

Table S1: Optogenetic manipulations of mPFC circuitry in mice and rats. Constructs are indicated as specified in the corresponding article. tg = transgenic mouse/rat; AAV = Adeno-Associated virus (number indicates serotype); LV = Lenti virus; HSV = Herpes Simplex virus; PRV = Pseudorabies virus

Study	Region of opsin expression	Region of optic stimulation	Construct	Neuronal Subtype	Readout
ANATOMY – layers and connectivity of the mPFC					
Kvitsiani et al., 2013	dmPFC	ACC	(tg)PV::Cre (tg)SOM::Cre (AAV2/9)EF1a::DIO-ChR2-eYFP (AAV2/9)EF1a::DIO-Arch-eYFP	PV + SOM Interneurons	<i>in vivo</i> recordings
Cruikshank et al., 2012	Thalamus	mPFC (L1)	(LV)Syn1::ChR2(H134R)-eYFP-WPRE	Non-specific	<i>ex vivo</i> recordings
	PLC	mPFC (L3)	(AAV)CaMKIIα::hChR2(H134R)-eYFP (tg)MR90::Cre (AAV)EF1a::DIO-hChR2(H134R)-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings
Little & Carter, 2013	PLC(L2)	PLC BLA	(AAV2/9)CAG::hChR2-mCherry	Non-specific	<i>ex vivo</i> recordings
Lee et al., 2014a	mPFC	mPFC	(AAV)CaMKIIα::ChR2-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings
			(tg)PV::Cre (tg)SOM::Cre (AAV)EF1α::DIO-ChR2-eYFP	PV + SOM Interneurons	<i>ex vivo</i> recordings
Land et al., 2014	mPFC	mPFC	(tg)Drd1a::Cre (AAV)EF1α::DIO-ChR2-eYFP	D1-R pyramidal neurons	<i>ex vivo</i> recordings
Little & Carter, 2012	MTN	PLC (L2)	(AAV)ChR2-Venus (AAV)hChR2-mCherry	Pyramidal neurons projecting to mPFC	<i>ex vivo</i> recordings
	mPFC				
	BLA				
	vHPC				
Ji & Neugebauer, 2012	ILC	ILC	(AAV5)CaMKIIα::ChR2(H134R)-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings
Lee et al., 2014b	mPFC	NAcc	(tg)Dlx12b::Cre (AAV5)EF1α::DIO-ChR2-eYFP	GABAergic neurons	<i>ex vivo</i> recordings Real-time Place Preference
Hübner et al., 2014	mPFC	BLA	(AAV)CAG::hChR2(H134R)-mCherry (AAV)hSyn::hChR2(H134R)-eYFP	Non-specific	<i>ex vivo</i> recordings
COGNITION - working memory, alertness and temporal control					
Gilmartin et al., 2013	PLC	PLC	(AAV9)CAG::ArchT-GFP	Non-specific	<i>in vivo</i> recordings Fear-conditioning
Rossi et al., 2012	PLC	PLC	(tg)PV::Cre (AAV5)EF1α::DIO-hChR2(H134R)-eYFP	PV interneurons	Delayed Alternation Task
Zhang et al., 2013	LC	mPFC	(tg)TH::IRES-Cre (AAV5)EF1α::DIO-hChR2(H134R)-eYFP	NA neurons	<i>ex vivo</i> recordings
Carter et al., 2010	LC	LC	(tg)TH::IRES-Cre (AAV5)Eflα-eNpHR-eYFP	NA neurons	<i>ex vivo</i> recordings <i>in vivo</i> recordings Wakefulness
Narayanan et al., 2012	mPFC	mPFC	(tg)D1::Cre (AAV)EF1α::DIO-hChR2(H134R)-eYFP	D1-R pyramidal neurons	<i>ex vivo</i> recordings Fixed-interval Timing task
			(tg)D1::Cre (AAV)EF1α::DIO-eNpHR 3.0-eYFP		
COGNITION – learning, memory and extinction					
Courtin et al., 2014	dmPFC	dmPFC	(tg)PV::IRES-Cre (AAV9)FLEX-ArchT-GFP (AAV5)EF1α::DIO-hChR2(H134R)-eYFP	PV Interneurons	<i>in vivo</i> recordings Fear-conditioning
Cho et al., 2013	mPFC	BLA	(AAV5)CaMKIIα:: ChR2(H134R)-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings Fear-conditioning
		mPFC			
COGNITION – habitual behavior					
Smith et al., 2012	ILC	ILC	(AAV5)CaMKIIα::eNpHR3.0-eYFP	Pyramidal	<i>in vivo</i> recordings

