

Bertil R.R. Persson

A Story about Schizophrenia Imaging and Metabolism



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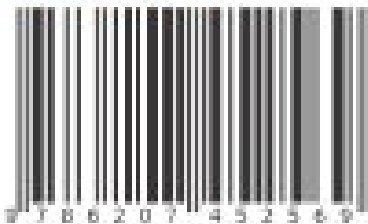
The author was already in the 1970s involved in Nuclear medicine imaging in Lund where David Ingvar and Göran Franzén studied the brain's regional blood flow in Schizophrenia patients. The introduction of magnetic resonance imaging MRI in the 1980th offered new methods for imaging CSF flow dynamics in the aqueduct. Functional fMRI may be another useful tool for defining the syndrome of Schizophrenia. Diffusion tensor imaging DTI and its combination with magnetic transfer imaging MTI indicate neuroinflammation in Schizophrenia. MR spectroscopy provides reliable quantification of more than fifteen different brain metabolites such as N-Acetyl Aspartic acid (NAA), Creatine, GABA, Glutamate, and Glutamine in various brain regions. Activation of the Tryptophan metabolism (TRYCAT) pathway appears to be invoked in the development and pathophysiology of Schizophrenia. The dysfunction of the effect of the α -7-nicotinic-acetylcholine receptor (α 7nAChR) and/or the N-methyl-D-Aspartate receptor (NMDAR), seems to contribute to cognitive impairment in Schizophrenia motivating new therapeutic strategies. The final chapter reviews serum biomarkers.

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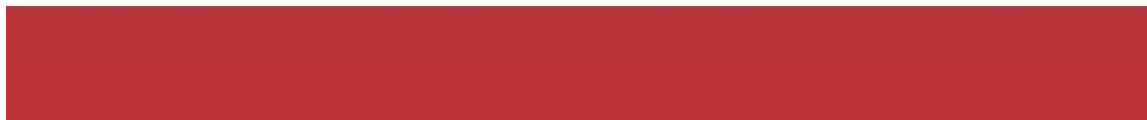


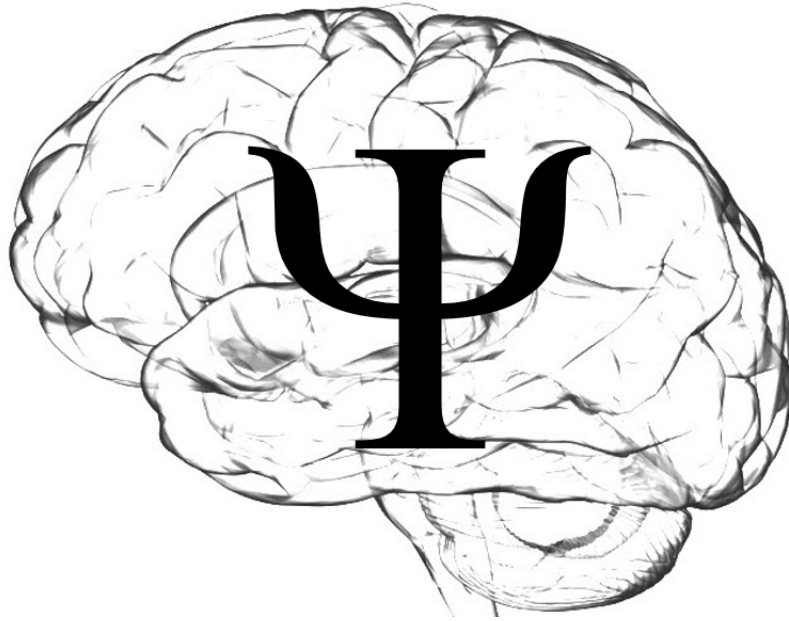
Bertil Å.R. Persson, born in Oct. 12, 1938 in Malmö, Sweden, Dr. of Philosophy and Medical Dr. Honoris causa, Full Professor in Medical Radiation Physics at the University of Lund (1980-2005). Since 1981 engaged in nuclear magnetic resonance imaging MRI, 2015 a 7-tesla imaging MR came to Lund, which opened his interest in Schizophrenia imaging.

