



COUCH OF SCIENCE



Model Organisms



giphy.com



@pintofsciencebe

#CouchofScience20

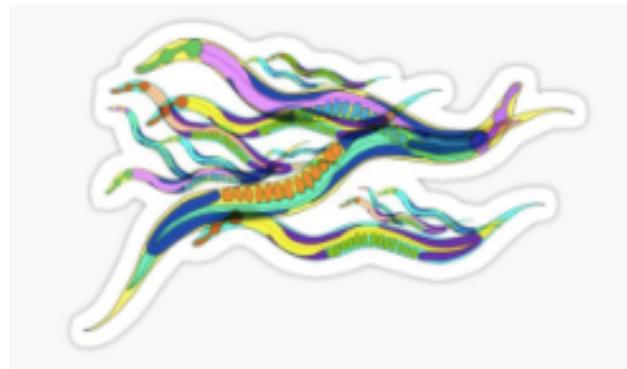
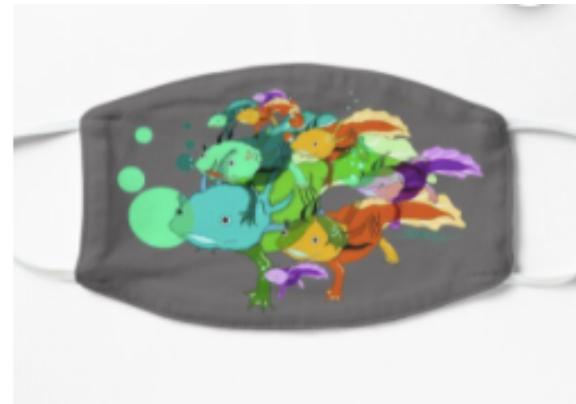
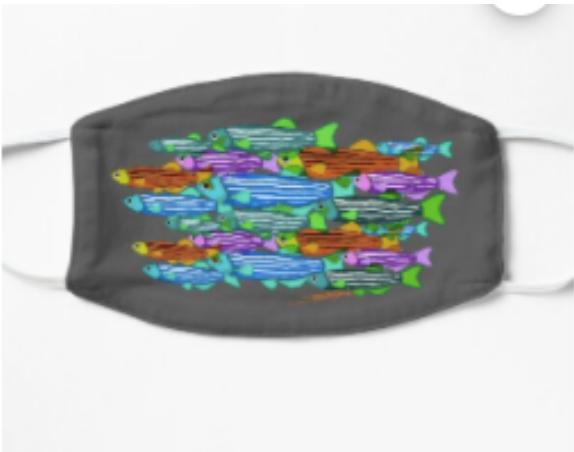




