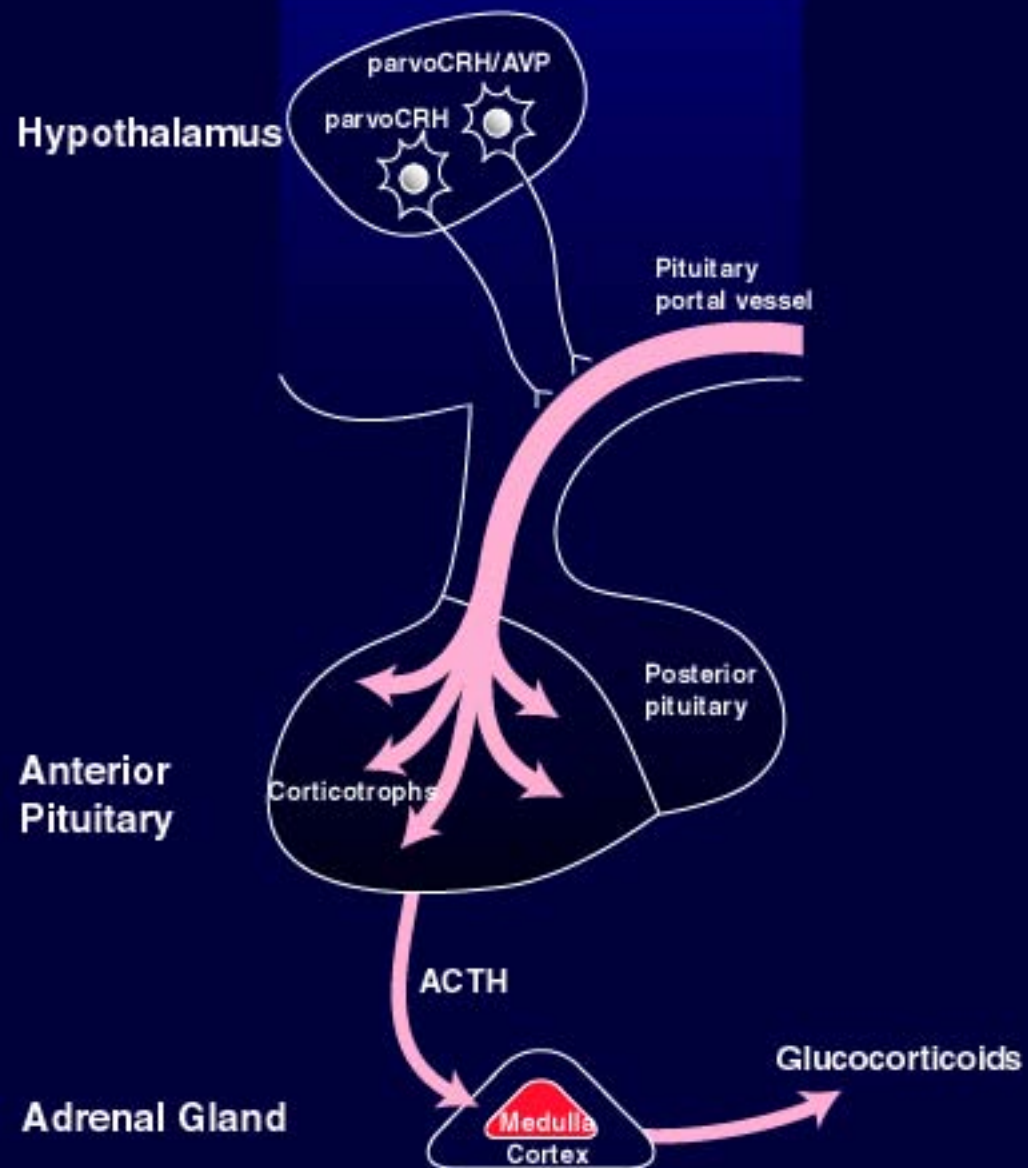


**Regulation of the adrenocorticotropin (ACTH)
response to arginine vasopressin (AVP):
Mechanisms of desensitization and resensitization**

**Ali Hassan & Drusilla Mason
Department of Zoology,
University of Canterbury.**

The hypothalamo-pituitary-adrenal axis



Desensitization

Desensitization : a reduction in response despite the presence of a stimulus of constant intensity

