Davor Solter is Awarded the Most Prestigious Medical Prize in Germany

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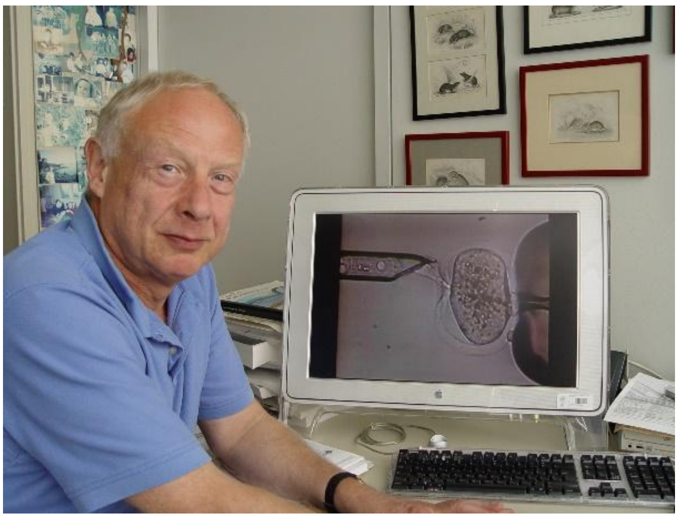
The most prestigious medical prize in Germany - The **Paul Ehrlich and Ludwig Darmstaedter Prize** is traditionally awarded on Paul Ehrlich›s birthday, March 14, in Frankfurt, and it has been awarded since 1952. It honors scientists who have made outstanding contributions in the field of research represented by Paul Ehrlich, such as immunology, hematology, or cancer research. The prize is financed by the Federal Ministry of Health, the German Association of Research-Based Pharmaceutical Companies and donations from the companies, foundations and institutions. With great pride I report that this year's laureate is Prof. dr. sc. **Davor Solter**. Born in 1941. in Zagreb, Croatia and educated at School of Medicine University of Zagreb, where he graduated and obtained his PhD in 1971. in biological sciences under the mentorship of prof. dr. sc. Nikola Škreb. Later on, Solter moved to USA where he was involved in research on Wistar Institute in Philadelphia.

Prof. Solter is Director Emeritus of the Department of Developmental Biology at the Max Planck Institute of Immunobiology in Freiburg, Germany, which he led from 1991. to 2006. Now a U.S. citizen he lives in Bar Harbor, Maine (USA) and is Visiting Professor at Mahidol University Bangkok, Thailand, and the University of Zagreb Croatia. Together with Solter the prize is shared by Azim Surani, a British citizen born in 1945, Director of Germline and Epigenetics Research at the Gurdon Institute at the University of Cambridge and a Fellow of King's College, Cambridge. The two developmental biologists discovered the phenomenon of genomic imprinting. The research they carried out in the early 1980s, demonstrated that for normal development in mammals both sets of parental chromosomes must be transmitted to offspring in their completeness. The mammalian evolution thus ensured a healthy balance of gene activity and evolutionary fitness of inherited genomes. Solter in Philadelphia (USA) and Surani in Cambridge (UK) by discovering the need of the full genetic input from both mother and father for offspring to develop normally, shook the foundation of classical Mendelian genetics and pawed the way for the field of epigenetics. The field of epigenetics could best be explained as heritable changes in gene activity and function that occur without altering the underlying DNA sequence of our genes. The difference between genetic and epigenetic is that the genome is fixed and stable, while epigenetic is plastic and depends on the micro- and macroenvironment.

Moreover, Solter's pioneering work on genome imprinting resolved the old debate whether traits are determined by genetics or environment and life style, the so called „*The nature versus nurture*" debate. "Nature" refers to the inherited genome, while "nurture" relates to all external, environmental factors expanding all the way to include learning, experience, upbringing and culture. So, now we understand that complex crosstalk of both nature and nurture contributes in shaping an individual's biology.

So, what is really behind the genome imprinting and epigenetics? Specific molecular mechanisms include DNA modification and remodeling of chromatin structure. Methylation of cytosine residues at specific positions in DNA is the primary molecular modification in epigenetics. In addition to methylation, epigenetic mechanisms also include post-translational histone modifications, chromatin remodeling, and RNA interference. The maintenance of methylation patterns consisting primarily of tiny methyl groups attached to one of DNA's A,T, C and G in specific genes is an important molecular mark of genomic imprinting. This molecular mark prevents that genetic information of the imprinted genes is active in the embryo. In fact, most known imprinted genes – and there are approximately 200 known in human genome, – are involved in balancing growth signals and brain development. How-



ever, not all imprinted genes are functioning solely in development, adults have imprinted genes, too, and they influence health and disease. Briefly, adult human imprinted genes are a group of genes with monoallelic expression which depends on gene's parent-of-origin, and is maintained throughout life by epigenetic marks.

Since the original experiments in the 1980. the field of epigenetics proved to be highly important for biomedicine. Human diseases involving disorders of genomic imprinting include Prader–Willi, Angelman, and Beckwith–Wiedemann syndromes. Methylation defects have also been associated with cancer and male infertility, and are thought to contribute to epilepsy and autism.

Thanks to the ingenious work of Solter and Surani, epigenetics is now rapidly expanding field offering promising prospects of epigenetics-oriented therapeutic strategies while numerous epigenetics-targeted drugs are undergoing clinical trials.

References:

https://www.ie-freiburg.mpg.de/6058738/2025_09_16_Davor_Solter_Paul-Ehrlich-Ludwig-Darmstaedter-Preis_2026_en

https://www.goethe-university-frankfurt.de/96892183/Main_Prize___Prize_Winners#a_96892183-6a5df656

Damjanov I. Davor Solter – Interview. RAD Medical Sciences 547 (54-55) : 138-147, 2021.

Pećina-Šlaus N. editor. Medicinska biologija, Medicinska naklada, 2024.