COUCH OF SCIENCE



Model organisms

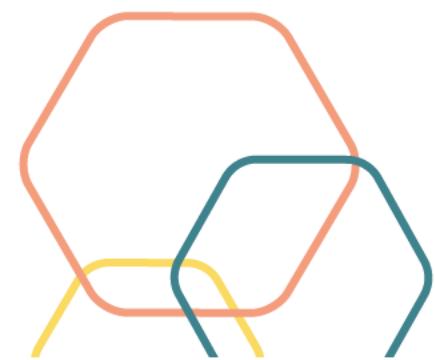


priyankaoberoi.redbubble.com/



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE

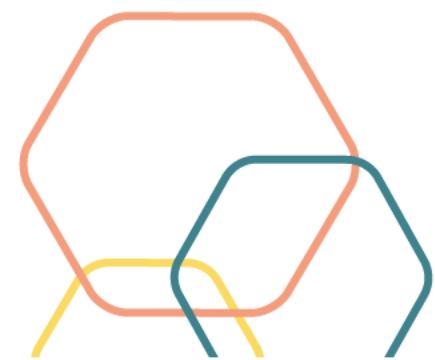


Why study animals



@pintofsciencebe

#CouchofScience20



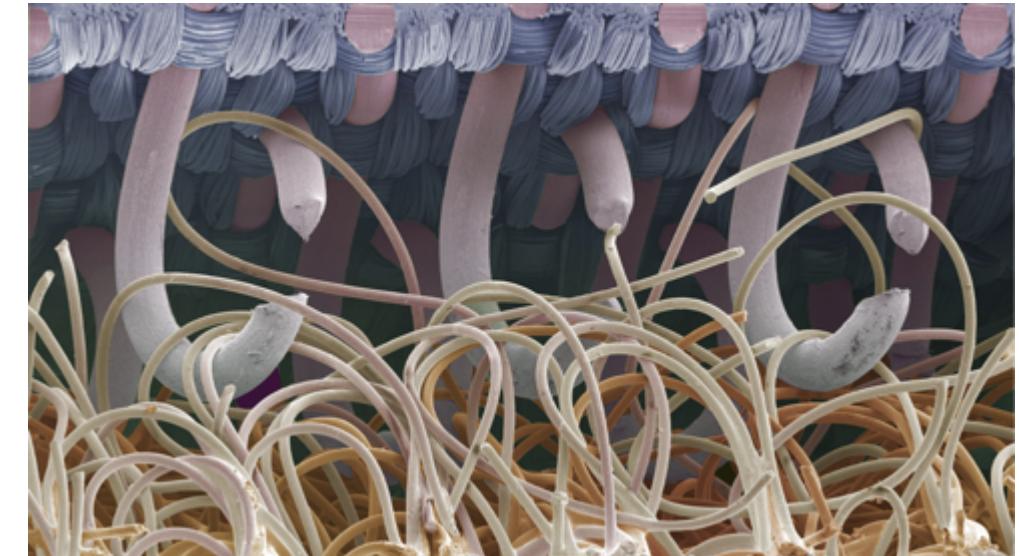


Biomimicry

COUCH OF SCIENCE



Georges de Mestral



<https://www.thoughtco.com/the-invention-of-velcro-4066111>

<https://medium.com/@shortformernie/velcro-history-hook-loop-a24a0ec42343>



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE



Biomimicry



Kingfisher birds deep dive in water



Redesigned front of Bullet train

<https://www.metrorailgeek.com/2019/04/what-japanese-shinkansen-learnt-from.html>



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE



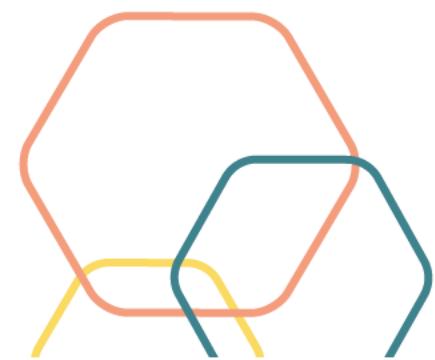
Why study animals

1. Learn engineering solutions to real-life problems



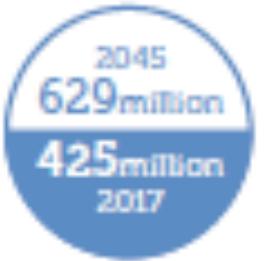
@pintofsciencebe

#CouchofScience20





Diabetes



1 in 11 adults has diabetes



COUCH OF SCIENCE



Blind Cave Fish May Hold Secret to Treating Diabetes

These eyeless fish have insatiable appetites and high blood sugar. Scientists are trying to figure out how they're in such good health.

2 MINUTE READ



BY SARAH GIBBENS

PUBLISHED MARCH 22, 2018

<https://www.nationalgeographic.com/news/2018/03/mexican-blind-eyeless-cavefish-diabetes-insulin-spd/>
#CouchofScience20



@pintofsciencebe





Cancer

CANCER Global Killer



The disease accounts for **7.4 million deaths worldwide**. It's the leading cause of death worldwide, causing around 13% of all deaths worldwide.

