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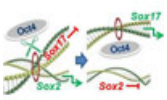
A cohesin–OCT4 complex mediates *Sox* enhancers to prime an early embryonic lineage

Nesrine Abboud, Thomas Moore- Morris, Emilye Hiriart, Henry Yang, Hudson Bezerra, Maria-Giovanna Gualazzi, Sonia Stefanovic, Anne-Claire Guénantin, Sylvia M. Evans, Michel Pucéat



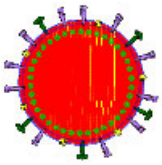
Higher order chromatin structures affect gene transcription, but how they determine cell fate is unclear. Here, the authors show that OCT4 and SALL4 alter the higher-order chromatin structure and mediate cell fate switching in embryonic cells by targeting cohesin and polycomb complexes, respectively.

08 Apr 2015 doi: 10.1038/ncomms7749

Biological Sciences Cell biology Molecular biology

Mammalian adaptation of influenza A(H7N9) virus is limited by a narrow genetic bottleneck OPEN

Hassan Zaraket, Tatiana Baranovich, Bryan S. Kaplan, Robert Carter, Min-Suk Song, James C. Paulson, Jerold E. Rehg, Justin Bahl, Jeri C. Crumpton, Jon Seiler, Michael Edmonson, Gang Wu, Erik Karlsson, Thomas Fabrizio, Huachen Zhu, Yi Guan, Matloob Husain, Stacey Schultz-Cherry, Scott Krauss, Ryan McBride, *et al.*



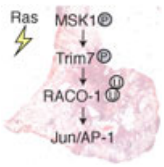
H7N9 bird flu viruses cause mild disease in poultry but can occasionally infect humans with fatal consequences. Here, the authors show that viral genetic diversification is low in ferrets and high in chickens, suggesting that a genetic bottleneck limits H7N9 adaptation to mammals

08 Apr 2015 doi: 10.1038/ncomms7553

Biological Sciences Evolution Microbiology Virology

The E3 ubiquitin ligase Trim7 mediates c-Jun/AP-1 activation by Ras signalling

Atanu Chakraborty, Markus E. Diefenbacher, Anastasia Mylona, Olivier Kassel, Axel Behrens



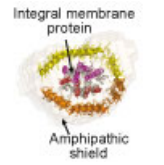
Ras signalling activates the transcription factor c-Jun/AP-1, but the mechanism was unclear. Here, Chakraborty *et al.* describe a phosphorylation–ubiquitination cascade involving MSK1 and the E3 ubiquitin ligases Trim7 and RACO-1, which mediates c-Jun activation in Ras-driven lung tumorigenesis.

08 Apr 2015 doi: 10.1038/ncomms7782

Biological Sciences Cancer Cell biology

Making water-soluble integral membrane proteins *in vivo* using an amphipathic protein fusion strategy OPEN

Dario Mizrachi, Yujie Chen, Jiayan Liu, Hwei-Ming Peng, Ailong Ke, Lois Pollack, Raymond J. Turner, Richard J. Auchus, Matthew P. DeLisa



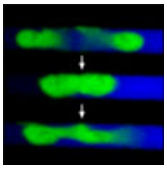
The study of integral membrane proteins (IMPs) is hampered by yields and the difficulty in retaining activity once they have been solubilized. Here Mizrachi *et al.* develop a strategy for *in vivo* expression and solubilization of IMPs in functionally relevant states by fusing them to truncated apolipoprotein A-I.

08 Apr 2015 doi: 10.1038/ncomms7826

Biological Sciences Biochemistry Biotechnology

Interplay between chemotaxis and contact inhibition of locomotion determines exploratory cell migration

Benjamin Lin, Taofei Yin, Yi I. Wu, Takanari Inoue, Andre Levchenko



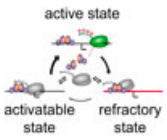
It remains unclear how conflicting guidance cues are reconciled during cell motility. Lin *et al.* show that cell repulsion normally provoked by cell–cell contact can be suppressed during attraction to a growth factor, highlighting a cell's ability to prioritize cues by evaluating input strengths.

08 Apr 2015 doi: 10.1038/ncomms7619

Biological Sciences Cell biology

Transcriptional refractoriness is dependent on core promoter architecture

François Cesbron, Michael Oehler, Nati Ha, Gencer Sancar, Michael Brunner



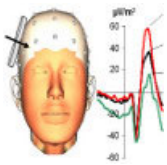
Genes are often transcribed in random bursts followed by long periods of inactivity. Here the authors show, by a light-inducible transcription system in *Neurospora*, that refractory promoters carry a physical memory of their previous transcription history.

