

animals. The major difference lies in the larger maintenance requirements of the mouse due to its higher metabolic rate.

Philip Jacobson

110563j Levels of immunoglobulins (γ G, γ M, γ A) in normal children. Tanaka, Kihachiro (Kyoto Univ., Kyoto, Japan). *Monika Kyo* 1968, 11-6, 379-86 (Eng). Levels of serum immunoglobulins were determined by the antibody agar plate method in maternal and cord blood at the time of delivery and in groups of normal infants and children up to age 15. γ A was absent from cord blood, γ M present only in traces, whereas the levels of γ G in cord blood were equal to or above those in maternal blood. Minimum levels of γ C were found at 3 and 6 months, then rose slowly, not attaining the adult range until age 11. Levels of γ M reached half the range found in adults by 3 months, but did not reach adult levels until 3 yrs. Levels of γ A were less than half the adult range up to age 5, then rose rapidly. Jacob Sacks

110564k Polymorphism of transferrins of bovine, porcine, and canine sera, as determined by means of acrylamide-gel disc electrophoresis. Dorner, Joseph L. (Univ. of Illinois, Urbana, Ill.). 1968, 66 pp. (Eng). Avail. Univ. Microfilms, Ann Arbor, Mich., Order No. 89-10,687. From *Diss. Abstr. B* 1969, 29(12), 4727.

110565m Hemoglobin-Lepore Baltimore, a third type of a β crossover (β^L , β^M). Ostertag, Wolfram; Smith, Ernest Wendell (Sch. of Med., Johns Hopkins Univ., Baltimore, Md.). *Eur. J. Biochem.* 1969, 10(2), 371-6 (Eng). A new Lepore-type Hb in a person of Negro descent has been identified. In this person a minor Hb (Hb-Lepore_{Baltimore}) was detected. An abnormal β -chain was isolated and fingerprinted. This hybrid-type protein presumably arose as a consequence of unequal crossing over between the δ and β genes, as was concluded for Hb-Lepore_{Seattle} and Hb-Lepore_{Atlanta}. In the new Lepore-type Hb described here the crossover could be placed between residues β^{28} and β^{29} . This type of crossover should occur with the highest frequency if crossing over is equally frequent between any nucleotides and if selection favors none of the crossover types. RCBV

110566n Genetic and developmental regulation of hepatic δ -aminolevulinic acid dehydratase in mice. Doyle, Darrell J.; Schimke, Robert T. (Sch. of Med., Stanford Univ., Stanford, Calif.). *J. Biol. Chem.* 1969, 244(20), 5449-59 (Eng). The mechanism by which the levulinate locus (Ls) regulates the tissue activity of δ -aminolevulinic acid dehydratase in mice has been examined. The assayable hepatic enzyme activity in homozygous Ls^+ mouse strains, represented by C57Bl/6, is between one-third and one-half that of homozygous Ls^- strains. This difference in enzyme activity is due to a difference in amt. of enzyme protein as demonstrated by immunochem. techniques with an antibody specific for δ -aminolevulinic acid dehydratase. Combined immunochem. and isotopic techniques show that the levulinate locus regulates the concn. of hepatic δ -aminolevulinic acid dehydratase by acting at the level of enzyme synthesis. The rate of degradation of hepatic enzyme is the same in both low and high activity strains; when expressed as a half-life, this is equal to 5-6 days. The pattern of δ -aminolevulinic acid dehydratase development with age is similar in livers of both low and high activity strains. The specific activity of the enzyme is high in fetal liver, decreases during the several days prior to birth, and increases to the adult level during the first 3 weeks of postnatal life. The activity of δ -aminolevulinic acid dehydratase in fetal liver is also regulated by the levulinate locus. The enzyme in fetal liver is approx. twice as active catalytically as the enzyme in adult liver relative to its function as an antigen. The fetal enzyme also appears to be different in stability to heat and proteolytic inactivation. However, fetal and adult enzymes are similar by other physicochem. criteria, including electrophoretic mobility, sedimentation coeff., and K_m for the substrate. RCJN

110567p Identification and genetic control of two new low-density lipoprotein allotypes: phenogroups at the Lp locus. Albers, John J.; Dray, Sheldon (Med. Center, Univ. of Illinois, Chicago, Ill.). *J. Immunol.* 1969, 103(2), 155-62 (Eng). See *CA* 69: 104403x. VNJZ