Executive Healthcare Management
www.executivehm.com

EHM
Executive Healthcare

COUCH OF SCIENCE



WIRED STAFF 11.06.12 10:45 AM

Why Blind Mole Rats Don't Get Cancer

<https://www.wired.com/2012/11/blind-mole-rat-cancer/>



@pintofsciencebe

#CouchofScience20

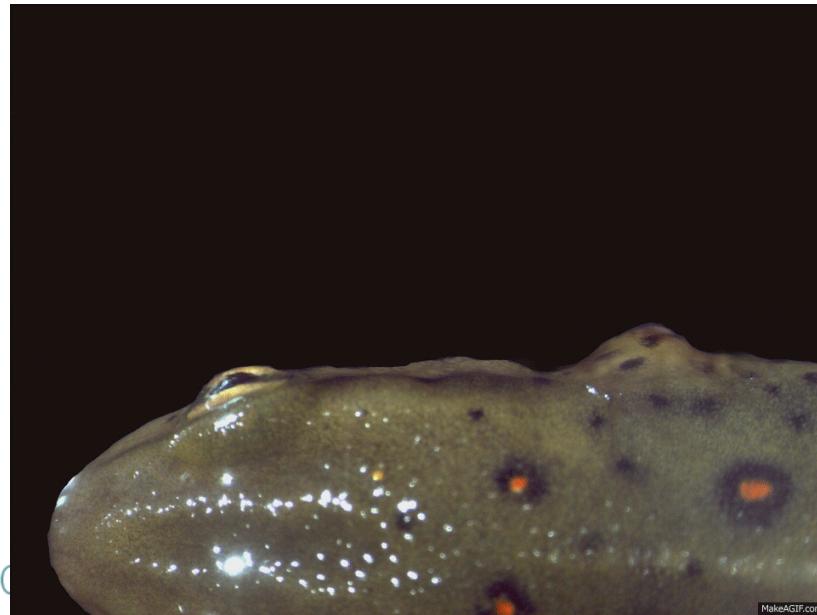




Regeneration



COUCH OF SCIENCE



@pintofsciencebe

#CouchofScience

MakeAGIF.com



COUCH OF SCIENCE



Why study animals

1. Learn engineering solutions to real-life problems

2. Learn medical solutions for human diseases
(Drug and Toxicology testing)



@pintofsciencebe

#CouchofScience20



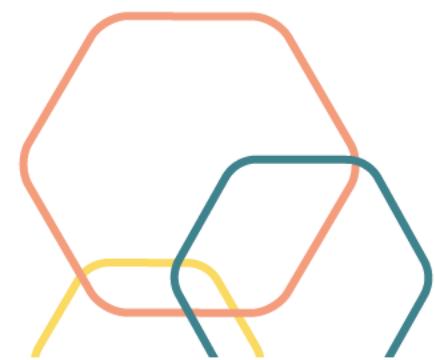


'What it means to be human' Lessons from animals



@pintofsciencebe

#CouchofScience20





What it means to be human?

- Society
- Problem Solving
- Tool Usage
- Learning
- Language (Singing)



