Wilhelm Jan Ansorge

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Wilhelm Jan Ansorge	
Nationality	**German-Czech**
Alma mater	**Charles University of Prague**
Occupation	**Scientist**

Wilhelm Jan Ansorge is a German-Czech scientist,[1][14][26] former director of the Functional Genomics Technology Department at the EMBL, the European laboratory for life sciences, novel techniques, and databases.

Working on scientific instrumentation, techniques, and software, for biomedical research,[33][35] he developed the first automated technology for DNA Sequencing[29][30] with high accuracy methods for genome sequencing and mapping, reported at the launch of the Human Genome Project.[17] The technique and methods were in the following years used for generating the first sequence of the human genome [28][17][27] and selected for the first planned private genome project.[21]

In 1991, he introduced the principles of two high throughput methods, Next-generation DNA Sequencing with convertible terminators[19] as in modern sequencers, and the principle of the DNA Chip Array technique.[19] After the publication of the genome sequence, his team produced the first complete Human Genome Array,[7][34] **[42]** allowing parallel analysis of multiple human gene expression profiles for complex projects in biology, medicine, and pharmacology.[44][45][61][62]

Using “Single-Cell as a Laboratory,” he designed Automated Microinjection with Image Analysis of Single Cells,[15][43][57] and Electro-transfection technique,[38] facilitating large-scale studies of DNA, RNA, and proteins in cellular processes.[42][43][58][59][61]

Since the EU award of the first European Chair[24] in 1993, he has been mediating over 30 years of scientific exchanges and education in Europe[25][48] EMBO and FEBS courses and Ph.D. programs.

In 1996, Ansorge was one of the founders of Lion Biosciences,[36][37] a biotech company listed in 2000 on Nasdaq. He applied for and was granted over 30 patents in genomics and technology,[11] the commercial devices[30][43][57] which have been used in biology research and clinical laboratories worldwide.

Earlier in his career, he worked in the development of superconducting magnets for particle accelerators[60] and semiconductor technologies, which were later applied to the miniaturization of biomedical techniques.[7] [19][34][59]

Education

Ansorge was born in Jablonec nad Nisou, now the Czech Republic.

He holds a Ph.D. from the Charles University of Prague in 1968 and completed his thesis on the topic ‘Magnetic Properties of Uranium Compounds at Cryogenic Temperatures'.

Career

After graduating and two years as Assistant Professor at the Faculty of Mathematics and Physics, Charles University Prague, he joined for four years Texas Instruments, Dallas, USA, working on semiconductor technology.

For the following six years, he worked at CERN, the Particle Physics Research Centre in Geneva, in the development of superconducting magnets for accelerators.[60]

For the next twenty-five years, he was the Director of the Functional Genomics Technology Department at the European Molecular Biology Laboratory (EMBL) in Heidelberg,[26] with development groups and core facilities in Biochemical Technology, DNA Chemistry (head Brian Sproat), Protein and Peptides, Mass Spectrometry (head Matthias Mann), Cell Imaging, Injection, Sorting and Analysis.

Ansorge developed (1985, 1986) the automated fluorescence DNA sequencer[29][30] and novel methods[17] to sequence the first larger human DNA fragment, the HPRT gene locus.[17] The methods[17][54][55][56], Doublex both strands sequencing for high accuracy, the pair-end strategy for precise genome mapping, and techniques for DNA samples preparation [17][27] were used later for generating the first sequence of the human genome,[28][27][31] and selected for the first planned private genome project.[21] His team participated further in international collaborations on sequencing genomes of yeast, Arabidopsis, mouse, and mosquito organisms,[47][52][61] in clinical studies [44][61] and cDNA sequencing consortia[16] (WO2001012659A2 patent for Human cDNA granted).

With the need for high throughput methods, he developed in 1991 the principle of a next-generation DNA Sequencing technique without gels,[19] on solid supports with convertible fluorescent terminators as in modern sequencers, and the principle of the DNA chip technique.[19] After the publication of the human genome sequence, his team produced the first complete Human Genome Array,[7][34] **[42]** allowing parallel analyses of multiple human gene expression profiles and complex biological and clinical studies, e.g., on stem cells, cancer genetics, and human evolution.[44][45][61][62]

