

Robert Luedtke, PhD  
Graduate School of Biomedical Sciences  
Institute for Healthy Aging  
Pharmacology & Neuroscience  
Email: Robert.Luedtke@unthsc.edu



## Area of Expertise

My laboratory is interested in developing and characterizing safe and effective drugs that can be used for the treatment of individuals afflicted with Parkinson's disease, Alzheimer's disease, schizophrenia, Tourette syndrome, and dystonia. We have also worked to develop drugs that can be used to assist in the rehabilitation of individuals who abuse cocaine. These studies have provided insights on the role of dopamine and sigma receptors in the brain.

## Qualifications

BA in Chemistry, University of Illinois at Urbana-Champaign  
BS in Microbiology, University of Illinois at Urbana-Champaign  
PhD in Immunology, University of Pennsylvania

## Recent Publications

### **Interaction of ligands for pet with the dopamine d3 receptor: In silico and in vitro methods**

Hsieh, C. J., Riad, A., Lee, J. Y., Sahlholm, K., Xu, K., Luedtke, R. R. & Mach, R. H., Apr 2021, In: Biomolecules. 11, 4, 529.

### **Ligand with two modes of interaction with the dopamine D2 receptor-an induced-fit mechanism of insurmountable antagonism**

Sahlholm, K., Agren, R., Zeberg, H., Stepniewski, T. M. I., Benjamin Free, R., Reilly, S. W., Luedtke, R. R., Arhem, P., Ciruela, F., Sibley, D. R., Mach, R. H., Selent, J. & Nilsson, J., 7 Oct 2020, In: ACS Chemical Neuroscience. 11, 19, p. 3130-3143 14 p.

### **Design, synthesis, and evaluation of N-(4-(4-phenyl piperazin-1-yl)butyl)-4-(thiophen-3-yl)benzamides as selective dopamine D<sub>3</sub> receptor ligands**

Chen, P. J., Taylor, M., Griffin, S. A., Amani, A., Hayatshahi, H., Korzekwa, K., Ye, M., Mach, R. H., Liu, J., Luedtke, R. R., Gordon, J. C. & Blass, B. E., 15 Sep 2019, In: Bioorganic and Medicinal Chemistry Letters. 29, 18, p. 2690-2694 5 p.

### **Leveraging a Low-Affinity Diazaspiro Orthosteric Fragment to Reduce Dopamine D<sub>3</sub> Receptor (D<sub>3</sub>R) Ligand Promiscuity across Highly Conserved Aminergic G-Protein-Coupled Receptors (GPCRs)**

Reilly, S. W., Riad, A. A., Hsieh, C. J., Sahlholm, K., Jacome, D. A., Griffin, S., Taylor, M., Weng, C. C., Xu, K., Kirschner, N., Luedtke, R. R., Parry, C., Malhotra, S., Karanicolas, J. & Mach, R. H., 23 May 2019, In: Journal of Medicinal Chemistry. 62, 10, p. 5132-5147 16 p.

### **Analogues of Arylamide Phenylpiperazine Ligands to Investigate the Factors Influencing D3 Dopamine Receptor Bitropic Binding and Receptor Subtype Selectivity**

Hayatshahi, H. S., Xu, K., Griffin, S. A., Taylor, M., Mach, R. H., Liu, J. & Luedtke, R. R., 19 Dec 2018, In: ACS Chemical Neuroscience. 9, 12, p. 2972-2983 12 p.

### **Dopamine D3 receptor partial agonist LS-3-134 attenuates cocaine-motivated behaviors**

Powell, G. L., Bonadonna, J. P., Vannan, A., Xu, K., Mach, R. H., Luedtke, R. R. & Neisewander, J. L., Dec 2018, In: Pharmacology Biochemistry and Behavior. 175, p. 123-129 7 p.

### **Dopamine D3 receptor partial agonist LS-3-134 attenuates cocaine-motivated behaviors**

Powell, G. L., Bonadonna, J. P., Vannan, A., Xu, K., Mach, R. H., Luedtke, R. R. & Neisewander, J. L., Aug 2018, In: Pharmacology Biochemistry and Behavior. 171, p. 46-53 8 p.