@pintofsciencebe

#CouchofScience20



Animal Society



COUCH OF SCIENCE

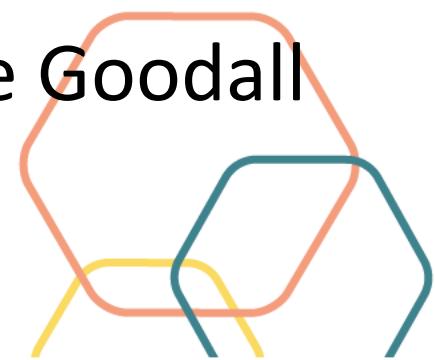


Jane Goodall



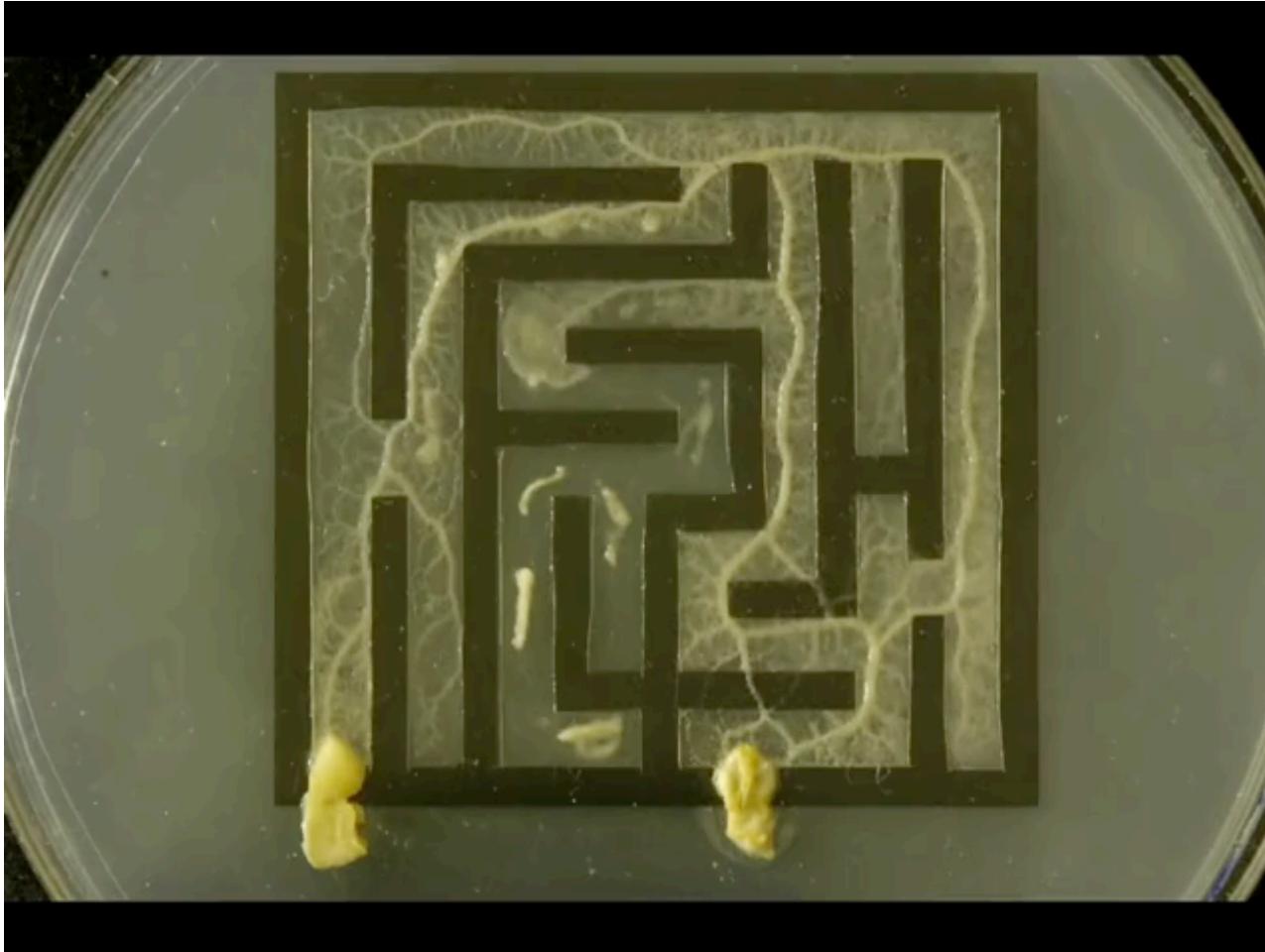
@pintofsciencebe

#CouchofScience20





Problem Solving



COUCH OF SCIENCE



Slime Mold



@pintofsciencebe

#CouchofScience20





Tool Usage

COUCH OF SCIENCE



Current Biology

REPORT | VOLUME 19, ISSUE 16, P1410-1414, AUGUST 25, 2009

Rooks Use Stones to Raise the Water Level to Reach a Floating Worm

Christopher David Bird • Nathan John Emery

Open Archive • Published: August 06, 2009 • DOI: <https://doi.org/10.1016/j.cub.2009.07.033>

[https://www.cell.com/current-biology/supplemental/S0960-9822\(09\)01455-9](https://www.cell.com/current-biology/supplemental/S0960-9822(09)01455-9)



@pintofsciencebe

#CouchofScience20





Memory



COUCH OF SCIENCE

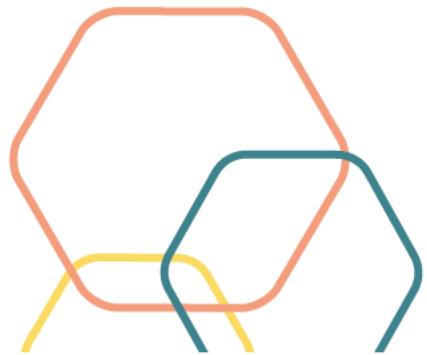


Marine mollusk *Aplysia*



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE



Long Term Momory

Siphon-Withdrawal Reflexes in Aplysia before and after whole-body long-term habituation training

