**Mathematical Modeling of Human Body System in a Transcontinental Collaboration in Health-Intent Research and Development1**

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**Abstract**

**Background and Aims:** Since 2007, I am designing a framework of Transcontinental Collaboration in Health and Academic Medicine across Eurasia (EurAsian T-CHAM). In 2010 to 2011, I could complete motivation phase visits in the seven regions of Russia and China that I had selected preliminarily. In November 2010, I convened named scientists from China, Russia and Germany to First EurAsian TCHAM Conference and EARTHMed NEURO 2010 International Conference in Düsseldorf. A consensus was reached to elaborate a plan for EurAsian collaboration on molecular profiling of disorders and inter-ventions and mathematical modeling of human body system towards future algorithmic medicine.

**Method:** Instead of more common task-splitting cooperation between two or three institutions and a sizeable number of individual scholars, a stratified “massive brain” and load-sharing approach with some national stratification and regional “concentrations” is adopted. With a 2013 Year of Mathematics’ present focus on Chapter 1 “Mathematical bio-systems modeling”, a holistic systems approach to the modeling of the human body is suggested. It starts from a system engineering point of view and reverses the paradigm underlying bionics, from understanding biology to innovative technology: from the logic of total complex man-made systems understand the logic of the total human body system.

**Result to date:** Chapter 1 is divided into three sections: (1.1) mathematical systems modeling, (1.2) biological systems theory and (1.3) statistics in systems modeling. Mathematical modeling from an engineering point of view implies to invoke automation and system design experts, as well. Biological systems theory from a holistic perspective will also consider pertinent theories in medicine in China and in Germany. Mathematical statistics has to develop the methodology for testing hypotheses derived from whole-body models in human populations and provide guidance in successive refinement. The first set-up steps are (i) formation of a Chinese-Russian-German work group in the above-mentioned design, (ii) a joint training program for young talent finally conducted in three “academies of transcontinental health”, and (iii) coordinated national boards of supervising academicians.

**Biography**

1965-1971: Study of mathematics, Free University Berlin 1971: Dipl.-Math. (M. Sc. Mathematics) in functional analysis, 1971-1976: Scientist, Medical Statistics and Documentation (Head: Prof Koller), Mainz University 1977: Dr. rer. nat. (Ph.D.), in probability theory (Prof WBühler), Mainz University, 1977-1980: Scientist, CIBA-GEIGY AG, Basle, Switzerland 1981-1982: Senior scientist (Project Leader), Medical Statistics and Documentation (Head: Prof Repges), Technical University (RWTH) Aachen 1982-1988: Position for qualifying research, Medical Biometry (Head: Prof Dietz), Tübingen University 1984: Habilitation (qualification to lecture), Tübingen University (Dr. rer. nat. habil.) 1985: Venia legendi (unbudgeted lecturer) 1986: Professor (unbudgeted) appointed by State of Baden-Württemberg 1988: Full professor, Statistics and Biomathematics in Medicine, Düsseldorf University, appointed by State of North-Rhine Westphalia. Professor Mau is managing director of the Institute of Statistics in Medicine; he teaches epidemiology, medical biometry and medical informatics.