**The Drosophila FoxP gene is necessary for operant self-learning: Implications for the evolutionary origins of language**

Björn Brembs¹, Diana Pauly², Rüdiger Schade³, Ezequiel Mendoza³, Hans-Joachim Pflüger⁴, Jürgen Rybak⁵, Constance Scharff⁶, Troy Zars⁷

¹ Institut für Biologie - Neurobiologie, Freie Universität Berlin; ² Robert Koch-Institut, Berlin; ³ Institut für Pharmakologie, Charité, Berlin; ⁴ Max Planck Institute for Chemical Ecology, Jena, Germany; ⁵ Division of Biological Sciences, University of Missouri, Columbia, Mo, USA

bjoern@brembs.net, http://brembs.net

---

**1. Abstract**

A fly orthologue of the transcription factor FoxP2 is expressed in the visual- and auditory-forebrain and is necessary for operant self-learning. Knockdown of the FoxP orthologue with an RNAi construct leads to reduced learning scores specifically in the self-learning task. The FoxP insertion 3955 in the FoxP gene did not lead to altered learning scores.

---

**2. The FoxP gene family tree**

---

**3. PKC activity is required specifically for self-learning**

---

**4. Insertion 3955 in the FoxP gene affects self-learning**

---

**5. The Drosophila FoxP gene locus**

---

**6. Drosophila FoxP is required for self-learning**

---

**7. FoxP protein expression**

---

**8. No obvious brain defects in FoxP3955 mutants**

---