<https://www.youtube.com/watch?v=wE54PPXgstM>



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE



Conditional Learning



HHMI

<https://www.youtube.com/watch?v=P7Qjjl-CN4U>

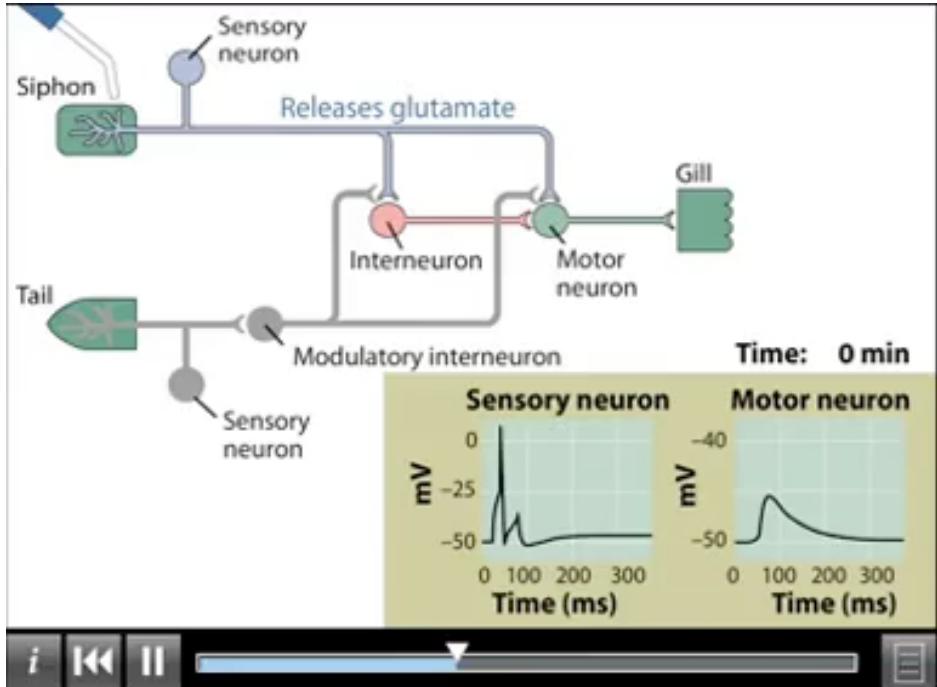


@pintofsciencebe

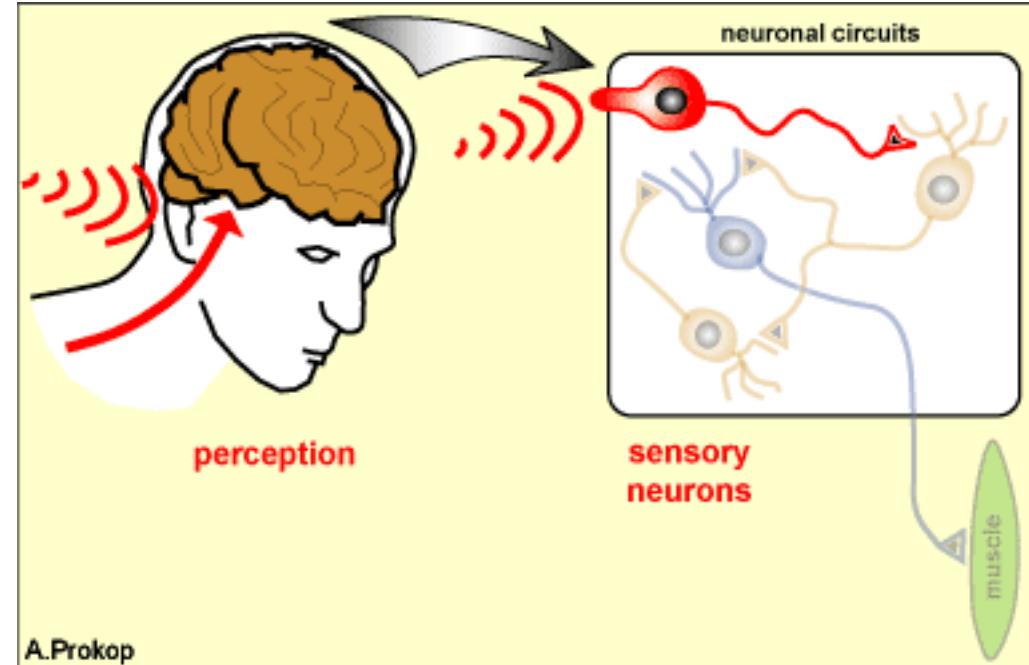
#CouchofScience20



Neuronal Circuit



Both habituation and sensitization appear to arise from plastic changes in synaptic transmission in this circuit. During habituation, transmission at the glutamatergic synapse between the sensory and motor neurons is depressed. This synaptic depression is thought to be responsible for the decreasing ability of siphon stimuli to evoke gill contractions during habituation.



<http://www.prokop.co.uk/Research/LAYMAN/1-brain-intro.html>



Eric Kandel Nobel Prize in 2000

COUCH OF SCIENCE



@pintofsciencebe

#CouchofScience20





Language (Singing)



COUCH OF SCIENCE



Adult male zebra finches will
sing more stereotyped
'directed' songs in the presence
of a female bird



