The inhibitory effect of myokinase on adrenaline induced platelet aggregation indicates that this aggregation is caused by an interference of adrenaline with the metabolism of ATP and ADP.

The disaggregating effect of myokinase supports the view that disaggregation is also an active metabolic process in which high energy phosphates play an important role.

The clinical meaning of this finding is that it shows the possibility of reduced platelet aggregability when myokinase is released, for instance from myocardial infarct. Released myokinase could enhance platelet disaggregation and thus reduce the danger of microthrombi formation.

Zusammenfassung. Myokinase, welche die Umwandlung von 2 Molekülen ADP in je 1 Molekül AMP und ATP katalysiert, hemmt die durch ADP sowie durch Adrenalin hervorgerufene Thrombozytenaggregation beträchtlich. Myokinase unterstützt die Desaggregation der durch Adrenalin aggregierten Thrombozyten. Diese Befunde weisen darauf hin, dass die makroergen Phosphate nicht nur für die Aggregation, sondern auch für die Desaggregation eine bedeutende Rolle spielen.

K. RYŠÁNEK, C. ŠVEHLA,
H. ŠPÁNKOVÁ and M. MLEJNKOVÁ

Research Institute of Experimental Therapy, Praha 4 (Czechoslovakia), 9 September 1968.

The Development of the Amylase Activity in Blood and its Behaviour in the Amniotic Fluid in Rats

It is well known that the amylase activity rate in blood, according to its behaviour in the duodenal juice, is slow in the new-born and reaches the normal adult level within the first 2 years of life[1-4]. Employing our own micromethod we examined this course of development in Wistar rats during the first half year of life. To determine amylase activity, 0.02 ml of capillary blood (or amniotic fluid) were suspended in 0.5 ml of 0.9% NaCl-solution, centrifuged, and the supernatant dilution examined in the same way as described for human serum[5].

The results are shown in the Figure. The ferment activity rate is expressed in terms of g% amylase activity (= hydrolysis of 1 g of starch in a 0.12% solution at pH 6.8 and 37 °C within 30 min by 100 ml of blood).

The examination of the amylase activity rate in blood and in the amniotic fluid of the rat foetuses as well as in the blood of the respective pregnant animals yielded the values compiled in the Table.

Amylase activity is observed in the blood of rat foetuses weighing 1 g and more. The mean values increase from birth up until about the twelfth day of life, reaching the normal adult level.

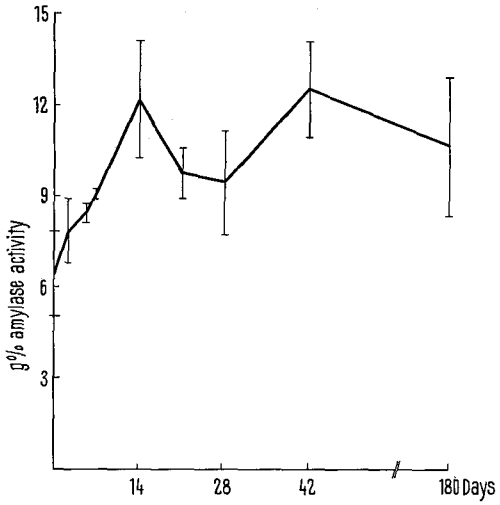
It must be noted that this increase coincides with the period during which the animals ingest exclusively by lactation. Thus, contrary to the assumption with regard to humans[6], it is not necessary to expose the organism to the physiological substrate of the amylase (starch) for the full development of this ferment.

No amylase activity is observed in the amniotic fluid during the early period of foetal development either. Above a foetal weight of 0.9 g the amylase activity rate increases rapidly to values which can amount to about the 20-fold of those of the foetal blood, or the 5-fold of the mother's blood. The amylase activity rate drops considerably at the end of the gravidity with the decrease of the amount of amniotic fluid.

1 W. PERNICE, Z. Kinderheilk. *58*, 86 (1937).
2 D. H. ANDERSEN, Am. J. Dis. Child. *63*, 643 (1942).
3 S. AURICCHIO, D. D. PIETRA and A. VEGNENTE, Pediatrics *39*, 853 (1967).
4 G. AHLERT, E. HOFER and I. AHLERT, Dt. Ges.-Wesen *23*, 1599 (1968).
5 H. STOBBE, E. EGGER, G. AHLERT and H. HERRMANN, Dt. Ges.-Wesen *21*, 1221 (1966).
6 G. FANCONI and A. WALLGREN, *Lehrbuch der Pädiatrie*, 7th edn (Schwabe & Co., Basel/Stuttgart 1963), p. 195.

Amylase activity of the amniotic fluid and in the blood of foetuses and the respective pregnant rats

Weight of foetus (g)	Amniotic fluid				Blood of foetus			Pregnant rat
	No.	Vol. (ml)	Amylase activity $\bar{x}$ (g%)	range (g%)	Amylase activity No.	$\bar{x}$ (g%)	range (g%)	Amylase activity (g%)
0.166	9	~0.2	0	–	–	–	–	11.3
0.320	6	~0.2	0	–	4	0	–	16.3
0.5	2	~0.2	0	–	–	–	–	15.3
0.9	8	~0.3	0	–	8	0	–	22.5
0.9	2	~0.3	2.5	(2.5–2.5)	–	–	–	12.8
1.9	2	~0.5	24.1	(23.7–24.4)	5	4.3	(3.4–6.0)	12.2
2.9	4	~0.5	54.3	(46.0–62.7)	6	6.5	(5.1–7.5)	20.0
4.0	3	< 0.1	17.7	(14.4–19.6)	3	6.7	(6.5–7.0)	21.3
4.5	3	~0.5	91.5	(72.0–114.1)	3	4.7	(2.4–6.3)	22.3
4.5	4	< 0.1	13.9	(10.8–16.1)	6	4.8	(4.1–5.6)	13.7
5.0	2	< 0.1	16.8	(14.4–18.6)	2	5.6	(4.4–7.0)	22.2
New-born 5.0	–	–	–	–	33	6.4	(4.4–9.3)	–



Amylase activity in the blood of Wistar rats in the first half year of life.