### **Challenges in the development of dopamine D2- and D3-selective radiotracers for PET imaging studies**

Mach, R. H. & Luedtke, R. T., 1 Mar 2018, In: Journal of Labelled Compounds and Radiopharmaceuticals. 61, 3, p. 291-298 8 p.

### **Dissociation of striatal dopamine and tyrosine hydroxylase expression from aging-related motor decline: Evidence from calorie restriction intervention**

Salvatore, M. F., Terrebonne, J., Cantu, M. A., McInnis, T. R., Venable, K., Kelley, P., Kasanga, E. A., Latimer, B., Owens, C. L., Pruett, B. S., Yu, Y., Luedtke, R., Forster, M. J., Sumien, N. & Ingram, D. K., 1 Jan 2018, In: Journals of Gerontology - Series A Biological Sciences and Medical Sciences. 73, 1, p. 11-20 10 p.

### **Highly Selective Dopamine D<sub>3</sub> Receptor Antagonists with Arylated Diazaspiro Alkane Cores**

Reilly, S. W., Griffin, S., Taylor, M., Sahlholm, K., Weng, C. C., Xu, K., Jacome, D. A., Luedtke, R. R. & Mach, R. H., 14 Dec 2017, In: Journal of Medicinal Chemistry. 60, 23, p. 9905-9910 6 p.

## **Sponsored Projects**

### **D3 Receptor Compounds for the Treatment of Psychostimulant Abuse**

Luedtke, R.

NIDA: National Institute on Drug Abuse

15/02/15 → 30/11/18

### **D3 Receptor Compounds for the Treatment of Psychostimulant Abuse**

Luedtke, R. & LUEDTKE, R. R.

National Institute on Drug Abuse

30/09/07 → 30/11/19

### **D3 Receptor Compounds for the Treatments of Psychostimulant Abuse - Equipment Supplement**

Luedtke, R.

NIDA: National Institute on Drug Abuse

1/09/09 → 31/08/10

### **Development of Dopamine D3 Ligands as Medications for Psychostimulant Addiction**

Luedtke, R.

Southern Research Institute

30/09/09 → 31/08/12

### **Discovery of functionally selective Alzheimer's disease therapeutics**

Luedtke, R. & Schetz, J.

National Institute on Aging

15/09/17 → 31/05/21

### **Discovery of Functionally Selective Alzheimer's Disease Therapeutics**

Luedtke, R.

NIA: National Institute on Aging

15/09/17 → 31/05/22

### **Mapping the D2/D3 Dopamine Receptor Binding Sites**

Luedtke, R. & LUEDTKE, R. R.

National Institute on Drug Abuse

20/07/01 → 31/05/06

### **Neuroprotective Effect of Sigma 1 Receptor Selective Ligand (For:Maninder Malik)**

Luedtke, R.

Sigma Xi

1/07/13 → 30/06/15

**PET Radiotracer for Imaging the Dopamine D3 Receptor**

Luedtke, R.  
University of Pennsylvania  
1/05/16 → 29/02/20

**PET Radiotracers for Imaging the Dopamine D3 Receptor**

Luedtke, R.  
Washington University  
1/07/10 → 30/06/14

**PET Radiotracers for Imaging the Dopamine D3 Receptor**

Luedtke, R.  
University of Pennsylvania  
1/07/13 → 30/06/14

**PHARMACOTHERAPY OF COCAINE ABUSE**

Luedtke, R.  
National Institute on Drug Abuse  
30/09/94 → 31/08/99

**REGULATION OF DOPAMINE RECEPTOR SUBTYPES**

Luedtke, R.  
National Institute of Neurological Disorders and Stroke  
1/01/93 → 31/12/97

**Sigma 1 Receptor as a Target for Repetitive Concussive Brain Injury**

Schreihofner, D., Luedtke, R. & Sumien, N.  
Intramural Research(UNTHSC)  
1/08/16 → 30/04/18

**THERAPEUTICS FOR COCAINE DEPENDENCE--NATURAL PRODUCTS**

Luedtke, R.  
National Institute on Drug Abuse  
20/01/99 → 30/11/01

**UNTHSC Summer Research Internship Program (SRIP)**

Jones, H., Luedtke, R. & Vishwanatha, J.  
NIDA: National Institute on Drug Abuse  
15/04/18 → 28/02/23