@pintofsciencebe

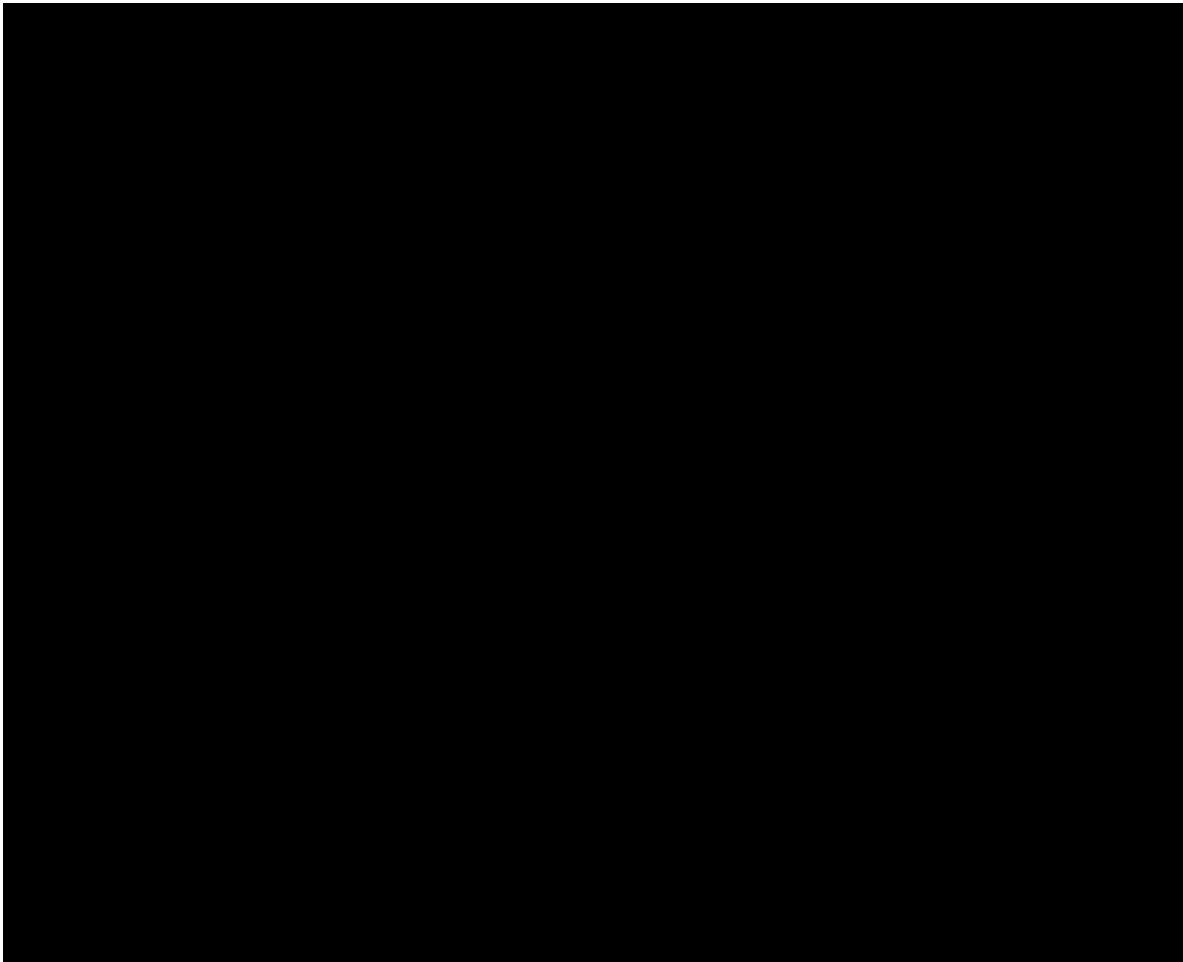
#CouchofScience20 <https://www.youtube.com/watch?v=cJjqdqoI6M8>



