

## The Journal of Neuroscience

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The Journal of Neuroscience, 10 October 2012, 32(41): i;

## This Week in The Journal

## Cellular/Molecular

*PACAP Potentiates Synapses in the Amygdala*

Jun-Hyeong Cho, Ko Zushida, Gleb P. Shumyatsky, William A. Carlezon Jr., Edward G. Meloni, et al.

(see pages 14165–14177)

Pituitary adenylate cyclase-activating polypeptide (PACAP) and its receptors are expressed throughout the body and brain, and they regulate diverse processes including food intake, circadian rhythms, learning, stress responses, and anxiety. Furthermore, elevated PACAP levels and a mutation in a PACAP receptor have been linked to posttraumatic stress disorder in women. PACAP and its receptors are highly expressed in the amygdala, and Cho et al. report that PACAP enhances excitatory transmission between the basolateral (BLA) and the lateral division of the central (CeL) amygdalar nuclei. This effect was mediated by PACAP receptor VPAC1 and required postsynaptic increases in  $\text{Ca}^{2+}$ , activation of  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinase II and protein kinase A, and synaptic delivery of AMPA receptors. PACAP-induced potentiation increased spiking in CeL neurons in response to a given intensity of BLA stimulation. The source of PACAP, which population of CeL neurons exhibit this potentiation, and the effect potentiation has on fear responses remain to be explored.

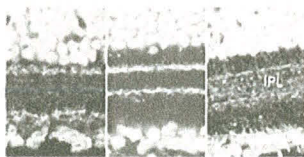
## Development/Plasticity/Repair

*Contactins Guide Neurite Arborization in Retina*

Masahito Yamagata and Joshua R. Sanes

(see pages 14402–14414)

Parallel processing of visual information begins in the retina, where photoreceptors transmit information to ten different types of bipolar cells. Axons of bipolar cell subtypes terminate in specific sublaminae of the inner plexiform layer (IPL), where they synapse with different subtypes of amacrine and ganglion cell. Four closely related adhesion molecules of the immunoglobulin superfamily (IgSF) are expressed in nonoverlapping populations of chicken amacrine and ganglion cells, and these molecules have been proposed to direct dendritic arborization in the correct sublamina of the IPL. But ~40% of cells do not express these proteins. Yamagata and Sanes suggest that the remaining cells are guided by another related group of molecules, contactins 1–5. Contactins were expressed in mostly non-overlapping sets of amacrine and ganglion cells, and cells expressing contactin-2 were generally distinct from those expressing other IgSF proteins. After contactin-2 knockdown, neurites arborized more broadly within the IPL, whereas ectopic expression of contactin-2 redirected processes to arborize in sublaminae that endogenously expressed contactin-2.



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Contactin (red)-1 (left), -2 (middle), and -3 (right) are expressed in different sublaminal patterns in the IPL. See the article by Yamagata and Sanes for details.

## Behavioral/Systems/Cognitive

*L-DOPA Improves Episodic Memory in Humans*

Rumana Chowdhury, Marc Guitart-Masip, Nico Bunzeck, Raymond J. Dolan, and Emrah Düzel

(see pages 14193-14204)

Long-term potentiation of hippocampal synapses encodes memories for events and places, but new proteins must be synthesized for potentiation to persist. Hippocampal dopamine release appears to be required for the induction of protein synthesis and thus for long-term memory retention. This might explain why rewarding, aversive, or novel events—all of which evoke dopamine release—are better remembered than neutral events. It may also help to explain declining episodic memory in older people, given that dopaminergic neurons often degenerate with age. If so, enhancing dopaminergic signaling might improve episodic memory in the elderly. Chowdhury et al. investigated this possibility by administering L-DOPA or placebo to subjects who viewed pictures of indoor and outdoor scenes. Consistent with a specific role for dopamine in memory persistence, L-DOPA improved memory for scenes after 6 h, but had no effect on memory after 2 h. This enhancement occurred only for doses within a narrow range, and it was absent if endogenous dopamine release was promoted by reward.