110568q Modification by crude histones of gene activity for lactate dehydrogenase. Latner, A. L.; Longstaff, E. (Roy. Victoria Infirmary, Newcastle upon Tyne, Engl.). *Nature (London)* 1969, 224(5214), 71-3 (Eng). Addn. of crude calf thymus histone to the mouse kidney organ culture increased the proportion of the lactate dehydrogenase (LDH) isozymes which moved more rapidly toward the anode during electrophoresis. A crude rat liver histone fraction was added to the culture, the increase was in the direction of the slower moving LDH isozymes. In the cultures exposed to the crude calf thymus histone, the percent of LDH-1 and the H subunit contribution to the total LDH activity significantly increased, whereas the opposite was found with the rat liver histone prep.: LDH-5 and the M subunit significantly increased. Enrichment of the medium with amino acids present in the calf thymus histone prep. did not alter the isozyme pattern, indicating that the changes in LDH pattern were not caused by hydrolysis of the histone. Gene masking by histones apparently is nonspecific, and the crude ext.

may contain factors, not necessarily histones, which affect gene activity in a manner that is not species specific. BSJN

110569r Changes in the activity of isolated vascular smooth muscle in response to reduced osmolality. Jonsson, Olof (Univ. Goteborg, Goteborg, Sweden). *Acta Physiol. Scand.* 1969, 77(1), 191-200 (Eng). The effects of hypotonicity on the spontaneous activity of the smooth muscle in the isolated portal vein of the rat have been studied in solns. with varied ionic compn. A comparison between the stimulatory effects of lowered osmolality and increased $[K^+]_o$ (external K^+ concn.) indicated that at normal $[K^+]_o$ in the control state the excitation caused by hypotonicity is not mediated only via changes in the $[K^+]_o/[K^+]_i$ ratio. The response to hyposmolality at a higher $[K^+]_o$ is, however, more readily explained by the change in $[K^+]_o/[K^+]_i$ which occurs in assocn. with the swelling of the cells. This might be attributed to the fact that the membrane potential of smooth muscle is more dependent on the transmembrane concn. gradient for K^+ at higher levels of $[K^+]_o$. The stimulatory effects of hyposmolality are markedly reduced at a low $[Na^+]_o$ but are not considerably affected by comparable redns. in $[K^+]_o$ or $[Cl^-]_o$. This indicates that the transmembrane Na^+ gradient is involved in the mechanisms by which hyposmolality excites the spontaneous activity of vascular smooth muscle. One possible interpretation is that the swelling of the muscle cells in hypotonic solns. causes an increase in the permeability of the cell membrane to the relatively larger Na^+ . RCVV

110570j Secretion of rat pancreas perfused with plasma from rats fed soybean trypsin inhibitor. Khayambashi, H.; Lyman, R. L. (Univ. of California, Berkeley, Calif.). *Amer. J. Physiol.* 1969, 217(3), 646-51 (Eng). When plasma from rats fed soybean trypsin inhibitor was perfused through an isolated, fasted rat pancreas, amylase secretion was 2-3-fold greater than that of a pancreas perfused with plasma from rats fed the same diet without trypsin inhibitor. Addn. of atropine to the perfusate did not inhibit the secretory response. The plasma factor was relatively unstable upon storage at 4° (50% loss of activity in 4 days) and appeared to be assocd. mainly with those plasma proteins of 10,000 mol. wt. or less. Thus, active soybean trypsin inhibitor enhanced the formation and (or) release of a humoral pancreozymin-like substance that markedly stimulated external enzyme secretion of the rat pancreas. RCDH

110571k Effects of diet and catechol amines on bile acid metabolism in dogs. Gans, Joseph H.; Cater, Marilyn R. (Coll. of Med., Univ. of Vermont, Burlington, Vt.). *Amer. J. Physiol.* 1969, 217(4), 1018-24 (Eng). Five adult male dogs were surgically prepd. with polyvinyl tubing placed in the upper duodenum. Each dog was given cholic-carboxyl- ^{14}C acid and samples of gallbladder bile were withdrawn over a 10-day period. The taurocholic acid pool was 1.09 g./10 g. body wt. and half-life was 3.2 days when dogs were given a dry dog food diet. Epinephrine in oil, 0.8-1 mg./kg./day, increased plasma cholesterol concns., produced a 23.9% redn. in the taurocholic acid pool size, and increased the rate of decline of specific radioactivity of both taurocholic and taurodeoxycholic acids. The half-life of taurocholic- ^{14}C acid during epinephrine administration was 1.6 days. Norepinephrine in oil, 0.8-1.0 mg. free base/kg./day, produced a modest decrease in the half-life of taurocholic- ^{14}C acid without significant elevations in plasma cholesterol concns. A dietary supplement of $1/4$ lb. beef plus 2-3 g. of cholesterol per day resulted in increased plasma cholesterol concns., increases in the taurocholic acid pool size, and a decrease in the half-life of taurocholic- ^{14}C acid. Epinephrine administration further increased plasma cholesterol concns. in cholesterol-fed dogs, but did not significantly alter bile acid metabolism. RCDH