In our opinion this behaviour seems to indicate that the primary origin of the amylase occurring in the amniotic fluid is the urine excreted by the foetus.

Just as in the case of humans[7], the mean amylase activity rate in the blood of the rat is somewhat higher during gravidity.

Zusammenfassung. Die Amylaseaktivität im Blut von Wistarratten steigt bis zum Ende der Säugeperiode an. In der Amnionflüssigkeit fehlt sie zunächst, nimmt oberhalb eines Fötalgewichtes von 2 g auf ein Vielfaches der Blutwerte zu und fällt mit schwindender Amnionflüssigkeit am Ende der Gravidität stark ab.

G. Ahlert, M. Böhm and G. Brüschke

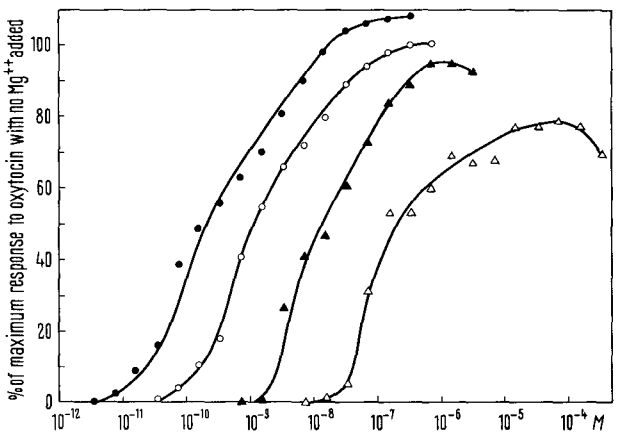
I. Medizinische Universitätsklinik of the Charité, 104 Berlin (DDR), 29 July 1968.

[7] R. L. Burt and J. A. McAlister, Obstet. Gynec., N.Y. *28*, 351 (1966).

Comparison of the Mode of Action of Oxytocin and Lysine-Vasopressin on the Isolated Rat Uterus

The primary structures of 7 natural neurohypophyseal octapeptides, isolated from a broad spectrum of vertebrate species, have been elucidated[1–4]. Point mutations in the genetic code(s) for the ancestral octapeptide molecule(s) resulted in alterations of the primary peptide sequence. Available evidence to date indicates that only substitutions in positions 3, 4 and 8 have been favored during the course of evolution. In this context it was desirable to explore whether, in addition to quantitative biological differences (affinity for a given target organ), also qualitative differences (ability to induce a response subsequent to receptor occupation) played a role in adaptation.

Hormones of the posterior pituitary gland possessing neutral alkyl amino acid residues in positions 3 and 8 (e.g., isoleucyl and leucyl, respectively, in the case of oxytocin) are potent contractile stimulants of the in vitro rat uterus; hormones, e.g. [lysine]-vasopressin, possessing in position 3 an aromatic amino acid residue (phenylalanyl) and in position 8 a basic alkyl amino acid residue (lysyl) exhibit low potencies in this bioassay. Usually the potencies of these hormones are determined by a 4-point design[5] in magnesium-free van Dyke-Hastings solution[6] and are expressed in terms of specific activities. To gain a deeper understanding of the mode of interaction of these hormones with the uterine receptor(s) we determined the cumulative dose-response curves[7] of [lysine]-vasopressin and oxytocin in magnesium-free solution (Figure, curves Ia and IIa). It is apparent from this study that these 2 neurohypophyseal hormones differ not only in their affinities (oxytocin, pD_2 9.17 $\pm$ 0.08[8]; [lysine]-vasopressin, pD_2 6.82 $\pm$ 0.12) for the smooth muscle receptor but, more significantly, in their maximum effects – a measure of intrinsic activity (oxytocin, α 1.00; [lysine]-vasopressin, α 0.83 $\pm$ 0.04). That the diminished intrinsic activity of [lysine]-vasopressin is associated with the presence of the phenylalanyl residue in position 3, and not with the presence of the lysyl residue in position 8, is suggested by recent findings[8] in this laboratory: dose-response studies with oxytocin analogs, which differ specifically in the substitution of the aliphatic isoleucyl residue in position 3 by the aromatic phenylalanyl residue (3-isoleucine-8-alanine-oxytocin *v.* 3-phenylalanine-8-alanine-oxytocin), showed that the side-chain in position 3 not only actively contributes to bind-



Cumulative dose-response curves of [lysine]-vasopressin and oxytocin on the in vitro rat uterus mounted in Munsick's fluid without added magnesium and with 0.5 m*M* added magnesium. Oxytocin without added magnesium (○——○) (Ia); oxytocin with added magnesium (●——●) (Ib); [lysine]-vasopressin without added magnesium (△——△) (IIa); [lysine]-vasopressin with added magnesium (▲——▲) (IIb). The experimental procedure followed for obtaining dose-response curves has been detailed in [8]. Each curve represents an average of at least 10 experiments with 6 different rats.