Desensitization of the ACTH response to AVP in perfused dispersed ovine anterior pituitary cells

- Dose-dependent : $IC_{50} = 6.54 \text{ nM}$
- Rapid : Complete within 10 min
- Readily reversible : Resensitization complete between 20 and 40 min

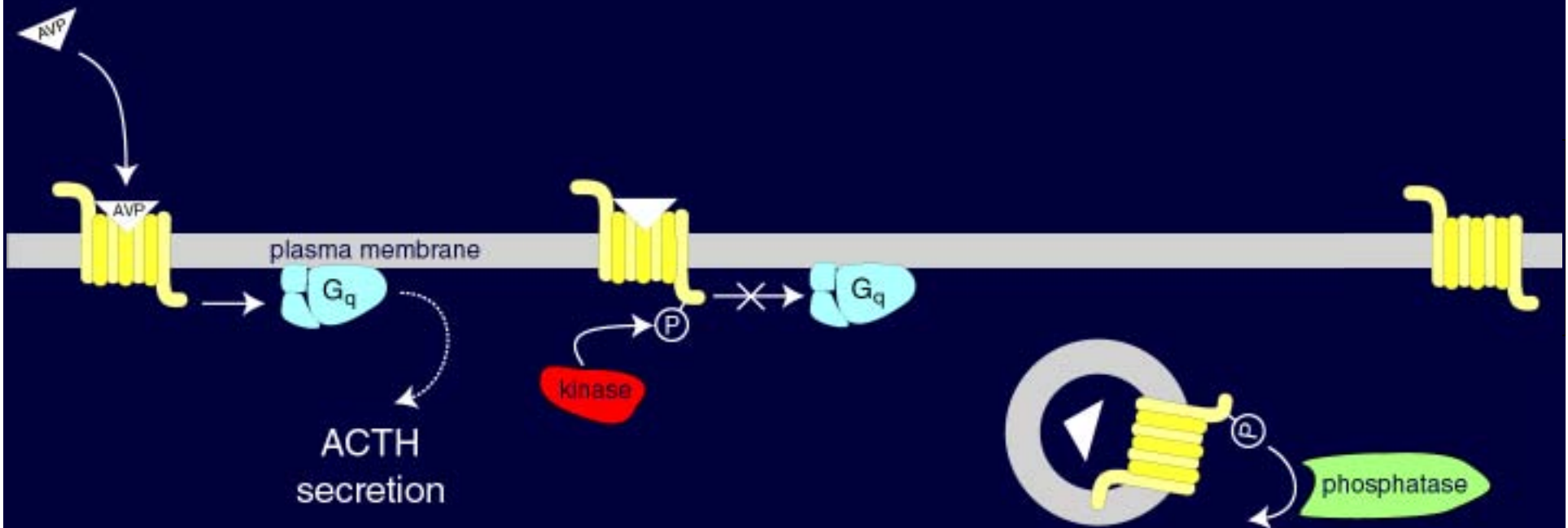
Mechanisms of rapid desensitization and resensitization

