or do they speak different languages?

Generally, if scientists from different fields agree on the same goal, communication is no major obstacle.

9. The European Commission launched the Human Brain Project last year with the ambitious goal of turning the latest knowledge in neuroscience into a supercomputer simulation of the human brain. Is it a realistic approach or does it arrive too early?

The future will show us if this money was well spend. I, myself am not a part of the project.

10. In addition to sustained funding, what are the main research challenges in coming years?

The challenges are different for different people and not even funding is the main problem. With sufficient enthusiasm and creativity there is always a way of doing interesting things.