

second connector arm on the blood pressure transducer. Stimulate the chorda tympani nerve (4 V, 10 ms, 5-60 pps) until the pressure rise reaches its maximum and levels off. Stop the stimulation and detach the pressure transducer and needle from the salivary duct cannula. To demonstrate that the nerve is still functional stimulate the nerve with the same settings that produced a flow rate of 2.0 ml/min. Record the flow for 1 min.

Connect the femoral arterial cannula to the transducer and record arterial blood pressure. Compare the maximum saliva secretion pressure with the recorded systolic blood pressure. If two pressure transducers are available the blood pressure and salivary gland secretory pressures should be measured simultaneously.

#### *Salivary Secretory Response to Acetylcholine*

Without stimulation, record the volume of saliva (if any) produced in 1 min. Utilizing a 26-gauge needle inject 0.5 ml of the acetylcholine (0.02 mg/ml) solution into the carotid artery on the ipsilateral side of the salivary gland used. After 10 s, record the volume of saliva produced during the next minute. Compare the saliva secretory rates before and after acetylcholine injection.

#### *Effect of Atropine on Salivary Gland Secretion*

Next inject 1 ml of 0.1% atropine into the femoral vein and wait 10-15 min. Again, inject 0.5 ml of acetylcholine into the artery and record the saliva flow as noted above. Compare the saliva flow to acetylcholine stimulation before and after atropine. Now stimulate the chorda tympani nerve. What differences are noted in the volume and consistency of the saliva formed? What is the mechanism of action of atropine?

#### *Effect of Intravascular Saliva on Blood Pressure*

Inject the 2 ml of saliva that was collected earlier into the femoral vein of a dog and record the arterial blood pressure change. The change in blood pressure must result from a chemical substance in the saliva. What might this chemical substance be and what might be its mode of action?

## DISCUSSION AND RESULTS

This experiment is a modification of a time-honored laboratory exercise (3) for the physiology student. Shown in Table 1 are typical results obtained in our laboratory with dog saliva and

**TABLE 1. Osmotic Concentration and Electrolyte Composition of Saliva at Various Flow Rates**

Flow Rate, ml/min	Osmolarity, mosmol/l	Na <sup>+</sup> , meq/l	K <sup>+</sup> , meq/l	pH
0.2 (basal)	122	28	17.0	7.5
0.8	238	94	16.1	7.6
1.8	254	100	15.4	8.0
3.0	280	121	13.3	8.5
Plasma	293	134	2.9	7.35

plasma. The student should be asked to correlate the data he obtained with the current concept of salivary formation and flow (1,2).

We have found this laboratory exercise extremely beneficial for the undergraduate student, dental student, and nursing student. This exercise will help the student to accomplish the following objectives:

1. Demonstrates to the student the physiology of the salivary gland.
2. Gives an understanding of the parasympathetic control of the salivary gland.
3. Demonstrates the influence of varying salivary flow rates on [Na<sup>+</sup>], [K<sup>+</sup>], osmolarity, and pH.
4. Demonstrates that salivary secretion is an active process as can be denoted from salivary duct pressure exceeding systolic blood pressure.
5. Gives an understanding of the scientific method and investigation.

The individual experimental manipulations and questions can be easily modified to accomplish each teacher's own objectives for the laboratory exercise.

## REFERENCES

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3. Sherrington, C.S. *Mammalian Physiology a Course of Practical Exercises*. New York: Clarendon, 1919, p. 74-80.

## INTERNATIONAL BRAIN RESEARCH ORGANIZATION

### ANNUAL PRIZE IN THE NEUROSCIENCES

*The Drs C. & F. Demuth Swiss Medical Research Foundation* announces the creation of a yearly *International Award of SFr. 15,000 for young investigators in the Neurosciences*.

For 1982, applications are invited from Experimental Neuro-oncologists, particularly those interested in primary tumors of the central nervous system. Candidates from all nationalities, not older than 35 years, should submit (i) their curriculum vitae including a list of publications, (ii) a resume of current and projected work (a single-sentence heading followed by 2 or 3 typewritten pages), (iii) reprints of their 3 most important articles, and (iv) names and addresses of two referees acquainted with their work.

The jury consists of Professors G. Baumgartner (Zurich), J.J. Dreifuss (Geneva), A. Pletscher (Basle), and H. Van der Loos (Lausanne).

The 1982 award will be presented at the opening of the First World Congress of the International Brain Research Organization (IBRO) "The Brain in Health and Disease" (March 31-April 6, 1982) to be held in Lausanne, Switzerland.

Applications should be sent before December 15, 1981 to Professor H. Van der Loos, President of the Swiss Chapter of IBRO, Institute of Anatomy, University of Lausanne, Rue du Bugnon, 1011 Lausanne, Switzerland.