

The Doctoral Program [ION CHANNELS AND TRANSPORTERS AS MOLECULAR DRUG TARGETS](#) („MolTag“) and the [Pharma & Food Lecture Series](#) (580006 SE) are pleased to invite you to the following lecture

"Identification of the long-sought GHB high-affinity binding site in the mammalian brain"

by Prof. Petrine WELLENDORPH, PhD

[Department of Drug Design and Pharmacology](#), University of Copenhagen/DK

on: **Thursday, March 17, 2022, 05:15pm (17:15)**

at: **UZA 2, Althanstr. 14, 1090 Vienna, Lecture Hall 5 (HS 5)**



ABSTRACT: γ -Hydroxybutyric acid (GHB) is a metabolite of γ -aminobutyric acid (GABA), the main inhibitory neurotransmitter in the central nervous system (CNS). Besides being a natural substance, GHB possesses many pharmacological roles. It is used clinically for the treatment of narcolepsy (Xyrem[®]) and alcoholism (Alcover[®]), and as a recreational drug of abuse (a.k.a. *Fantasy*). In the brain, GHB binds with high affinity to an expressionally abundant class of proteins in the forebrain. These binding sites and their function have remained elusive since 1982. Using an unbiased chemical proteomics approach, we have recently identified the long-sought-after binding protein for GHB to be the Ca^{2+} /calmodulin-responsive kinase II alpha (CaMKII α) (Leurs *et al.*, *PNAS* 118(31):e2108079118, 2021). CaMKII α is one of the most abundant proteins in the brain with crucial functions in neuronal signalling and an important role in synaptic plasticity and learning. Furthermore CaMKII α is pathophysiologically involved in cerebral ischemia, yet no CaMKII α drugs are on the market. **In this lecture, I will present the target identification and validation of CaMKII α with a range of structural, molecular and cellular evidence. I will further present that GHB analogues are neuroprotective *in vitro* and in mouse models of stroke, and try to correlate**

RESEARCH PROFILE: Petrine Wellendorph is professor of molecular neuropharmacology at the Dept. of Drug Design and Pharmacology, Univ. Copenhagen. The main research focus is on GHB and GABA receptors and transporters in the field of molecular pharmacology and aims to promote drug discovery in relation to brain disorders. **The research of Dr. Wellendorph in the GHB/GABA field is at the international forefront as signified by her [publication list](#).** Her lab, which was founded in 2012, includes facilities for state-of-the-art molecular biology, cell culturing, pharmacological assaying, electrophysiology, radioligand binding/autoradiography, and in vitro and in vivo pharmacology on genetically modified mice. Dr. Wellendorph has founded the university spin-out [Ceremedy](#) focusing on drug discovery within CNS disorders. Dr. Wellendorph is highly active in the neuroscience community in Denmark and in the scientific community in general. From 2010-2015 she was a member of the board of the Danish Society for Neuroscience.