FOR AUTHORITY



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A STORY ABOUT SCHIZOPHRENIA IMAGING AND METABOLISM

**By Bertil R.R. Persson
Lund 2023**

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My Story about the book:

A STORY ABOUT SCHIZOPHRENIA IMAGING AND METABOLISM

**By Bertil R.R. Persson
Lund 2023**

Mina egna erfarenheter av medicinsk bilddiagnostik började redan 1963 då jag rekryterades som kemist till avdelningen för medicinsk radiofysik. Nordens första gammakamera hade anlänt till avdelningen. Dock hade man inte tillgång till lämpliga radiofarmaka.

Genom det nyligen utvecklade $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ generatorsystemet producerades Teknetium-99m som med sina egenskaper som ren gamma-emitter var den idealiska radionukliden för klinisk användning med gamma kamera. Generatorsystemet levererade Teknetium-99m som perteknetat $^{99\text{m}}\text{TcO}^{4-}$ som kunde ersätta Jod-131 för sköldkörtelundersökningar. För andra organ måste man försöka tillverka andra kemiska former av Teknetium-99m.

I den då rådande läkemedelsförordningen fanns ett undantag som tillät klinisk användning av radioaktiva läkemedel utan omfattande klinisk prövning. Min uppgift blev att tillverkade en $^{99\text{m}}\text{Tc}$ -svavelkolloid för gammakamera undersökning av levern. Detta preparat användes i kliniken under 15 år då den nya läkemedelsförordningen ändrades till att kräva kommersiellt tillverkade radiofarmaka.

Mitt intresse för hjärnans kemi väcktes med mitt engagemang att införa magnet resonans avbildning (MRI) och efter att det 2015 installerats en 7 tesla MR i Lund påbörjade jag arbetet med boken.

Denna bok är min berättelse om hur jag har försökt analysera möjligheterna att utnyttja de senaste decenniernas enorma utveckling inom klinisk bilddiagnostik och kemi till fromma för patienter som diagnostiseras med Schizofreni.

Den är också ett tack till alla underbara personer som jag fått förmånen att samverka med under alla år.

Kanske kan boken vara till inspiration för någon ung medicinare att verka för mera bild-diagnostik inom psykiatrin.

Lund December 28 2023, Bertil RR Persson

My Story about the book:

A STORY ABOUT SCHIZOPHRENIA IMAGING AND METABOLISM

By Bertil R.R. Person

Lund 2023

My own experiences with medical imaging began as early as 1963 when I was recruited as a chemist to the Department of Medical Radiation Physics. The Nordics' first gamma camera had arrived at the department. However, they did not have access to suitable radiopharmaceuticals.

Through the newly developed $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ generator system, Technetium-99m was produced which, with its properties as a pure gamma emitter, was the ideal radionuclide for clinical use with a gamma camera. The generator system delivered Technetium-99m as Pertechnetate $^{99\text{m}}\text{TcO}_4^-$ which could replace Iodine-131 for thyroid examinations. For other organs, one must try to make other chemical forms of Technetium-99m.

In the then-current Pharmaceutical regulations, there was an exception that allowed the clinical use of radioactive medicines without extensive clinical testing. My task was to produce a $^{99\text{m}}\text{Tc}$ -Sulfur colloid for the gamma camera examination of the liver. This preparation was used in the clinic for 15 years when the new Pharmaceutical regulation was changed to require commercially manufactured radiopharmaceuticals for clinical use.

My interest in the chemistry of the brain was awakened with my commitment to introduce magnetic resonance imaging (MRI) and I started to work on this book after the 7 tesla MRI was installed in Lund in 2015.

This book is my story of how I have tried to summarize the possibilities of using the last decades' enormous advances in clinical imaging and chemistry for the benefit of patients diagnosed with Schizophrenia.

It is also dedicated to all the wonderful people I have had the privilege of working with over the years.

Perhaps the book can be an inspiration for some young medical doctor to work for more image diagnostics in psychiatry.

Lund December 28, 2023, Bertil RR Persson