

**Gherman
Wiederschain, MD,
Ph.D., Doctor of
Biological Science**

Biosketch

Dr. Gherman Wiederschain graduated from the Crimea Medical School in the former Soviet Union in 1962 (MD with Honor). He got his Ph.D. in 1967 and Doctor of Science Degree (Biology/Biochemistry) in 1979 at the Institute of Biomedical Chemistry (IBC), Academy of Medical Science of USSR (Moscow). Gherman subsequently held the following positions at IBC: Scientist, Senior Scientist, and finally Professor and Chief of Laboratory of Biochemical Basis of Inherited Disease until his move to the United States in 1993.

The research in Dr. Wiederschain laboratory in Moscow primarily focused on glycobiology, particularly on carbohydrate biochemistry and enzymology, including biochemistry of lysosomal storage diseases (LSD). Gherman's lab pioneered the discovery of multiple forms of α -L-fucosidases. He and his colleagues also showed that glycosidase deficiencies in LSD are accompanied by dramatic changes in cellular cytoskeleton, including the reorganization of vimentin-type intermediate filaments and increase in intralysosomal pH. Gherman and his colleagues also established specificity of certain human lysosomal glycolipid hydrolases using a novel series of 4-MUF-glycosides, synthesized in the first time in the Gherman's lab, with fatty acid chains of various lengths.

In addition to his research, Gherman has had broad teaching experience in Russia. He has led numerous seminars and gave many lectures on the glycobiology and biochemistry of hereditary diseases. For ten years (1980 - 1990), Gherman was lecturer and Course Director at the Biochemistry Department of Moscow State University. During this time Gherman presented a series lectures on the metabolism and biological role of glycoconjugates and their abnormal storage due hereditary deficiency of certain hydrolytic enzymes at LSD.

In 1989 -1990 Dr. Wiederschain received a fellowship from the Fogarty Foundation of the US National Institutes of Health to become a Visiting Scientist/Professor at the E. K. Shriver Center for Mental Retardation in Waltham, MA, where he developed a new biochemical method for diagnosing Krabbe's disease (deficiency of lysosomal galactocerebrosidase) in humans and in naturally occurring animal models ("twitcher mice").

In 1992, Dr. Wiederschain was invited to the Metropolitan Institute of Life Science (Tokyo, Japan) where he presented a series of lectures on substrate specificity of lysosomal glycosidases in the normal state and in LSD.

Following his move to the United States in 1993, Dr. Wiederschain joined the E. K. Shriver Center for Mental Retardation and was also appointed as a Scientist at Harvard Medical School. During his tenure at the E.K. Shriver Center, Gherman was involved in the study of glycosylation steps (fucosylation) in the biosynthesis of stage specific embryonic antigen SSEA-1 (Le^x), an epitope that

plays a key role in cell-cell interactions during brain development. In addition, Gherman investigated the activity of several glycosidases in the human milk over the course of lactation and showed that these enzymes might be important for the overall concentration of milk oligosaccharides as protective factors against pathogens in human milk.

In 1998 – 2000 Gherman worked as a Senior Scientist at ZymeQuest, Inc., Beverly, MA. He developed enzymatic approaches for transformation of Blood Group Antigens specificity by action of certain microbial glycosidases. Gherman was involved also in developing Company scientific strategies and performed general laboratory management.

Starting in 2000, Dr. Wiederschain has been working as a Scientist at Transkaryotic Therapies, Inc. /Shire, Human Genetic Therapies (Shire, HGT). Gherman has been involved in a number of company projects and contributed to the development of enzyme replacement therapy for Fabry Disease, MPS-projects (Hunter disease), Krabbe disease and others. Gherman also developed several biochemical and analytical methods for the identification and quantitation of metabolites as specific markers of these diseases. Dr. Wiederschain submitted several patent applications related to Shire' research projects.

In July 2011 Dr. Wiederschain retired from Shire HGT and was invited participate grants dependant Glycobiology Program at Biology Department of Boston College (MA, USA) as Research Associate Professor in Dr. D. S. Newburg' laboratory. During Dr. Wiederschain tenure in Biology Department of Boston College he was involved in writing and editing scientific papers including reviews, supervision of undergraduate and graduated BC students and postdocs, he did various presentations on the conferences, symposiums, and internal laboratory meetings. Gherman was member of Board of Directors of Boston Glycobiology Discussion Group (BGDG) at Boston College.

After ending grants support for Glycobiology Program in 2014, Gherman was appointed for one year as a Scholar at Biology Department of Boston College and finished his appointment in the end of 2015. In May 2017 Dr. Wiederschain was again appointed for one year as a Scholar at Biology Department of Boston College and currently he is staying in Professor Thomas Seyfried Lab, where Gherman involved in participation of Lab meeting, discussions of Lab projects, and tutoring process in glycobiology.

Dr. Wiederschain is the author, co-author and editor of books "Biochemical Bases of Glycosidases" (in Russian, Moscow, Meditsina, 1980, 288 pp.) and "Glycobiology and Human Diseases" (CRC Press, Taylor & Francis Group, 2016, 324 pp.) Gherman was inviting author and co-author of chapters of following books: 1. Encyclopedia of Physical Organic Chemistry, 6 Volumes Set, by [Zerong Wang](#) (Editor), [Uta Wille](#) and [Eusebio Juaristi](#) (Associate Editors), ISBN: 978-1-118-47045-9, 4464 pages, John Wiley & Sons, 2017. G. Wiederschain, Vol. 6, Chapter 72, Glycobiology, p. 3949-3992. 2. Dietary Sugars: Chemistry, Analysis, Function and Effects, Victor R Preedy (Editor), Chapter 32: Analysis of Human Milk Lactose, David S Newburg, Ceng Chen and Gherman Wiederschain, 2012.

Dr. Wiederschain is author and co-author more than 150 publications in peer review scientific journals. Dr. Wiederschain is an International Advising Board Member for Biomedical Chemistry Journal (Moscow, Russian Federation), he is member of Editorial Board of Journal of Pediatric Diseases (from 2017). Gherman is also served as a new book reviewer for International journal "Biochemistry (Moscow)" published monthly simultaneously in Russian and English. For more than three decades this journal has published more than 100 reviews for new books from various Publisher Houses such as Springer, CRC Press, Marcel & Dekker, Humana Press and others.

In 2013 Dr. Wiederschain was key person and Guest Editor for special Glycobiology issue of "Biochemistry (Moscow)" journal, # 7, July, 2013. This issue, including Dr. Wiederschain review "Glycobiology: Progress, Problems, and Perspectives" with other papers of the international contributors available on the Springer web site link:

<http://link.springer.com.proxy.bc.edu/journal/volumesAndIssues/10541> or in the "Biochemistry" website: <http://protein.bio.msu.ru/biokhimiya/>