1. Signalling

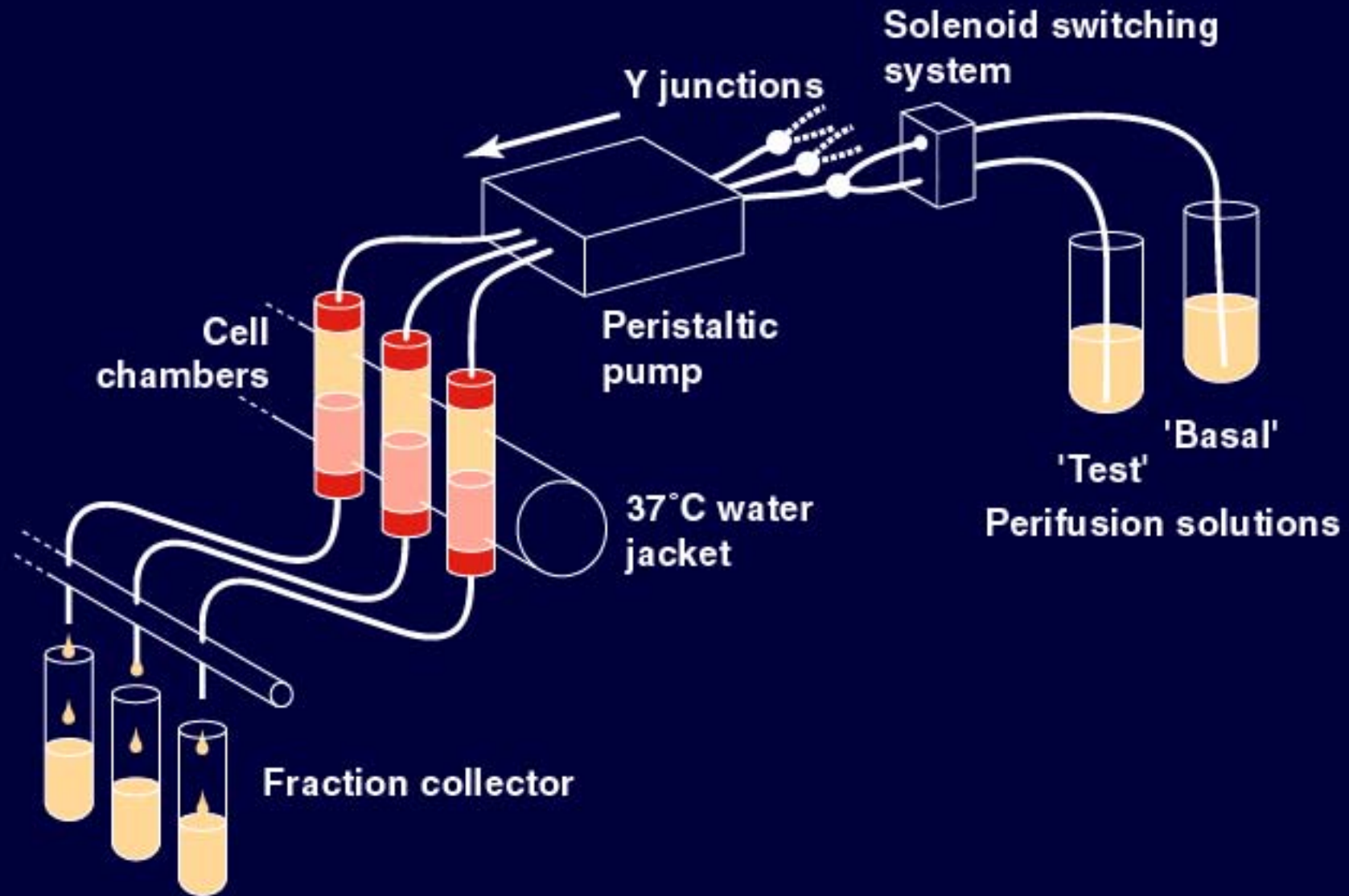
2. Desensitization

3. Internalization & Dephosphorylation