110572m Effect of osmolality on canine renal vascular resistance. Gazitua, Sergio; Scott, Jerry Benjamin; Chou, Ching-Chung; Haddy, Francis J. (Michigan State Univ., East Lansing, Mich.). *Amer. J. Physiol.* 1969, 217(4), 1216-23 (Eng). The effects of changes in renal blood osmolality, produced by close intraarterial infusion of solns. of dextrose, NaCl, and urea, on renal resistance were systematically examd. in the dog. Infusion of a hyperosmotic soln. of dextrose for 3 min. produced a fall in renal vascular resistance which was sustained for the entire infusion period. On termination of the infusion, resistance returned to the control level. Infusion of a soln. of hyperosmotic NaCl or urea, on the other hand, produced a fall in resistance which waned with time. Furthermore, on stopping the infusion, resistance transiently rose well above the control level, particularly in the case of urea. Intraarterial infusion of an isosmotic soln. of urea and of hyposmotic solns. of all three substances produced large increases in resistance. Studies concerning lymphatic vessel pressure and cell-free perfusion, as well as the findings of others, are consistent with the hypothesis that the changes in resistance result to a large extent, from active vasomotion, possibly due to osmotic changes in the water content of the smooth muscle cells. RCDH

110573a Metabolism of allyl compounds in the rat. Chapp, J. J.; Kaye, C. M.; Young, Leslie (St. Thomas's Hosp. Med. Sch., London, Engl.). *Biochem. J.* 1969, 114(1), 61-71 (Eng). A mercapturic acid was isolated from the urine of rats treated s.c.



with CH_3CHIOAc or CH_3CHIOH and identified as 3-hydroxypropylmercapturic acid (*N*-acetyl-S-(3-hydroxypropyl)-L-cysteine, I). There was no evidence for the presence of allylmercapturic acid (*N*-acetyl-S-allyl-L-cysteine, II) in the urine of these animals. II, however, was detected in the urine of rats injected s.c. with CH_3CHCl , S-allylglutathione, and S-allyl-L-cysteine. Rats treated with CH_3CHCl also excreted I. Mercapturic acids apparently arise by the reaction of allyl compds. or their active derivs. with glutathione.

BQJN

110574p Metabolites of octoclotheptine eliminated in human and rat urine. Quisnerova, Milena; Svatek, E.; Metysova, Jirina (Res. Inst. Pharm. Biochem., Prague, Czech.). *Biochem. J.* 1969, 114(2), 339-42 (Eng). Four metabolites and unchanged octoclotheptine were extd. with dichloroethane from the urine of humans given octoclotheptine. These substances were isolated and purified by column and thin-layer chromatog. By chromatographic, spectrophotometric, and polarographic anal., unchanged octoclotheptine and 3 of the metabolites were identified (noroctoclotheptine, noroctoclotheptine S-oxide, and octoclotheptine S-oxide). The presence of glucuronides in human urine was shown. The same metabolites and unchanged octoclotheptine were also found in rat urine by chromatog.

RCFG

110575a Mechanism by which leucine and arginine stimulate insulin release in vitro. Milner, R. D. G. (Univ. West Indies, Kingston, Jamaica). *Biochim. Biophys. Acta* 1969, 192(1), 154-6 (Eng). Basal insulin release in young rabbit pancreas slices in vitro was higher in the presence of leucine (5mM) than of arginine (5mM) (in the absence of glucose). Glucagon (5 $\mu\text{g./ml.}$), theophylline (1mM), dibutyryl cyclic AMP (1mM), or L-arginine (5mM) stimulated insulin release in the presence of leucine but not in the presence of arginine. Arginine-stimulated basal insulin release perhaps works by releasing glucagon from the α -cells. The mechanism of the leucine-induced stimulation is different, probably via the adenylyl cyclase system.

BSJN

110576a Cytochemical study of the distribution and content of nucleoproteins and of some functional groups of proteins in isolated formations of the central nervous system following foreign protein injection. Tumanyan, E. L. (Erevan. Med. Inst., Erevan, USSR). *Biol. Zh. Arm.* 1969, 22(5), 97-8 (Russ). Cytoplasm of various parts of rabbit central nervous system (including intervertebral ganglia, nuclei of the XII cranial nerve, and skin motor area of brain cortex) displayed higher ribonucleoprotein content in animals treated with repeated i.v. injection of normal horse serum. The peak effect was observed on the 4th day after the last injection. N⁺ changes were seen in content and distribution of protein SH groups.

