



News Review

Hot Topics of Hematology Research: Investigators from University of Munich Release New Data

With this banner title the journal *Health and Medicine Week*, 15 Feb 2013, reports the publication *Acta Haematology* (2013; 129:159)*. The success of this investigation is the result of a cooperation between LMU Munich and TU Munich, that started in the Medical Physics Department, Helmholtz Research Centre, Oberschleißheim, led by Dr. Georg Burger. This publication has also been cited as a Scholarly Article in *Blood Cells – Advances in Research and Application* (ed: Ashton Acton) published by Scholarly Edition, Atlanta, Georgia, 2013, Chapter 4, p. 134.

This work was nominated for the **Wiley Foundation Prize** from the Medical Genetics Department, MD Anderson Cancer Center, Houston, Texas with the support from three European universities, because it touches the frontiers of knowledge in Genetics and Haematology and affects positively the diagnosis and therapy control that may lead to cure or prevention of genetic disorders like cancer, as elaborated in a recent report (*Medizinische Genetik* 2015, 27(1):160-161).

This 2013 article says that each of the two parental sets of chromosomes representing the maternal and paternal genomes form an exclusive entity in a cell nucleus, each with their own centriole. They work together like a team in a mixed doubles tennis match, unless under epigenetic constrains. In leukocytes they impart the segmented nucleus a bilaterally symmetric form and foster more efficient chemotaxis to rush the granulocytes to the focus of infection to install immunity.

These findings answer a 130 year long debated question on the order of chromosomes in a cell nucleus. Carl Rabl (1885) said, “Ordnung muss sein,” while David Comings (1980) commented that in mammals and humans “no order is discernable.” Current trends, led by Thomas Cremer, still simply support the opinion of David Comings.

This genome-wise order of the maternal and paternal sets of chromosomes, as described here, may now change the landscape of Genetics substantially, for example, by upgrading the

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tools of genetic diagnosis and therapy control, as well as our understanding of the mechanisms of epigenetics and that of dominant and recessive genes.

In this context it is also worthwhile to confer the recent works like Cherniak and Rodriguez-Estaban (*Mol Cytogenet* 2013, 6:61) on Body maps on the human genome and Reinius and Sandberg (*Nature Rev Genetics* 16, 653-664, 2015) on Random monoallelic expression of autosomal genes.

Further support for these new data on haematology is brought by Anja Weise with a team of experts from four universities of three continents applying the pod-FISH (*parental-origin-determination* FISH) and covering different cell types from patients and other mammalian species (*Molecular Cytogenetics* 2016, 9:36-47(DOI 10.11867s13039-016-0243-y).