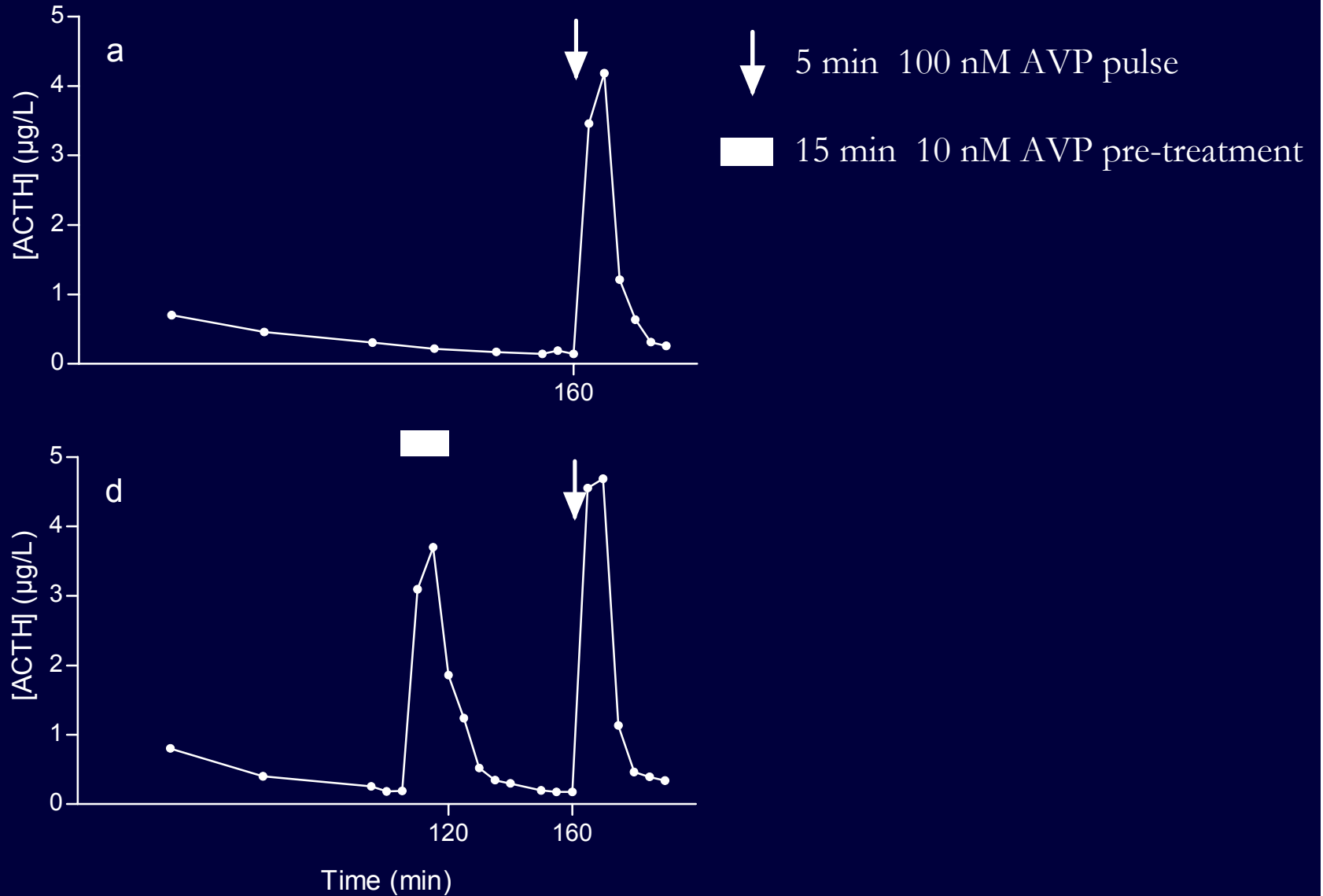
4. Recycling



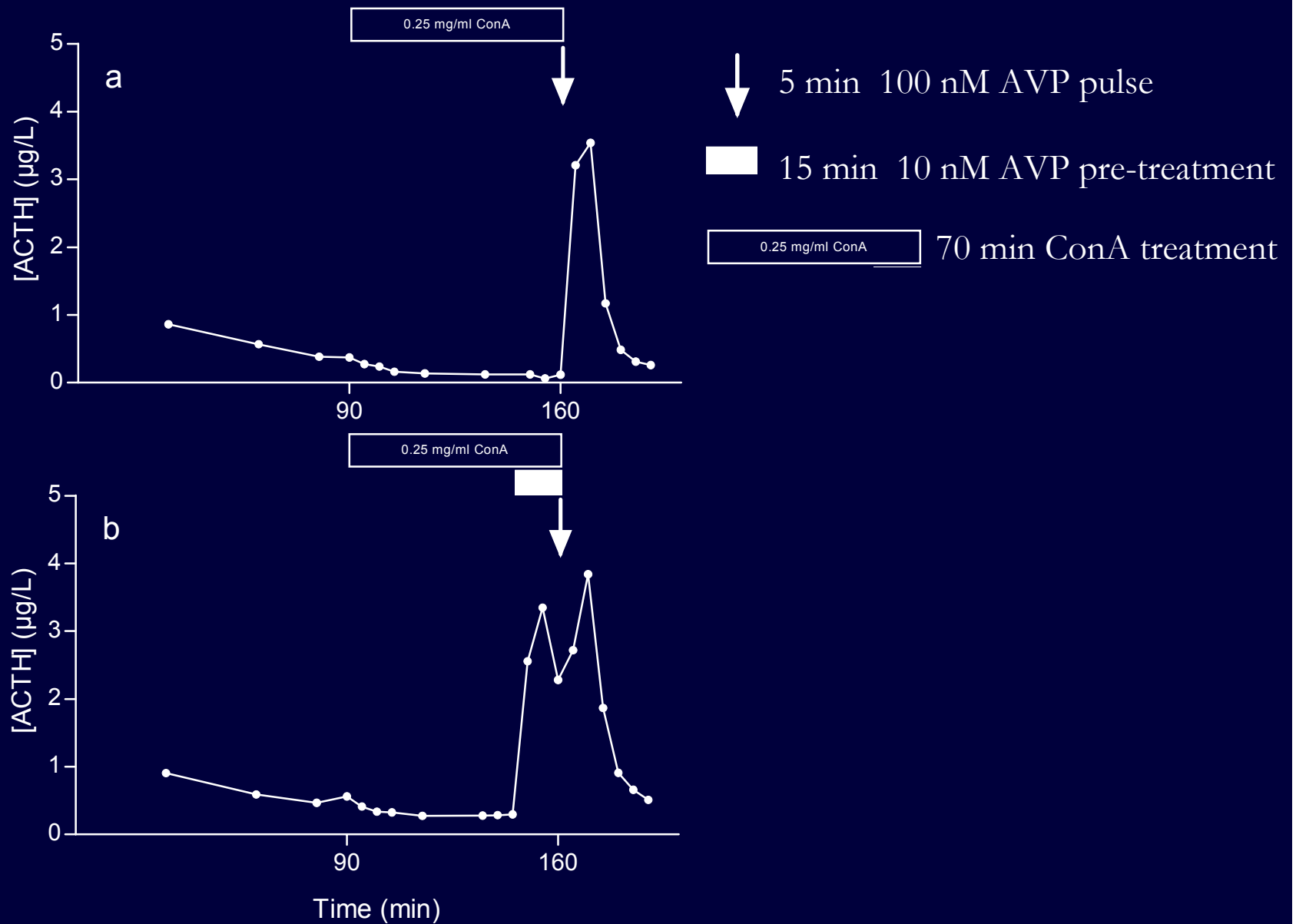