				neurons	T-maze task
Smith & Graybiel 2013	ILC	ILC	(AAV5)CaMKII α ::eNpHR3.0-eYFP	Pyramidal neurons	<i>in vivo</i> recordings T-maze task
PSYCHIATRIC DISORDERS – depression					
Convington et al. 2010	mPFC	mPFC	(HSV)IE4/5::ChR2-mCherry	Non-specific	Social Defeat
Kumar et al., 2013	PLC (L5)	PLC (L5)	(tg)Thy1::ChR2-eYFP	Pyramidal neurons	<i>in vivo</i> recordings Social Defeat
Warden et al., 2012	mPFC	DRN LHb	(AAV5)CaMKII α ::ChR2-eYFP	Pyramidal neurons	<i>in vivo</i> recordings Force Swim Test
Challis et al., 2014	vmPFC	DRN	(AAV2/9)CaMKII α ::ChR2-eYFP (tg) CaMKII α ::Cre (AAV2/9)EF1 α ::DIO-hChR2(H134R)-eYFP (AAV2/9)CBA::flex-Arch-GFP	Pyramidal neurons	<i>ex vivo</i> recordings Social Defeat
Vialou et al., 2014	PLC	NAc BLA	(AAV)CaMKII α ::ChR2-eYFP	Pyramidal neurons	Social Defeat
Chaudhury et al., 2013	VTA	VTA (DA neurons projecting to mPFC)	(PRV)Cre (AAV)DIO-ChR2-eYFP (AAV)DIO-NpHR-eYFP	VTA DA neurons	<i>in vivo</i> recordings Social Defeat
Friedman et al., 2014	VTA	VTA (mPFC projections)	(tg)TH::IRES-Cre (AAV)DIO-ChR2-eYFP	VTA DA neurons	<i>ex vivo</i> recordings Social Defeat
Gunaydin et al., 2014	VTA	mPFC	(tg)TH::Cre (AAV5)EF1 α ::DIO-ChR2-eYFP	VTA DA neurons	<i>in vivo</i> fiber photometry Social Interaction Place avoidance
PSYCHIATRIC DISORDERS – schizophrenia					
Gee et al., 2012	mPFC	mPFC	(tg)Drd1::Cre (AAV)DIO-ChR2-eYFP (tg)Drd2::Cre (AAV)DIO-ChR2-eYFP (AAV)CaMKII α ::ChR2-eYFP	D1-R pyramidal neurons D2-R pyramidal neurons Pyramidal neurons	<i>ex vivo</i> recordings
Yizhar et al., 2011	mPFC	mPFC	(AAV5)CaMKII α ::SSFO-eYFP (AAV5) CaMKII α ::C1V1-eYFP (tg)PV::Cre (AAV5)EF1 α ::DIO-SSFO-eYFP (AAV5)EF1 α ::DIO-C1V1-eYFP	Pyramidal neurons Interneurons	<i>in vivo</i> recordings Social Interaction Fear Conditioning
Sohal et al., 2009	mPFC	mPFC	(tg)PV::Cre (AAV5) EF1 α ::DIO-eNpHR-eYFP (AAV5)EF1 α ::ChR2 -eYFP (tg)Thy1::ChR2-eYFP	Interneurons Pyramidal neurons	<i>in vivo</i> recordings <i>ex vivo</i> recordings
PSYCHIATRIC DISORDERS – addiction					
Chen et al., 2013	PLC	PLC	(AAV)CaMKII α ::ChR2-eYFP (AAV)CamKII α ::eNpHR3.0-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings Cocaine Seeking
Van den Oever et al., 2013	vmPFC	vmPFC	(tg)CamKII α ::Cre (AAV2) EF1 α ::DIO- ChR2(H134R)-eYFP (AAV2) EF1 α ::DIO-eNpHR 3.0-eYFP (AAV2)CaMKII α :: ChR2(H134R)-eYFP (AAV2)CaMKII α ::eNpHR3.0-EYFP	Pyramidal neurons	<i>ex vivo</i> recordings Cocaine Conditioned Place Preference
Stefanik et al., 2013	PLC	PLC NAc core	(AAV2)hSyn::eNpHR3.0-eYFP (AAV2)CAG-ArchT-GFP	Non-specific Non-specific	Cocaine Seeking
Stefanik & Kalivas, 2013	BLA	PLC	(AAV2)CAG-ArchT-GFP	Non-specific	Cocaine Seeking
Calu et al., 2013	dmPFC	dmPFC	(pAAV)CaMKII α ::eNpHR3.0-eYFP	Pyramidal neurons	<i>in vivo</i> recordings Food Seeking
Sparta et al., 2014	PLC	PLC	PV::Cre (AAV)EF1 α ::DIO-ChR2(H134R)-eYFP	Interneurons	<i>ex vivo</i> recordings <i>in vivo</i> recordings Sucrose seeking

Suska et al., 2013	ILC	NAc	(AAV2)CAG::ChR2Y(h134R)-eYFP	Non-specific	<i>ex vivo</i> recordings
Martin-Garcia et al., 2014	PLC	PLC	(AAV5)CaMKII α ::hChR2(H134R)-eYFP (AAV5)CaMKII α ::ArchT-eYFP	Pyramidal neurons	Cocaine Taking Cocaine Seeking
Ma et al., 2014	ILC	NAc shell	(AAV2)CaMKII α ::hChR2(H134R)-venus	Pyramidal neurons	<i>ex vivo</i> recordings Cocaine Seeking
	PLC	NAc core			
Pascoli et al., 2012	ILC	NAc shell	(AAV1)ChR2-eYFP	pyramidal neurons	<i>ex vivo</i> recordings Locomotor sensitization
Pascoli et al., 2014	ILC	NAc	(AAV1)CAG::ChR2-eYFP	pyramidal neurons	<i>ex vivo</i> recordings <i>in vivo</i> recordings Cocaine Seeking
Seif et al., 2013	mPFC	NAc core	(AAV)CaMKII α ::eNpHR3.0-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings Alcohol Taking Alcohol Seeking
Stuber et al., 2011	mPFC	NAc	(AAV5)CaMKII α ::hChR2(H134R)-eYFP	Pyramidal neurons	Optical self-stimulation
Britt et al., 2012	mPFC	NAc shell	(AAV)CaMKII α ::ChR2-eYFP (AAV)CaMKII α ::NpHR-eYFP	Pyramidal neurons	<i>ex vivo</i> recordings Locomotor sensitization Place preference Optical self-stimulation