COUCH OF SCIENCE



Adults teach children

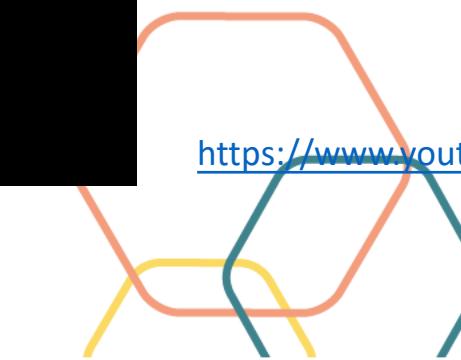


<https://www.youtube.com/watch?v=nvmrthgMHek>



@pintofsciencebe

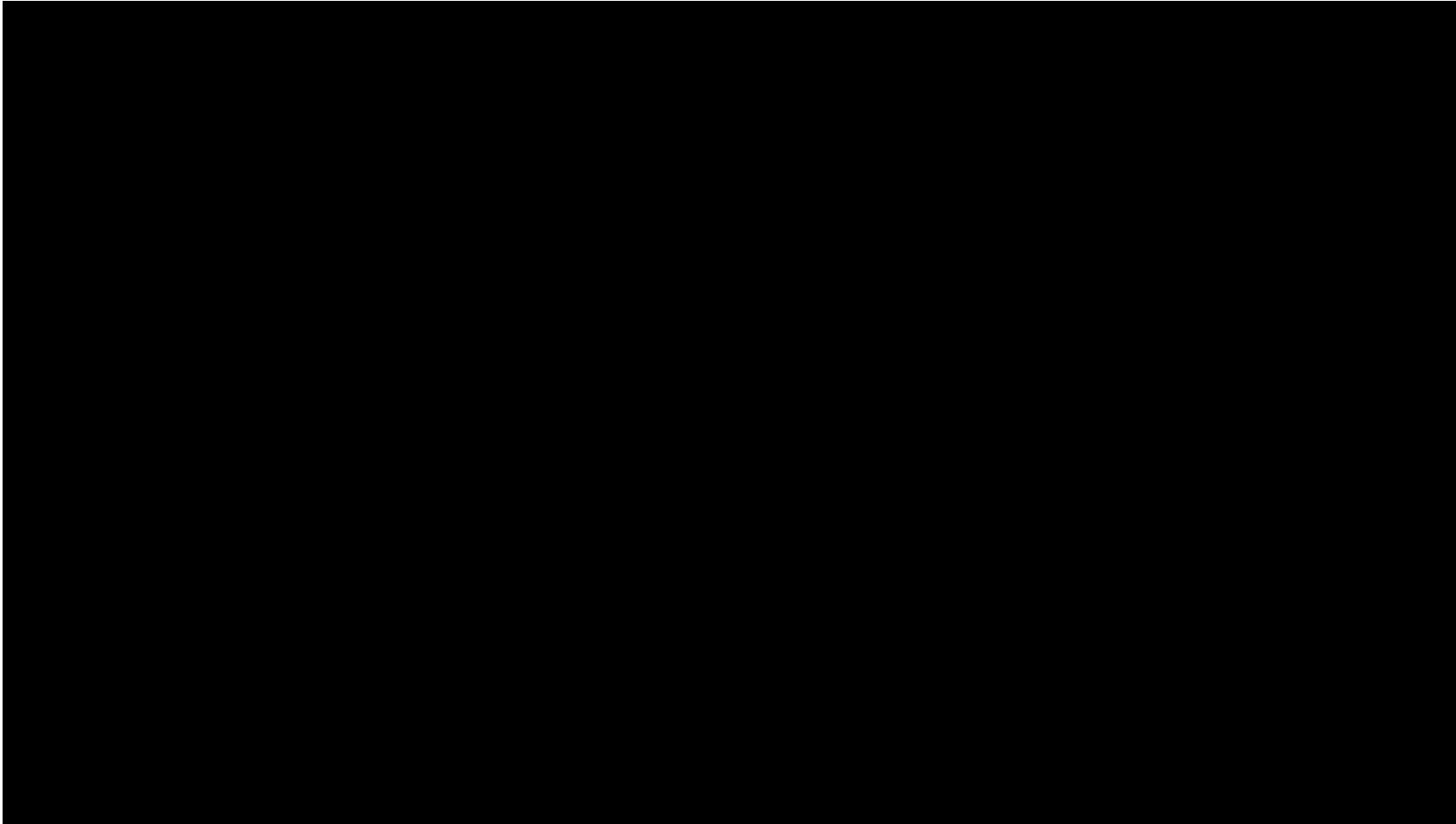
#CouchofScience20





Adults talk to eggs

COUCH OF SCIENCE



@pintofsciencebe

#CouchofScience20

<https://www.youtube.com/watch?v=fDg67kUPAcc>



Humans and Zebra finch use FoxP2 for speech

AJHG

Volume 76, Issue 6, June 2005, Pages 1074-1080

COUCH OF SCIENCE



Report

Identification of FOXP2 Truncation as a Novel Cause of Developmental Speech and Language Deficits

Kay D. MacDermot ^{1, 2}, Elena Bonora ^{1*}, Nuala Sykes ¹, Anne-Marie Coupe ¹, Cecilia S.L. Lai ^{1†}, Sonja C. Vernes ¹, Faraneh Vargha-Khadem ³, Fiona McKenzie ⁴, Robert L. Smith ⁴, Anthony P. Monaco ¹, Simon E. Fisher ¹ ☰ ☱



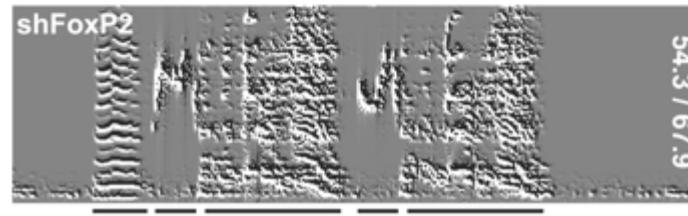
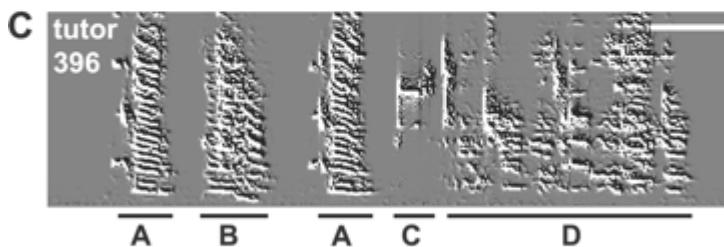
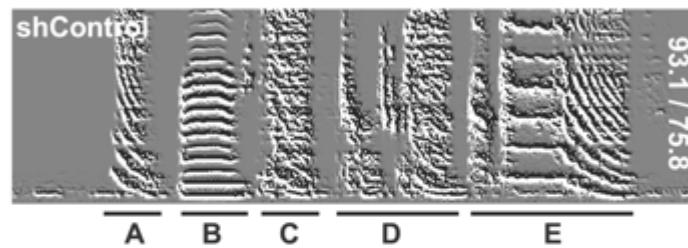
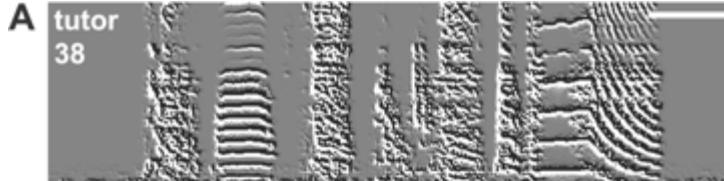
@pintofsciencebe