Multi-column perfusion system



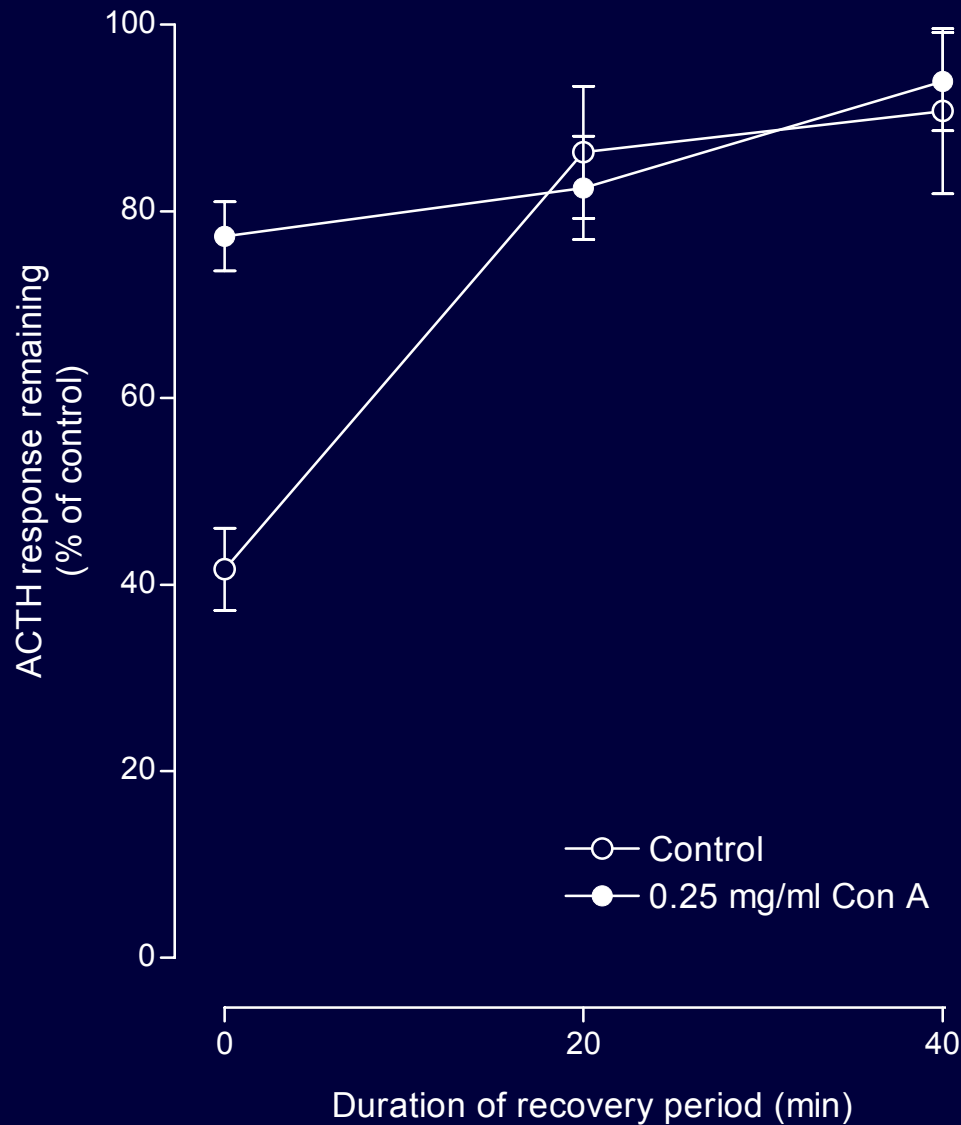
Experimental protocol (1)