08 Apr 2015 doi: 10.1038/ncomms7753

Biological Sciences Cell biology Molecular biology

A causal role of the right inferior frontal cortex in implementing strategies for multi-component behaviour

Gabriel Dippel, Christian Beste



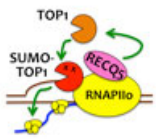
Complex behaviours, such as driving a car, require the organization and processing of several individual actions. Here, the authors use transcranial magnetic stimulation to demonstrate that the right inferior frontal gyrus determines the strategy used to sequence actions during complex behaviours.

08 Apr 2015 doi: 10.1038/ncomms7587

Biological Sciences Neuroscience

RECQ5-dependent SUMOylation of DNA topoisomerase I prevents transcription-associated genome instability

Min Li, Subhash Pokharel, Jiin-Tarng Wang, Xiaohua Xu, Yilun Liu



DNA topoisomerase I (TOP1) maintains DNA topology by relaxing supercoiled DNA during transcription. Here, the authors show that SUMOylation of TOP1 is necessary for its association with transcriptionally active RNA polymerase II and can reduce R-loops, preventing TOP1-induced DNA damage.

08 Apr 2015 doi: 10.1038/ncomms7720

Biological Sciences Cell biology Molecular biology

Hsp90 regulates the dynamics of its cochaperone Sti1 and the transfer of Hsp70 between modules OPEN

Alina Röhl, Daniela Wengler, Tobias Madl, Stephan Lagleder, Franziska Tippel, Monika Herrmann, Jelle Hendrix, Klaus Richter, Gordon Hack, Andreas B. Schmid, Horst Kessler, Don C. Lamb, Johannes Buchner

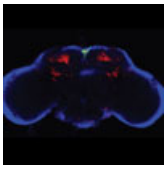
The chaperones Hsp70 and Hsp90 are physically linked via the cochaperone Sti1/Hop, that has two binding sites for Hsp70. Here, Röhl *et al.* show that binding of Hsp90 changes the conformation of Sti1/Hop and determines to which site Hsp70 binds, perhaps facilitating transfer of client proteins from Hsp70 to Hsp90.

08 Apr 2015 doi: 10.1038/ncomms7655

Biological Sciences Biochemistry

Metabolic learning and memory formation by the brain influence systemic metabolic homeostasis

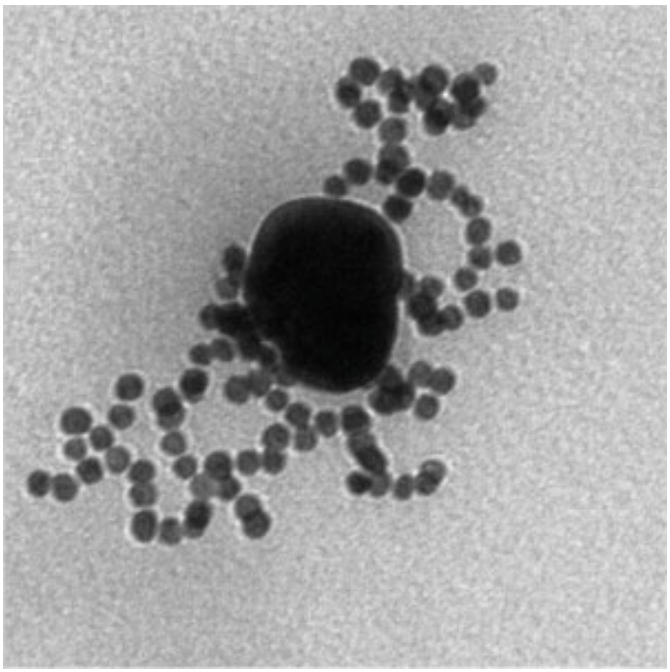
Yumin Zhang, Gang Liu, Jingqi Yan, Yalin Zhang, Bo Li, Dongsheng Cai



Flies can remember the caloric content of food. Here, the authors show that flies have a learned preference for normal caloric food, but this metabolic learning or memory is lost after forced consumption of a high-caloric diet, and identify key neuronal genes required for the formation of such memories.

07 Apr 2015 doi: 10.1038/ncomms7704

Biological Sciences Medical research Neuroscience



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Protein-adaptor with genetically encoded interaction-sites guiding the hierarchical assembly of plasmonically active nanoparticle architectures

A 40 nanometre gold nanoparticle is coated with chains of smaller gold nanoparticles (pictured), each linked to its neighbour by a protein-based adaptor with genetically encoded interaction sites. This protein-based molecular approach from **Schreiber *et al.*** results in the high-resolution bottom-up connection of nano-objects via adaptor complexes of similar size.

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