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## Area of Expertise

My lab mainly studies the details of synaptic function mediated by GABA type A and glycine ion channels and receptors and its modulation and plasticity under physiological and pathological states, using a variety of modern electrophysiological and molecular biological techniques such as patch-clamp, site-directed mutagenesis, substituted cysteine accessibility method (SCAM), immunofluorescence microscopy, pharmacological, and conventional biochemical techniques.

Projects within the lab are to study these synapses from cellular to molecular levels utilizing various preparations including brain slice and recombinant preparations. Overall, our major objective is to provide a molecular description of the therapeutically important receptors/channels; to gain a deeper understanding of their role in normal and diseased states; and eventually to develop novel therapeutic interventions which target these receptors.

## Qualifications

PhD in Physiology, Shanghai Institute of Physiology

## Recent Publications

### Identification of a unique Ca<sup>2+</sup>-binding site in rat acid-sensing ion channel 3

Zuo, Z., Smith, R. N., Chen, Z., Agharkar, A. S., Snell, H. D., Huang, R-Q., Liu, J. & Gonzales, E. B., 1 Dec 2018, In : Nature Communications. 9, 1, 2082.

### "Ecstasy" to addiction: Mechanisms and reinforcing effects of three synthetic cathinone analogs of MDMA

Dolan, S. B., Chen, Z., Huang, R-Q. & Gatch, M. B., 1 May 2018, In : Neuropharmacology. 133, p. 171-180 10 p.

### The dual modulatory effects of efavirenz on GABA<sub>A</sub> receptors are mediated via two distinct sites

Huang, R-Q., Chen, Z., Dolan, S., Schetz, J. & Dillon, G. H., 15 Jul 2017, In : Neuropharmacology. 121, p. 167-178 12 p.

### Methylene blue inhibits GABA<sub>A</sub> receptors by interaction with GABA binding site

Chen, Z., Liu, R., Yang, S., Dillon, G. H. & Huang, R-Q., 1 Jun 2017, In : Neuropharmacology. 119, p. 100-110 11 p.

### Molecular mechanisms of serotonergic action of the HIV-1 antiretroviral efavirenz

Dalwadi, D. A., Kim, S., Amdani, S. M., Chen, Z., Huang, R-Q. & Schetz, J., 1 Aug 2016, In : Pharmacological Research. 110, p. 10-24 15 p.

### Pgrmc1/BDNF signaling plays a critical role in mediating glia-neuron cross talk

Sun, F., Nguyen, T., Jin, X., Huang, R-Q., Chen, Z., Cunningham, R. L., Singh, M. & Su, C., 1 May 2016, In : Endocrinology. 157, 5, p. 2067-2079 13 p.

### The effects of sigma ( $\sigma$ 1) receptor-selective ligands on muscarinic receptor antagonist-induced cognitive deficits in mice

Malik, M., Rangel-Barajas, C., Sumien, N., Su, C., Singh, M., Chen, Z., Huang, R-Q., Meunier, J., Maurice, T., Mach, R. H. & Luedtke, R. T., 1 May 2015, In : British Journal of Pharmacology. 172, 10, p. 2519-2531 13 p.

### PTEN degradation after ischemic stroke: A double-edged sword

Li, W., Huang, R-Q., Chen, Z., Yan, L-J., Simpkins, J. W. & Yang, S., 22 Aug 2014, In : Neuroscience. 274, p. 153-161 9 p.

### Extracellular pH modulates GABAergic neurotransmission in rat hypothalamus

Chen, Z. L. & Huang, R-Q., 20 Jun 2014, In : Neuroscience. 271, p. 64-76 13 p.

### **The HIV antiretroviral drug efavirenz has LSD-like properties**

Gatch, M. B., Kozlenkov, A., Huang, R-Q., Yang, W., Nguyen, J. D., González-Maeso, J., Rice, K. C., France, C. P., Dillon, G. H., Forster, M. J. & Schetz, J., 1 Nov 2013, In : Neuropsychopharmacology. 38, 12, p. 2373-2384 12 p.

## **Sponsored Projects**

### **Dietary Targeting of Dihydropyrimidine Dehydrogenase for Stroke Tolerance**

Forster, M., Huang, R. & Sumien, N.

NINDS: Neurological Disorders & Stroke

1/04/13 → 31/03/18

### **Mechanisms of Cognitive Decline During Aging - Core C**

Huang, R.

NIA: National Institute on Aging

1/03/13 → 28/02/15

### **Metformin and Cognition**

Liu, R., Huang, R., Yang, S. & Sumien, N.

Intramural Research(UNTHSC)

1/05/16 → 31/08/17

### **Methylene Blue for Ischemic Stroke Therapy**

Liu, R., Huang, R. & Yang, S.

American Heart Association

12/06/13 → 30/06/17

### **Modulation of GABA-A Receptor Function as a Potential Therapeutic Intervention for Cognitive Impairment after Stroke**

Huang, R. & Yang, S.

Intramural Research(UNTHSC)

15/01/12 → 14/01/13

### **Modulation of GABAergic Neurotransmission by Oxidation Stress**

Huang, R.

Intramural Research(UNTHSC)

15/10/14 → 14/10/15

### **Neuroprotection of Nonfeminizing Estrogens Against Cognitive Deficits of Alzheimer's Disease**

Huang, R. & Sumien, N.

Texas A&M Health Science Center

1/10/15 → 30/09/17

### **Susceptibility of Cerebellar Purkinje Cells to Oxidative Stress**

Huang, R. & Yang, S.

William & Ella Owens Med Research Foun

1/10/17 → 31/12/18