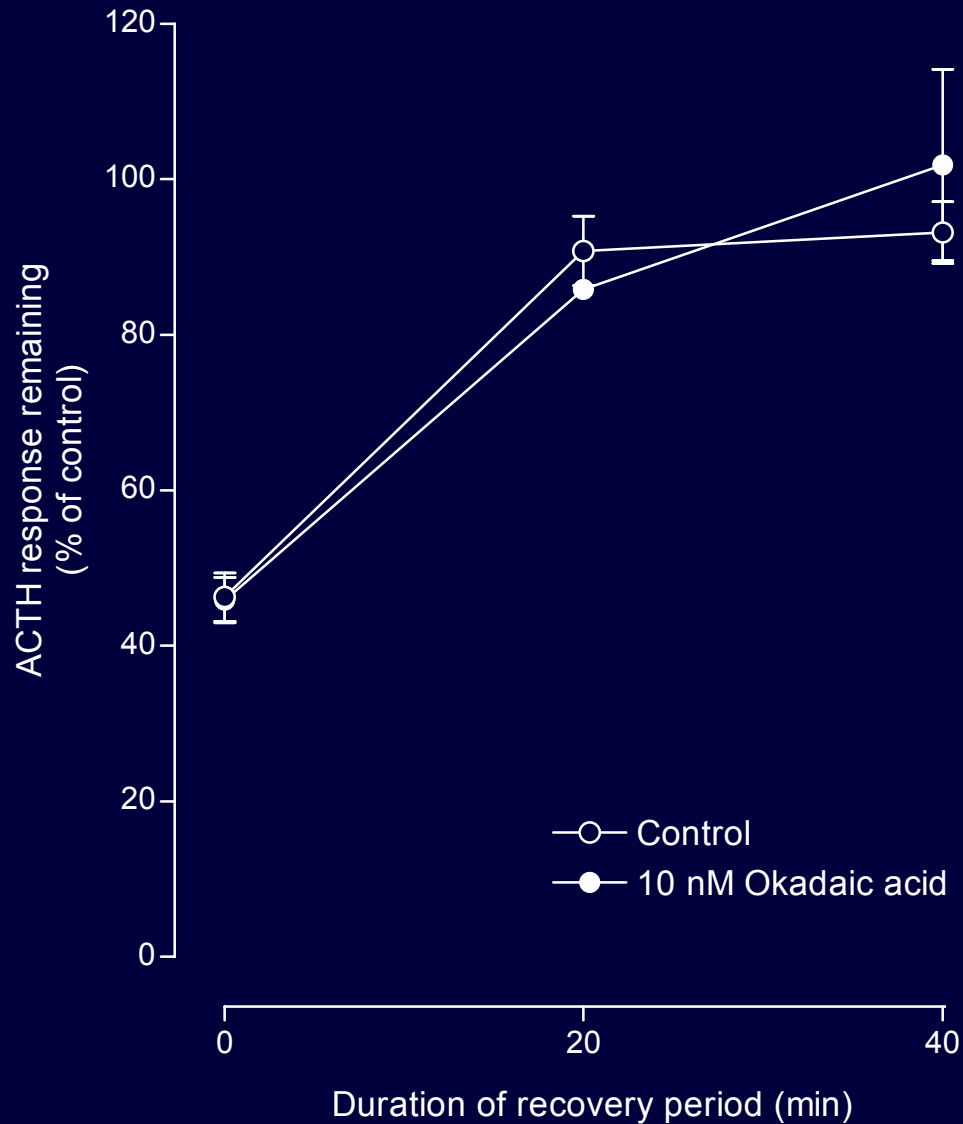
Experimental protocol (2)