#CouchofScience20





FoxP2 loss in Zebra finch



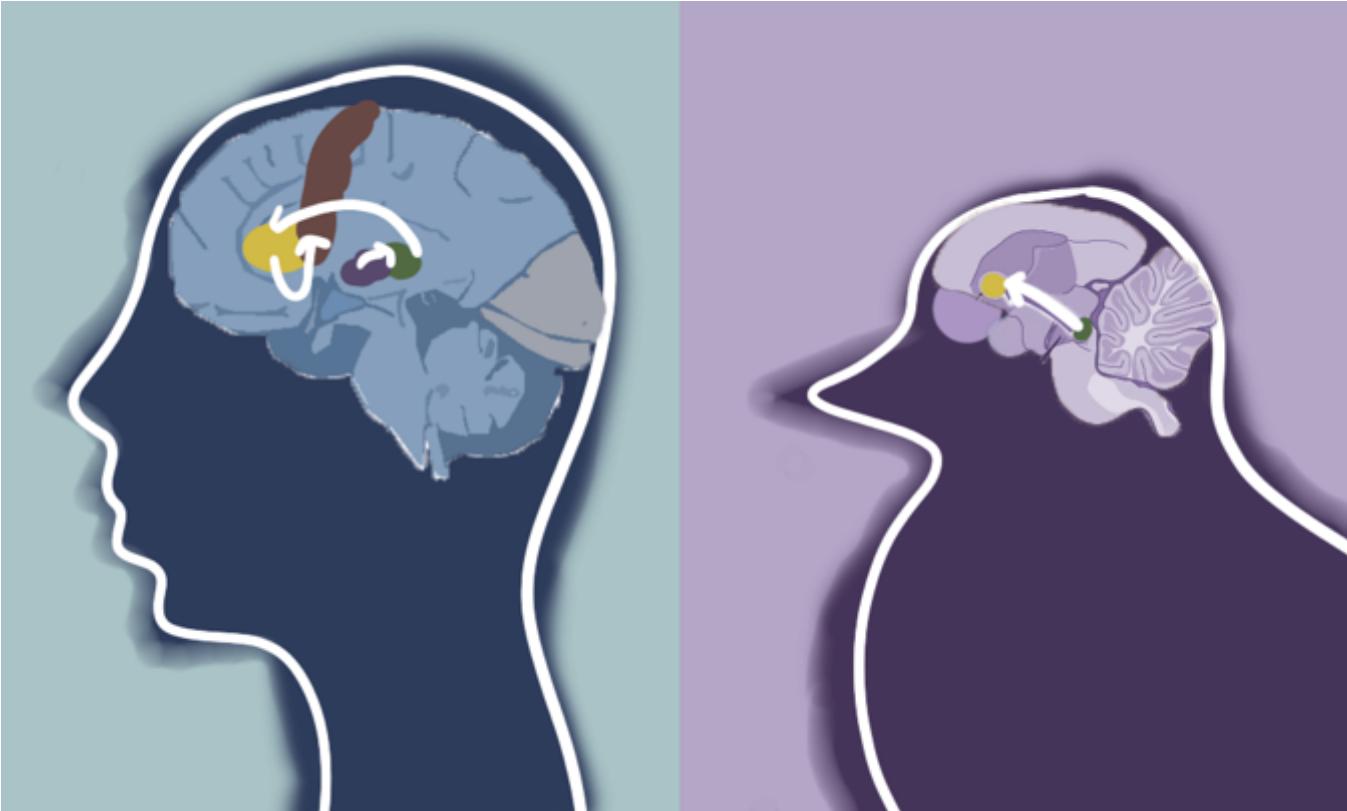
COUCH OF SCIENCE





Singing circuit is conserved

COUCH OF SCIENCE



@pintofsciencebe

#CouchofScience20





COUCH OF SCIENCE



Why study animals

1. Learn engineering solutions to real-life problems
2. Learn medical solutions for human diseases (Drug and Toxicology testing)
3. Window into human behavior



@pintofsciencebe

#CouchofScience20



“What is true for bacteria is true for elephants”
Jacques Monod, Nobel Prize in Medicine in 1965