Using the “Single-Cell as a Laboratory,” he designed Automated Microinjection and Image Analysis of Single Cells,[15][43][57] and Electro-transfection technique,[38] facilitating large-scale studies of DNA, RNA, and proteins directly in cells[42][43][58][59][61] Ansorge established novel methods for sorting of cells and organelles[46] and techniques for the separation of DNA and proteins in biomedical analysis.[30][58][59][61]

He collaborates with the Cancer Research Center (DKFZ) and the University of Heidelberg, and recently EPFL-ETH Lausanne. Since 1993, he has been visiting professor at Charles University in Prague[13] and is a foreign member of the Assembly of the Czech Academy of Sciences.[14] He served on Scientific Advisory Boards[50] (e.g., Genoscope Paris, Sanger Centre Cambridge, EPFL-ETH Lausanne projects, BIOCEV Prague, MedLSI Split), evaluating grants, projects, and institutions.

Publications and Patents

Ansorge has co-authored over 400 publications,[25][61] conferences,[48][51] presentations (Mendel Lecture), scholar papers for universities,[25] reports,[3] books,[4] organized over 60 EMBO, EMBL and FEBS advanced and Ph.D. courses in Europe, Asia, and America.[26] He applied and was granted over 30 patents in genomics and technology,[11] with license agreements and commercial devices used in laboratories worldwide.[30][43][57]

Some of his publications, books, and projects are listed below:

- High Throughput DNA Sequencing and DNA chip techniques, Patent application (1991)[19]
- The Human Genome On a Chip, EMBL Press Release, 2002 [7][45], in the book [34][42]
- Automated Microinjection, Image Processing, Single Cells (1982-1998)[15][43] USpat[57]
- A non-radioactive automated DNA sequence determination Semantic Scholar (1986) [29]
- Automated DNA sequencing: ultrasensitive detection of fluorescent bands during electrophoresis | Nucleic Acids Research | Oxford Academic (oup.com) (1987)[30]
- Next Generation DNA Sequencing Techniques (I) (2009, 2010) Scholar paper,[18]
- Next Generation DNA Sequencing Techniques (II) (2016, 2017),[29][32],
- DOUBLEX sequencing on both DNA strands, (1995,1996),[54][55][17], US Patent[56]
- Internal Labelling DNA Sequencing without labeled primers, (1995, 1996),[52], US pat.[53]
- DNA Sequencing with one label in one reaction, in capillary (1989),[39][40], US pat.[41]
- SAGE (Serial Analysis of Gene Expression technique in Yeast, 1999)[49]
- MIAME Array Standardisation, Science 2000,[8][42] scholar paper
- DNA Sequencing Strategies: Automated and Advanced Approaches (1996)[5]
- Molecular Diagnostics (2006)[6]
- Molecular Diagnostics 2nd Updated (2011)[9]
- Molecular Diagnostics 3rd Updated (2016)[10]
- The Prototype Superconducting Magnet for the CERN Rings[60]

Awards and memberships

- Elected EMBO member (1999)[12]
- Elected foreign member, Assembly of the Czech Academy of Sciences (2009)[14]
- Granted the first European Chair, sponsored by European Union (1993)[24]
- Member of International Image Consortium for cDNA[16]
- Golden Medal for Science from the Charles University, Prague, for development of the automated fluorescent DNA sequencing enabling advances in molecular genetics (1993)[23]
- Awarded the European Biotechnology grant price for Large DNA Sequencing Facility [47]
- Honorary Doctorate, Charles University, Prague, for development of techniques advancing genome research and molecular medicine (1992)[23]
- Awarded over 50 EU, EMBO, and FEBS science grants as principal investigator[47]
- Nominated Visiting Professor, 1st Medical Faculty, Charles University, Prague, (1993)[13]
- Served on editorial boards of several peer-reviewed science journals[22]

Personal life

Ansorge is married to Alexandra and has three children.

References

1. Wilhelm Ansorge
2. Prof. Dr. Wilhelm J. Ansorge, Ph.D.
3. Wilhelm Ansorge
4. Books : Wilhelm Ansorge
5. DNA Sequencing Strategies: Automated And Advanced Approaches
6. Molecular Diagnostics First Edition
7. The HUMAN GENOME ON A CHIP, EMBL Press Release, 2002
8. MIAME Standardisation, 2000, Scholar paper
9. Molecular Diagnostics Second Edition
10. Molecular Diagnostics Third Edition
11. Patents by Inventor Wilhelm Ansorge
12. EMBO member list