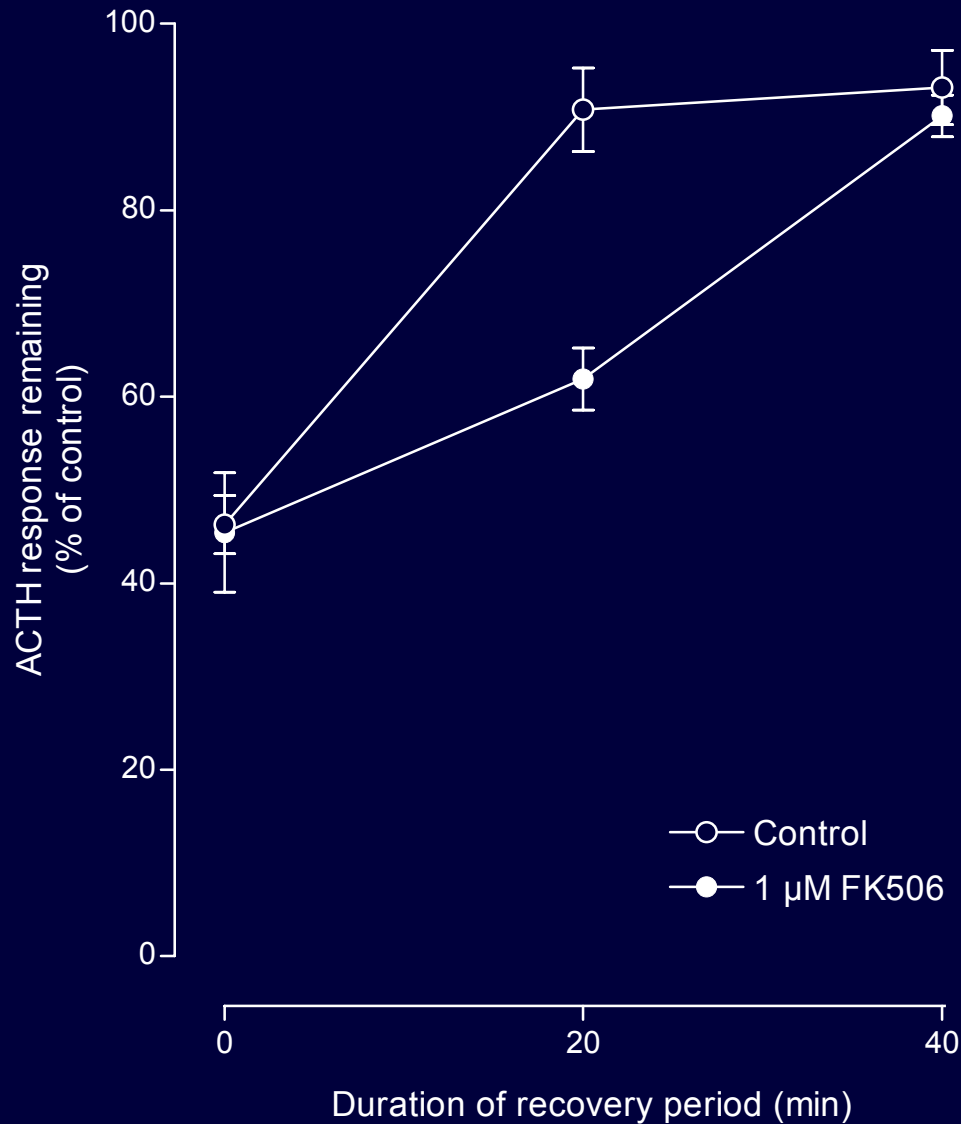
Effect of treatment with 0.25 mg/ml Concanavalin A on desensitization of the ACTH response to AVP



Effect of treatment with 10 nM okadaic acid on resensitization of the ACTH response to AVP