### Neurobiology of Disease

#### *PAR2 Mediates Orofacial Cancer Pain*

David K. Lam, Dongmin Dang, Jianan Zhang, John C. Dolan, and Brian L. Schmidt

(see pages 14178-14183)

Pain exacerbated by chewing is an early symptom of oral squamous cell carcinoma (SCC), and the pain worsens with cancer progression. Cancer pain might be induced by proteases, such as trypsin, which are secreted by malignant cells and have roles in tumor formation, survival, and metastasis. The targets of proteases include protease-activated receptors (PARs), which are present on both healthy and tumor cells. Notably, activation of PAR2 on nociceptors causes hypersensitivity. Lam et al. show that injecting supernatant from human SCC into mouse tongue caused acute orofacial pain, as indicated by latency to chew. Pain responses were attenuated by trypsin inhibitors, and were absent in PAR2-null mice. Persistent and chronic pain—produced by injecting SCC cells into the tongue or inducing tumors with carcinogens, respectively—were additionally associated with PAR2 upregulation in the trigeminal ganglion. The data suggest that trypsin-mediated activation of PAR2 causes orofacial cancer pain, and that upregulation of PAR2 in nociceptors leads to pain persistence.

### Related Articles

#### Articles - Behavioral/Systems/Cognitive:

Rumana Chowdhury, Marc Guitart-Masip, Nico Bunzeck, Raymond J. Dolan, and Emrah Düzel

#### **Dopamine Modulates Episodic Memory Persistence in Old Age**

The Journal of Neuroscience, 10 October 2012, 32(41):14193-14204;  
doi:10.1523/JNEUROSCI.1278-12.2012

[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)

#### Brief Communications:

David K. Lam, Dongmin Dang, Jianan Zhang, John C. Dolan, and Brian L. Schmidt

#### **Novel Animal Models of Acute and Chronic Cancer Pain: A Pivotal Role for PAR2**

The Journal of Neuroscience, 10 October 2012, 32(41):14178-14183;  
doi:10.1523/JNEUROSCI.2399-12.2012

[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)

#### Articles - Cellular/Molecular:

Jun-Hyeong Cho, Ko Zushida, Gleb P. Shumyatsky, William A. Carlezon, Jr., Edward G. Meloni, and Vadim Y. Bolshakov

#### **Pituitary Adenylate Cyclase-Activating Polypeptide Induces Postsynaptically Expressed Potentiation in the Intra-amygdala Circuit**

The Journal of Neuroscience, 10 October 2012, 32(41):14165-14177;  
doi:10.1523/JNEUROSCI.1402-12.2012

[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)

**Articles - Development/Plasticity/Repair:**

Masahito Yamagata and Joshua R. Sanes

**Expanding the Ig Superfamily Code for Laminar Specificity in  
Retina: Expression and Role of Contactins**

The Journal of Neuroscience, 10 October 2012, 32(41):14402-14414;

doi:10.1523/JNEUROSCI.3193-12.2012

[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)

PORTLAND CITY COUNCIL  
COMMUNICATION REQUEST  
Wednesday Council Meeting 9:30 AM

Council Meeting Date: 12-5-12

AUDITOR 11/07/12 AM 10:06

Today's Date 11-7-12

Name MARY ENG

Address 1417 SW 10<sup>th</sup> Ave #112

Telephone 503 5770963 Email maryeng1@gmail.com

Reason for the request:

Homeless Persons Experience  
Post Traumatic Stress Disorder  
~~in Portland, Oregon~~

(signed)

Mary Eng

- Give your request to the Council Clerk's office by Thursday at 5:00 pm to sign up for the following Wednesday Meeting. Holiday deadline schedule is Wednesday at 5:00 pm. (See contact information below.)
- You will be placed on the Wednesday Agenda as a "Communication." Communications are the first item on the Agenda and are taken promptly at 9:30 a.m. A total of five Communications may be scheduled. Individuals must schedule their own Communication.
- You will have 3 minutes to speak and may also submit written testimony before or at the meeting.

*Thank you for being an active participant in your City government.*

**Contact Information:**

Karla Moore-Love, City Council Clerk  
1221 SW 4th Ave, Room 140  
Portland, OR 97204-1900

(503) 823-4086 Fax (503) 823-4571  
email: Karla.Moore-Love@portlandoregon.gov

Sue Parsons, Council Clerk Assistant  
1221 SW 4th Ave., Room 140  
Portland, OR 97204-1900

(503) 823-4085 Fax (503) 823-4571  
email: Susan.Parsons@portlandoregon.gov

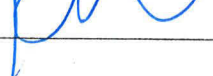
Request of Mary Eng to address Council regarding homeless persons experience  
post traumatic stress disorder (Communication)

DEC 05 2012

**PLACED ON FILE**

Filed NOV 30 2012

**LaVonne Griffin-Valade**  
Auditor of the City of Portland

By 

COMMISSIONERS VOTED AS FOLLOWS:		
	YEAS	NAYS
1. Fritz		
2. Fish		
3. Saltzman		
4. Leonard		
Adams		