There were 95 participants in the meeting entitled: "cortical development in health and disease". There were 58 young investigators, 61 from different countries and the rest from Israel. The participants arrived from Japan, China, Australia, India, Brazil, USA, Canada, UK, France, Belgium, Italy, Greece, Germany, Spain and Israel.

The meeting entitled: "cortical development in health and disease" contained a well balanced mixture of talks presenting ground breaking basic research that was complemented by clinicians actively engaged in research that presented their unique perspective on cortical development. Professor Arnold Kreigstein's talk opened the first session of the meeting. Professor Kreigstein is heading a group busy in understanding the events that undelay human brain development. Until recently the main bulk of scientific advances in cortical development was achieved by studying mouse models, limiting our ability to understand the unique events that shape the human brain. Prof. Kreigstein is pioneer in describing and comparing mouse and human brain development. Professor Kreigstein described the evolutionary expansion of a proliferative zone, the oSVZ. The expansion of the human neocortex is attributed to the relative abundance of neural stem cells in the fetal brain residing in this area, the outer radial glia (oRG). oRG cells display a characteristic division mode, which was dubbed mitotic somal translocation (MST). MST is a rapid translocation of the soma toward the cortical plate immediately prior to cytokinesis. Professor Kreigstein was able to describe the molecular motors and signaling events that are necessary for this movement to occur. In addition, he had descried a bioinformatics endeavor aimed at the identifying key developmental genes unique to humans. A different innovative approach to study human cortical development was presented by Madeline Lancaster. Dr. Lancaster had developed a method that allows her to mimic the early stages of human brain development *in vitro*. She described her advancement in producing three dimensional cerebral organoids, or mini-brains, originated from human stem cells. This technique when combined with reprograming patients-derived cells or genetically edited hES cells, allows scientists to overcome the limitations of using mouse models to models of developmental diseases such as microcephally- small brain. Professor Yechiel Elkabetz from Tel Aviv University, is attempting to decode the heterogeneity of pluripotent stem cell (PSC)-derived neural. Like his colleagues, Professor Alkabetz also deals with stem cells of human origin, thus contributing to the expansion of our understanding the developmental processes that apply to human stem cells. He had described a dynamic stage-specific transcriptional patterns distinct progenitor identities that are controlled by chromatin remodulation and microRNA expression. His system allows Professor Alkabetz to detects dynamic events that reflect those occurring throughout human neurogenesis. Professor Wieland Huttner that participated in the opening session of the conference was able to classify and characterize the genetic profile of the different populations of stem cells in both human and mouse cortex, and display characteristic combinatorial code that defines each population's identity. This approach allowed Professor Huttner to pinpoint at critical genes that may contribute to the significant evolutionary expansion the human cerebral cortex underwent. One fascinating example that arose from this study is ARHGAP11B. ARHGAP11B promotes basal progenitor amplification and neocortex expansion and its ectopic expression in the mouse create a gyrated cortex. Prof. Denis Jabaudon presented a new technology that allows researches to snapshot the developing

brain. The "Flash Tag" that enables short-term labeling of cells during brain development, has many advantages. The dye incorporates in a specific and defined and extremely short time window. This allows visualization of a single developmental continuum questions that so far remained open regarding the acquisition of cell identity during development, can now be addressed for the first time. Shubha Tole's talk was also concerned with the acquisition of functional regional brain identity. She described the "road map" that emerges in the early stages of development and is refined by a number of organizing centers in the cortex. Simon Hippenmeyer uses Mosaic Analysis with Double Markers (MADM) as a mean to generate genetically mosaic mice, in which singles cells are labeled with different fluorescent markers that represent their genetic modification. This powerful tool not only enables analysis of gene function at the single cell level *in vivo* but also enables Dr. Hippenmeyer, to identify the progeny of single cells and to numerically understand the relationship between mother cells and its progeny. The last three talks in this session given by Francois Guillemot, Grey Wilkinson and Ruth Ashery-Padan described different aspects of transcriptional pathways and their role in generating different neuronal identity during cortical development.

The plenary sessions on cortical development in health and disease included many clinical presentation. Abraham Fainsod described his latest findings on FAS- Fetal Alcohol syndrome. He explained on a biochemical level the resons for the harmful effects of alcohol consumption during pregnancy the fetus brain development. He also described mouse model for retinoic acid deficiency, which carry a mutated CYP26A1 and is a viable model for FAS, recapitulating many of the aspect of the syndrome in human fetuses. Special sessions were devoted to Autism and Eplispsy where investigators from different countries contributed (Yehezkel Ben-Ari, Ingrid Schefer, and more).

Overall this was an exciting meeting which provided a comprehensive overview on the current novel findings in the field of cortical development in health and disease.