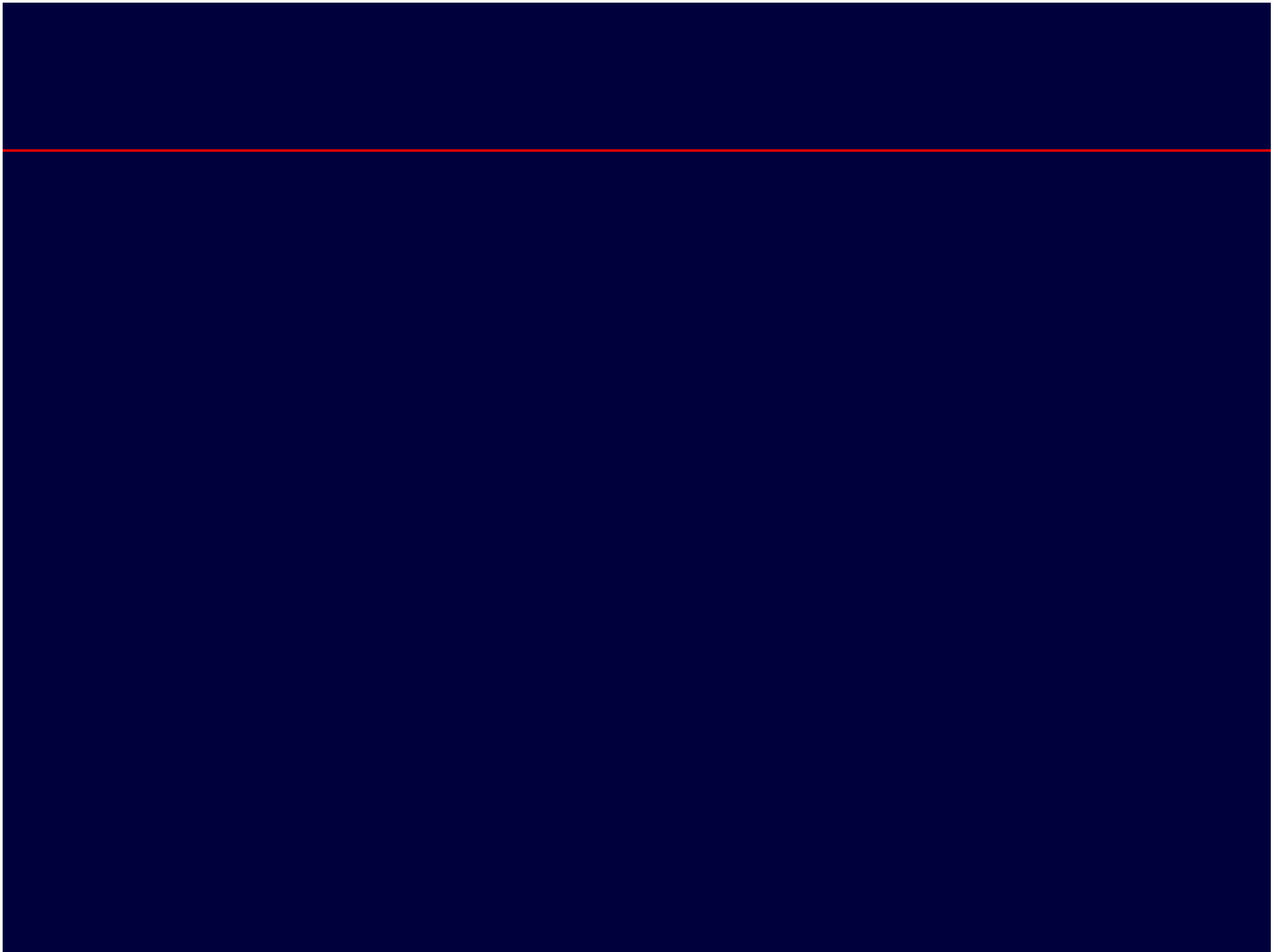


Effect of treatment with 1 μ M FK506 on resensitization of the ACTH response to AVP



Conclusions

- Receptor internalization plays an important role in the desensitization of the ACTH response to AVP
- Protein phosphatase 2B is involved in resensitization of the ACTH response to AVP



Effect of treatment with 0.4 M sucrose on desensitization of the ACTH response to AVP