13. Honorary professor
14. Members of Czech Academy of Science
15. Automated system for capillary microinjection into living cells
16. Image Consortium WO2001012659A2 Human cdna sequences
17. Automated DNA Sequencing Of HPRT Gene Locus
18. Next-generation DNA sequencing techniques
19. New nucleic acid sequencing method - using one labelled nucleotide at one time in cycles comprising elongation, wash, label detection and removal of the label, then repeating
20. Upgrading German genomics
21. American Association for the Advancement of Scienc
22. BioTechniques® Editorial Board
23. Honorary Doctorates
24. NOMINATION of Prof. Wilhelm Ansorge for the FIRST EUROPEAN CHAIR, 1993, selected by International Committee chaired by Lord Dahrendorf, Oxford, managed by the Institute For Human Sciences, Vienna
25. Wilhelm Ansorge - Semantic Scholar
26. EMBL Annual Report
27. Initial sequencing and analysis of the human genome
28. C. Thomas Caskey (1938–2022)
29. A non-radioactive automated method for DNA sequence determination.
30. Automated DNA sequencing: ultrasensitive detection of fluorescent bands during electrophoresis Get access Arrow
31. INITIAL FEASIBILITY TO SEQUENCE HUMAN GENOME, J. Watson, W. Ansorge, Telegraph Magazine, 17. August, 1991, p.33
32. Chapter 8 - Perspectives for Future DNA Sequencing Techniques and Applications
33. Instruments of Science: An Historical Encyclopedia
34. Humankind 2.0 Human Genome on a Chip
35. The Gene Wars: Science, Politics and the Human Genome - Interview Wilhelm Ansorge, pp. 71, 362
36. Lion Bioscience Reports Dynamic First-Year Operations
37. Lion Bioscience Seeks $191M In IPO On Nasdaq, Neuer Markt
38. Electroporation of Cells
39. One label, one tube, Sanger DNA sequencing in one and two lanes on a gel.
40. Automated sanger DNA sequencing with one label in less than four lanes on gel
41. Process for sequencing nucleic acids
42. Microarray and Single Cell Analysis Techniques in Bio-medical Fields
43. Computer-Automated Capillary Microinjection of Macromolecules into Living Cells
44. Genetic Analysis in Translational Medicine: The 2010 GOLDEN HELIX Symposium.
45. Comparative characteristics of mesenchymal stem cells from human bone marrow, adipose tissue, and umbilical cord blood
46. Immuno-isolation using magnetic solid supports to reconstitute vesicle transport in cell free system
47. The common thread : a story of science, politics, ethics, and the human genome : Sulston, John : Free Download, Borrow, and Streaming : Internet Archive 47. Wilhelm Ansorge, pp 86, 87
48. Wilhelm Ansorge on DNA Sequencing, Cancer and future insights
49. Dynamics of Gene Expression Revealed by Comparison of Serial Analysis of Gene Expression Transcript Profiles from Yeast Grown on Two Different Carbon Sources
50. Scientific Advisory Board
51. Bringing laboratory technology into the age of automation
52. DNA Sequencing and Analysis of 130 kb from Yeast Chromosome XV
53. Method for sequencing nucleic acids
54. Simultaneous On-line DNA Sequencing on Both Strands with Two Fluorescent Dyes
55. “Doublex” Fluorescent DNA Sequencing: Two Independent Sequences Obtained Simultaneously in One Reaction with Internal Labeling and Unlabeled Primers
56. Simultaneous sequencing of nucleic acids
57. Apparatus Automated Microinjection, Patent application

58. Transcriptomics and proteomics. Applications to ecotoxicology
59. High throughput production of mouse monoclonal antibodies using antigen microarrays
60. The Prototype Superconducting Quadrupole Magnet for the CERN Intersecting Storage Rings
61. Wilhelm Ansorge Publications
62. A Neutral Model Of Transcriptome Evolution

ALTERNATIVE LINK TO REFERENCE 7 (Human Genome on a Chip) :

reference 7 (Human Genome on Chip), the following links :

The Human Genome on a Chip - 15 Dec 2002 [HTML page]
https://web.archive.org/web/20030301013621/http://www.embl-heidelberg.de/ExternalInfo/oipa/pr2002/pr151202.html

The Human Genome on a Chip - 15 Dec 2002 [PDF version]
https://web.archive.org/web/20030315043800/http://www.embl-heidelberg.de/ExternalInfo/oipa/pr2002/pr151202.pdf