Dr. Manoj Upadhya
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## Research Interests

I am interested in the behavioural aspects and molecular mechanisms of pain. My research work primarily involves the behavioural and functional assessment, and modulation of TRP ion channels in sensory neurons under physiological and disease conditions, and how they contribute to hyperalgesia.

Prior to this assignment, my work was directed towards investigating the physiological and functional role of CART peptide in neurological disorders employing rats and mice as experimental models. I demonstrated that endogenous CART potentiates spatial learning and memory behaviour and modulates the effects of cholinergic agents in the management of Alzheimer's disease like conditions in rats. I showed that CART in accumbens shell in brain serve as an essential component of the opiod-mesolimbic dopaminergic reward system. Further I studied that CART also process predator induced fear in the neuronal circuitry that operates across the hypothalamo-amygdalar circuit. Later I demonstrated the role of CART as neuroprotective agent in the prevention of Parkinson's disease and Huntington's disease since it increased the dopamine content in brain. CART also modulates the neuropathic pain and closely interacts with the glucocorticoids in nerve damage ailments like spinal cord injury. Thus, I concluded that upregulation of endogenous CART system might serve as fruitful strategy in the treatment of a range of pathophysiological conditions and neurodegenerative diseases. This research work has led to several high impact publications in journals like Addiction Biology, Neuropharmacology, Behavioural Brain Research, Brain Research, Peptides, Life Sciences, Neuropeptides, etc.

Before joining IISER Pune, I worked with Drug Discovery Biology team at Sun Pharma Advanced Research Company Ltd., India (SPARC), a leading pharmaceutical company.  With SPARC, I served as Lead Scientist for the assessment of molecules in Parkinson's, Alzheimer's and Huntington's diseases. We proposed one SPARC molecule as a drug candidate for Parkinson's disease therapy, and could publish one international patent in WIPO entitled "Treatment for Parkinson's disease".

Techniques expertise: Behavioural Pharmacology, Immunohistochemistry, Transcardial perfusions, Neuroanatomy and Brain dissection, Molecular Biology

## Qualifications

PhD, University Department of Pharmaceutical Sciences, RTM Nagpur University
19 Sep 2009 → 26 Mar 2013
Award Date: 26 Mar 2013

## Employment

**College of Health and Life Sciences**
Birmingham, United Kingdom
15 Apr 2019 → present

**Postdoctoral Research Associate**
Aston Pharmacy School
College of Health and Life Sciences
15 Apr 2019 → present

## Research outputs

### Encephalitis patient-derived monoclonal GABAA receptor antibodies cause epileptic seizures
Kreye, J., Wright, S. K., van Casteren, A., Stöffler, L., Machule, M-L., Reincke, S. M., Nikolaus, M., van Hoof, S., Sanchez-Sendin, E., Homeyer, M. A., Cordero Gómez, C., Kornau, H-C., Schmitz, D., Kaindl, A. M., Boehm-Sturm, P., Mueller, S., Wilson, M. A., Upadhya, M. A., Dhangar, D. R., Greenhill, S. & 9 others, Woodhall, G., Turko, P., Vida, I., Garner, C. C., Wickel, J., Geis, C., Fukata, Y., Fukata, M. & Prüss, H., 21 Sep 2021, (E-pub ahead of print) In: Journal of Experimental Medicine . 218, 11, e20210012.

### Multimodal electrophysiological analyses reveal that reduced synaptic excitatory neurotransmission underlies seizures in a model of NMDAR antibody-mediated encephalitis
Wright, S. K., Rosch, R. E., Wilson, M. A., Upadhya, M. A., Dhangar, D. R., Clarke-Bland, C., Wahid, T. T., Barman, S., Goebels, N., Kreye, J., Prüss, H., Jacobson, L., Bassett, D. S., Vincent, A., Greenhill, S. D. & Woodhall, G. L., 20 Sep 2021, In: Communications Biology. 4, 1, 1106.

### Transient systemic inflammation in adult male mice results in underweight progeny
Rokade, S., Upadhya, M., Bhat, D. S., Subhedar, N., Yajnik, C. S., Ghose, A., Rath, S. & Bal, V., Jul 2021, In: American Journal of Reproductive Immunology. 86, 1, e13401.

### In vitro characterisation and neurosteroid treatment of an N-Methyl-D-Aspartate receptor antibody-mediated seizure model
Wright, S. K., Rosch, R. E., Wilson, M. A., Upadhya, M. A., Dhangar, D. R., Clarke-Bland, C., Wahid, T. T., Barman, S., Goebels, N., Kreye, J., Prüss, H., Jacobson, L., Bassett, D. S., Vincent, A., Greenhill, S. D. & Woodhall, G. L., 22 Dec 2020.

### Nicotine-induced Brain Stimulation Reward is Modulated by Melanocortin-4 Receptors in Ovariectomized Rats
Upadhya, M. A., Upadhya, H. M., Borkar, C. D., Choudhary, A. G., Singh, U., Chavan, P., Sakharkar, A., Singru, P., Subhedar, N. K. & Kokare, D. M., 1 Apr 2020, In: Neuroscience. 431, p. 205-221 17 p.

