

## PROCEEDINGS OF THE NUTRITION SOCIETY

*The Three Hundred and Fifty-ninth Scientific Meeting was held at the Bristol Polytechnic, Coldharbour Lane, Frenchay, Bristol on 8 April 1981*

### **SYMPOSIUM AND WORKSHOP ON 'NEURAL PEPTIDES IN NUTRITION AND DEVELOPMENT'**

#### **The neurophysiology of feeding**

By E. T. ROLLS, *Oxford University, Department of Experimental Psychology, Oxford*

To investigate how different parts of the brain are involved in the control of feeding, one approach has been to make lesions. It has been found, for example, that lesions of the lateral hypothalamus produce a reduction in feeding and body-weight, and that lesions of the ventromedial hypothalamus lead to overeating and obesity. Problems with the lesion evidence are that damage to axons passing through these regions may account for some of the effects of the lesions and that the cell populations in the hypothalamus are heterogeneous.

More direct evidence on the neural control of feeding is now being obtained by recording the activity of single neurons during feeding, in a species relatively close to man, the rhesus monkey. It has been found that there is a population of neurons in the lateral hypothalamus with responses related to feeding (Rolls, 1981*a,b*; Rolls & Rolls, 1981). These neurons, which comprised 13% of those in one sample of 764 hypothalamic neurons, respond to the taste or to the sight of food or both, and only respond to food if the monkey is hungry. The responses of the neurons associated with the sight of food precede and predict the responses of the hungry monkey to food. This is evidence that these neurons are involved in mediating responses to food, which include autonomic, endocrine, and feeding responses. Evidence that these hypothalamic neurons are involved in controlling in particular feeding (as well probably as autonomic and endocrine responses made to the sight of food) is that a projection has now been demonstrated from hypothalamic feeding-related neurons to the cerebral cortex, using the technique of antidromic activation.

These findings firstly show how a population of hypothalamic neurons is involved in responses made to food, and secondly provide a basis for understanding how the neural effects of external stimuli produced by food are modulated by hunger to result in signals important in the control of feeding and body-weight. The modulating influences of hunger and satiety may be mediated in part by neuropeptides, either by direct actions in the hypothalamus, or indirectly.

## REFERENCES

- E. T. Rolls (1981a). *Br. Med. Bull.* **37**, 131.
- E. T. Rolls (1981b). In *Brain Mechanisms of Sensation* [Y. Katsuki, M. Sato and R. Norgren, editors]. New York: Academic Press.
- E. T. Rolls & B. J. Rolls (1981). In *Psychobiology of Human Food Selection* [L. M. Barker, editor]. Westport, Connecticut: AVI Publishing Co.

*Printed in Great Britain*