N. Jasinczak

110577a DNA synthesis in mouse embryonic fibroblast-like cells in vitro, stimulated by various factors. Vasil'ev, Yu. M.; Gel'fand, I. M.; Gel'shtein, V. I.; Fetisova, E. K. (Mosk. Gos. Univ., Moscow, USSR). *Dokl. Akad. Nauk SSSR* 1969, 187(4), 913-15 [Cytol] (Russ). Autoradiography was used to follow the DNA synthesis in single-layer cultures of mouse embryo fibroblast-like cells in lactalbumin hydrolyzate and ox serum media in the presence of thymidine-³H added at various periods of culture age. The index of ³H inclusion was increased by addn. of testicular or bacterial hyaluronidases, RNase, and digitonin. The rise of ³H intake was the result of stimulation of the entry of the cells into the S-phase of development.

G. M. Kosolapoff

110578t Effect of pregnancy and oral contraceptives on glucose and insulin metabolism. Taskinen, Marja R. *Duodecim* 1969, 85(11), 676-83 (Finnish). A review. The effect of both pregnancy and oral contraceptives is diabetogenic, and they may cause deterioration of glucose tolerance in healthy women. The organism tends to compensate this by enhanced insulin secretion, which leads to hyperinsulinism. 43 references.

I. G. Zwi

110579a Effect of pyridoxal 5'-phosphate on the strength of skin in vitro. Harkness, Robert D. (Univ. Coll. London, London, Engl.). *Experientia* 1969, 25(10), 1048-9 (Eng). Treatment with 10mM pyridoxal 5'-phosphate (I) in vitro reduced the strength of rat tail skin progressively with time of incubation. The redn. was reversible, with strength returning when the skin rings were placed in buffered saline. Pyridoxamine or pyridoxine at 10mM had no comparable effect. The effect of I was reduced in the presence of lysine. Pretreatment of the skin with NaBH_4 , followed by washing in saline buffer, largely inhibited the effect of I. Pretreatment with NH_4OH also inhibited the effect of I. Treatment with NH_4OH after I prevented the recovery of strength on subsequent transfer to the saline buffer; H_2NNH_2 had a similar effect. The effect of I on skin strength is apparently brought about by rupture of an amine linkages formed between an aldehyde and an amino group.

BSJN

110580a Diabetogenic effect of L-asparaginase. Khan, Amanullah; Adachi, Mitsuo; Hill, Joseph MacGlashan (Wadley Inst. of Mol. Med., Dallas, Tex.). *J. Clin. Endocrinol. Metab.* 1969, 29(10), 1373-6 (Eng). The effects of *Escherichia coli* L-asparaginase (500-50,000 I.U./kg. i.v.), which has been used to induce remission of human acute lymphatic and myelogenous leukemias via depletion of an amino acid essential for some neoplastic cells, on rabbit blood and urinary glucose levels were

studied. A dose of 2000 I.U. L-asparaginase/kg. evoked hyperglycemia and glycosuria in most of the animals; this is equal to a dose which induced hyperglycemia when given to patients. AF rabbits receiving 10,000 I.U. L-asparaginase/kg. or more showed diabetogenic responses, but these effects were temporary (2-11 days) and were not assoc. with any histological changes in the pancreatic islets, except in 1 rabbit which showed islet hyalinization.

DDJN

110581p Effect of Bidrin on the metabolism of dietary components by the bovine. Lowrey, R. S.; Bowman, Malcolm C.; Knox, F. E. (Coastal Plain Exp. Sta., Agr. Res. Serv., Tifton, Ga.). *J. Dairy Sci.* 1969, 52(9), 1460-3 (Eng). Six steers averaging 400 kg. in wt. were used in a switchback trial to study the effect of spiking corn silage with 15.7 ppm. (0.24 mg./kg. body wt.) of the pesticide Bidrin [3-(dimethoxyphosphoryloxy)-N,N-dimethyl-cis-crotonamide] on blood cholinesterase, digestibility of dietary components, utilization of N, and rumen fermentation. Bidrin residues were not found either in the urine or in the feces of animals ingesting Bidrin. Azodrin, a metabolite of Bidrin, was not present in the feces of treated animals but averaged 0.430 ppm. in the urine. Based on urine vol. this represented 1.5% of the ingested Bidrin. Blood cholinesterase was depressed to 30% of pretreatment values by the end of the 42-day expt. period, whereas activity of steers fed untreated silage was unaffected. In the metabolism trial conducted during the last 14 days of the 42-day period Bidrin had no effect on the digestibility of dietary components (dry matter, crude protein, ether ext., crude fiber, N-free ext., and gross energy), the utilization of N, or rumen fermentation.