### Transient Receptor Potential Vanilloid 3 (TRPV3) in the Cerebellum of Rat and Its Role in Motor Coordination
Singh, U., Upadhya, M., Basu, S., Singh, O., Kumar, S., Kokare, D. M. & Singru, P. S., 1 Jan 2020, In: Neuroscience. 424 , p. 121-132 12 p.

### TREATMENT FOR PARKINSON'S DISEASE
DAMLE, NITIN. KRISHNAJI., MANDHANE, SANJAY. NANDLALJI., Upadhya, M., MEHETRE, SAMEER. VISHWANATH., CHIDREWAR, GAJANAN. UTTAMRAO., SENGUPTA, PRABAL. & CHITTURI, TRINADHA. RAO., 10 Apr 2019, Patent No. EP3463351, Priority No. IN201621019087 20160602 ; IN201621019185 20160602 ; WO2017IN50224 20170602

### Neuroprotective effect of agmatine in mouse spinal cord injury model: Modulation by imidazoline receptors
DIxit, M., Upadhya, M., Taksande, B., Raut, P., Umekar, M. & Kotagale, N., 1 Jul 2018, In: Journal of Natural Science, Biology and Medicine. 9, 2, p. 115-120 6 p.

### TREATMENT FOR PARKINSON'S DISEASE
DAMLE, NITIN. KRISHNAJI., MANDHANE, SANJAY. NANDLALJI., Upadhya, M., MEHETRE, SAMEER. VISHWANATH., CHIDREWAR, GAJANAN. UTTAMRAO., SENGUPTA, PRABAL. & CHITTURI, TRINADHA. RAO., 7 Dec 2017, IPC No. A61K 31/44, A61K 31/47, A61P 25/16, Patent No. WO2017208267, 2 Jun 2017, Priority date 2 Jun 2016, Priority No. 201621019087; 201621019185

### Neuropeptide Y system in accumbens shell mediates ethanol self-administration in posterior ventral tegmental area: AcbSh NPY in ethanol reward
Borkar, C. D., Upadhya, M., Shelkar, G. P., Subhedar, N. K. & Kokare, D. M., Jul 2016, In: Addiction Biology. 21, 4, p. 766-775

### CART modulates the effects of levodopa in rat model of Parkinson's disease
Upadhya, M., Shelkar, G. P., Subhedar, N. K. & Kokare, D. M., 15 Mar 2016, In: Behavioural Brain Research. 301, p. 262-272

**Involvement of hypothalamic neuropeptide Y in pentazocine induced suppression of food intake in rats**
Kotagale, N. R., Upadhya, M., Hadole, P. N., Kokare, D. M. & Taksande, B. G., 1 Jun 2014, In: Neuropeptides. 48, 3, p. 133-141

**CART in the brain of vertebrates: Circuits, functions and evolution**
Subhedar, N. K., Nakhate, K. T., Upadhya, M. A. & Kokare, D. M., 1 Apr 2014, In: Peptides. 54, p. 108-130

**A simple and economical method of electrode fabrication for brain self-stimulation in rats**
Desai, S. J., Bharne, A. P., Upadhya, M. A., Somalwar, A. R., Subhedar, N. K. & Kokare, D. M., 1 Mar 2014, In: Journal of Pharmacological and Toxicological Methods. 69, 2, p. 141-149

**NPY mediates reward activity of morphine, via NPY Y1 receptors, in the nucleus accumbens shell**
Desai, S. J., Upadhya, M. A., Subhedar, N. K. & Kokare, D. M., 15 Jun 2013, In: Behavioural Brain Research. 247, p. 79-91

**Cocaine- and amphetamine-regulated transcript peptide (CART) in the central nucleus of amygdala potentiates behavioral and hormonal responses of the rat exposed to its predator**
Upadhya, M. A., Kokare, D. M. & Subhedar, N. K., 15 Apr 2013, In: Behavioural Brain Research. 243, p. 129-137

**Neuroprotective effect of cocaine- and amphetamine-regulated transcript peptide in spinal cord injury in mice**
Bharne, A. P., Upadhya, M. A., Shelkar, G. P., Singru, P. S., Subhedar, N. K. & Kokare, D. M., 1 Apr 2013, In: Neuropharmacology. 67, p. 126-135

**CART peptide in the nucleus accumbens shell acts downstream to dopamine and mediates the reward and reinforcement actions of morphine**
Upadhya, M. A., Nakhate, K. T., Kokare, D. M., Singh, U., Singru, P. S. & Subhedar, N. K., 1 Mar 2012, In: Neuropharmacology. 62, 4, p. 1823-1833

**Nicotine evoked improvement in learning and memory is mediated through NPY Y1 receptors in rat model of Alzheimer's disease**
Rangani, R. J., Upadhya, M. A., Nakhate, K. T., Kokare, D. M. & Subhedar, N. K., 1 Feb 2012, In: Peptides. 33, 2, p. 317-328

**Cocaine- and amphetamine-regulated transcript peptide increases spatial learning and memory in rats**
Upadhya, M. A., Nakhate, K. T., Kokare, D. M., Singru, P. S. & Subhedar, N. K., 14 Feb 2011, In: Life Sciences. 88, 7-8, p. 322-334

**Effect of alpha-melanocyte stimulating hormone on locomotor recovery following spinal cord injury in mice: Role of serotonergic system**
Bharne, A. P., Upadhya, M. A., Kokare, D. M. & Subhedar, N. K., 1 Feb 2011, In: Neuropeptides. 45, 1, p. 25-31

**Evidence for the participation of cocaine- and amphetamine-regulated transcript peptide (CART) in the fluoxetine-induced anti-hyperalgesia in neuropathic rats**
Upadhya, M. A., Dandekar, M. P., Kokare, D. M., Singru, P. S. & Subhedar, N. K., 1 Feb 2011, In: Peptides. 32, 2, p. 317-326

**Neuropeptide Y Y1 receptors in the central nucleus of amygdala mediate the anxiolytic-like effect of allopregnanolone in mice: Behavioral and immunocytochemical evidences**
Deo, G. S., Dandekar, M. P., Upadhya, M. A., Kokare, D. M. & Subhedar, N. K., 8 Mar 2010, In: Brain Research. 1318, p. 77-86

**Involvement of neuropeptide Y in the acute, chronic and withdrawal responses of morphine in nociception in neuropathic rats: Behavioral and neuroanatomical correlates**
Upadhya, M. A., Dandekar, M. P., Kokare, D. M., Singru, P. S. & Subhedar, N. K., 1 Aug 2009, In: Neuropeptides. 43, 4, p. 303-314

**Neuropeptide Y modulates the antidepressant activity of imipramine in olfactory bulbectomized rats: Involvement of NPY Y1 receptors**
Goyal, S. N., Upadhya, M. A., Kokare, D. M., Bhisikar, S. M. & Subhedar, N. K., 17 Apr 2009, In: Brain Research. 1266, p. 45-53

**Central administration of selective melanocortin 4 receptor antagonist HS014 prevents morphine tolerance and withdrawal hyperalgesia.**
Upadhya, M., 21 Nov 2007, In: Brain Research. 1181, p. 10-20

## Activities

**Neuropathic Pain and Experimental Spinal Cord Injury in Rodents**
Manoj Upadhya (Speaker)
31 Jul 2020

**Speaker and Resource Person at the Pre-conference Workshop of 48th Annual conference of Indian Pharmacological Society (IPSCON-2015) and International conference on Cutting-Edge Pharmacology: Contemporary Issues and Future Challenges, on "Surgical and Behavioral Techniques in Neuropharmacology"**
Manoj Upadhya (Speaker)
17 Dec 2015

**Resource Person and Speaker**
Manoj Upadhya (Speaker)
5 Jan 2013 → 7 Jan 2013

**Resource Person and Speaker**
Manoj Upadhya (Speaker)
27 Feb 2010 → 28 Feb 2010

**Teaching Assistant**
Manoj Upadhya (Speaker)
27 Jan 2008 → 13 Feb 2008

## Prizes

**All India Rank 371 out of 11698 in GATE-2005**
Upadhya, Manoj (Recipient), 15 Mar 2005

**Best Paper Award in Pharmacology and Toxicology**
Upadhya, Manoj (Recipient), 3 Dec 2006

**Best Poster Award**
Upadhya, Manoj (Recipient), 14 Dec 2008

**Best Poster Award**
Upadhya, Manoj (Recipient), 18 Dec 2013

**Best Publication in Peer-Reviewed Journal Category**
Upadhya, Manoj (Recipient), 23 Oct 2016

**Executive Master of Business Administration (EMBA)**
Upadhya, Manoj (Recipient), 10 Aug 2015

**Fellowship by University Grants Commission, India**
Upadhya, Manoj (Recipient), 17 Jul 2005

**Gayle A. Olson & Richard D. Olson prize**
Upadhya, Manoj (Recipient), 1 Feb 2012

**JRF and SRF by Department of Science and Technology, India**
Upadhya, Manoj (Recipient), 15 Mar 2008

**Prof. Ch. R. K. Murthy Memorial Prize**
Upadhya, Manoj (Recipient), 11 Jan 2012

**Professor Govinda Achari Prize**
Upadhya, Manoj (Recipient), 22 Dec 2006

**Prof. Govinda Achari Prize**
Upadhya, Manoj (Recipient), 20 Dec 2008

**Prof. Govinda Achari Prize**
Upadhya, Manoj (Recipient), 16 Dec 2010

**Prof. O. D. Gulati Prize**
Upadhya, Manoj (Recipient), 21 Dec 2011