RCLD

110582a Effect of a second dose of cadmium salts on vascular permeability in the rat testis. Clegg, E. J.; Carr, Ian; Niemi, M. (Univ. Sheffield, Sheffield, Engl.). *J. Endocrinol.* 1969, 45(2), 265-8 (Eng). Two doses of CdCl_2 were given to rats at intervals varying from 76 to 194 days. After the second dose the blood vessels in the testis and initial segment of the epididymis showed increased permeability, as demonstrated by i.v. markers. In the testis, leaking vessels were usually found in areas where interstitial cells were abundant.

RCKV

110583r Acid-base and electrolyte changes induced by acute isotonic saline infusion in the nephrectomized dog. Rosenbaum, Barry J.; Makoff, Dwight L.; Maxwell, Morton H.; Houghoughi, Michael (Cedars-Sinai Med. Res. Inst., Los Angeles, Calif.). *J. Lab. Clin. Med.* 1969, 74(3), 427-35 (Eng). The mechanism and extent of "dilution acidosis" by acute infusions of isotonic saline was studied in nephrectomized dogs. Infusions of 50, 75, and 100 ml./kg. of body wt. (BW) (Groups 1, 2, and 3) over a 30-min. period resulted in extracellular fluid expansions of $24.4 \pm 1.7\%$, $28.8 \pm 2.2\%$, and $33.9 \pm 5.5\%$, resp. pCO_2 was kept const. Body spaces were measured isotopically, and intracellular H^+ activity by 5,5-dimethyl-2,4-oxazolinedione-¹⁴C. The extracellular bicarbonate concn. decreased only -2.4 ± 0.7 meq./l. and -2.5 ± 0.4 meq./l. in Groups 1 and 2 and -3.0 ± 1.0 in Group 3. The total amt. of extracellular bicarbonate increased $+0.5 \pm 0.2$ meq./kg. of BW, $+0.8 \pm 0.2$ meq./kg. of BW, and $+1.5 \pm 0.4$ meq./kg. of BW in each group, resp. Concomitantly, the total amt. of extracellular fluid K increased $+0.3 \pm 0.0$ meq./kg. of BW, $+0.5 \pm 0.1$ meq./kg. of BW, and $+0.4 \pm 0.1$ meq./kg. of BW, resp., while there was no decrease in extracellular K concn. It was suggested that the extracellular bicarbonate and K concns. were defended by shifts of H^+ into cells (or bicarbonate out of cells), in conjunction with a shift of K out of cells. Despite the presumed H^+ (or bicarbonate) flux, there were no net changes of H^+ activity. The conceptual theory of extracellular "dilution acidosis" is valid but of limited magnitude and little clin. significance when expansion is relatively slow. Cellular buffering minimizes the extracellular acidosis, and the shift of K out of cells prevents hypokalemia.

RCKY

110584a Effect of erythropoietin on bone marrow α -amino-levulic acid synthetase and heme synthetase. Bottomley, Sylvia S.; Smithee, G. Ann (Veterans Admin. Hosp., Oklahoma City, Okla.). *J. Lab. Clin. Med.* 1969, 74(3), 445-52 (Eng). An in vitro culture method has been adapted for rabbit bone marrow and has permitted measurement of the effect of erythropoietin on Δ -aminolevulinic acid synthetase and heme synthetase activities in marrow cells. In this system, erythropoietin enhanced Δ -aminolevulinic acid synthetase activity. This effect was detectable as early as 6 hrs. after contact with erythropoietin. The max. enzyme activity observed was 200% greater in stimulated than in control cultures. Studies with inhibitors of protein synthesis suggested that erythropoietin increased the synthesis of the enzyme. No stimulatory effect by erythropoietin on heme synthetase activity was observed.

RCKY

110585t Action of adenosine triphosphate on the depressed spontaneous electrical activity of the dog cerebral cortex. B. n. Gian; Arrigoni, Elena; Ferrara, A.; Macherpa, P. (Pharmacol., Univ. Pavia, Pavia, Italy). *J. Pharm. Sci.* 1969, 58(9), 1101-3 (Eng). The repeated suppression of the ventricular and the circulation of the brain in the dog induces a high depression or a silence of elec. activity of the cortical and subcortical centers. The recovery of respiratory and circulatory

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