sociated compound were essentially excluded from CSF while a compound only slightly undissociated approached diffusion equilibrium. Previous studies have shown that both types of drugs are virtually excluded from CSF at 24 hours. Since 24 hours may be inadequate for equilibration the present studies have been extended to 96 hours. Sulfanilic acid (SA) and pAminohippurate (PAH) were compared. SA is often given a dissociation constant of 3.2, but is a strong acid, which is totally dissociated at body pH. PAH is a weak organic acid (pK=3.9); one part in 6,000 is undissociated at body pH. Plasma drug concentrations constant to ± 25% were maintained in dogfish by the subcutaneous injection of PAH every 8 hours, and SA every 12 hours. Three fish were studied with each drug at each time. Plasma, ventricular fluid (CSF), extradural fluid (EDF), bile, muscle and brain were sampled and analyzed by methods previously reported. The ratios of drug in fluid or tissue divided by mean drug plasma concentrations were calculated. At 96 hours the values with SA were CSF, 0.19; EDF, 0.85; bile, 0.54; brain, 0.18; muscle, 0.15. For PAH: CSF, 0.69; EDF, 0.83; bile, 1.74; brain, 0.20; muscle, 0.23. Ratios for SA at 24 and 48 hours were the same as at 96 hours. CSF and bile ratios for PAH were successively higher at 20, 40, 60 and 96 hours, while the ratios for EDF, muscle and brain were constant after 20 hours. These data clearly support the current hypotheses that the blood-CSF barrier may be lipoidal in nature, and is impermeable to dissociated drug, but is permeable to undissociated drug.

Transport of Organic Acid Dyes by the Isolated Choroid Plexus of the Spiny Dogfish, (S. Acanthias)

David P. Rall, Wendy Sheldon, and John M. Cohen
National Cancer Institute

Recent studies have indicated that organic acids are actively transported from the cerebrospinal fluid to the blood in the intact goat and in embryonal choroid plexus grown in tissue culture. It seemed of interest to determine if active transport of organic acid dyes could be demonstrated to occur *in vitro* in isolated choroid plexus tissue of a mature animal. This report presents evidence that the choroid plexus of the spiny dogfish can transport chlorphenol red across the choroidal epithelium. In this process the dye is concentrated in the lumen of the capillaries of the choroid plexus.

Fragments of dogfish choroid plexus about 1 mm. square were then obtained from all the ventricles and were placed in a dogfish Ringers solution. The usual concentration of the drugs was 3×10^{-5} molar. When the tissue was incubated in Ringers containing chlorphenol red, the lumen of the capillaries became bluish-red within 10-15 minutes. The color inside the capillaries unquestionably was more intense than the color of the surrounding solution. The cuboidal cells of the choroid plexus remained uncolored.

Incubation of the tissue at 2°C prevented the uptake of the dye and

caused a run-out of that previously accumulated at 18°C. 2, 4-Dinitrophenol, 2 x 10^{-4} molar, inhibited the uptake of the dye. Competition with another organic acid, p-aminohippurate (PAH), was demonstrated. Further, addition of 5 x 10^{-3} molar PAH to a tissue which already had concentrated chlorphenol red resulted in run-out of the luminal dye. This competition indicates that this process is stereospecific. Inhibition of dye uptake was complete when the medium was K-free, and was partial when Mg^{++} or Ca^{++} were omitted.

Phenol red was concentrated in the same manner as chlorphenol red. Bromphenol blue, on the other hand, was taken up by both the cells and, to a lesser extent, the lumen; this seemed independent of the metabolic activity of the tissue, since chilling to 2°C did not alter the uptake of the dye. Thus, the isolated choroid plexus of the dogfish behaved similarly to the isolated proximal tubule of the flounder kidney as described by Forster and, therefore, only the tubule and the choroid plexus have been shown to possess this activity.

Observations on the Formation of Blastoderm Cells in (Marinogammarus)

R. Rappaport and P. J. Donovan
Union College

In many Crustacea, blastoderm cells are formed when the nucleus and cytoplasm immediately surrounding it dissociate from a vesicle of yolk which varies in size and shape according to species. Since the activity resembles cytokinesis but is not accompanied by karyokinesis it is of unique interest. Gammarid embryos are favorable material for the study of this process. Embryos in early stages of blastoderm formation were dissected and the cells spread upon on the coverslip floor of an observation chamber in filtered, pasteurized sea water. Observations were made at 400X with an inverted microscope.

Before separation, there are marked changes in the surface contour. Constrictions and indentations may appear to traverse the length of the cell. Analysis of photographs however, reveals that lateral movements of the furrows are illusory and that the cytoplasm is, in fact, shifting from one side of the furrow to the other. Final separation from the yolk is accomplished after the presumptive blastoderm cytoplasm is sequestered at one end of the cell. Granules in the blastodermic cytoplasm move away from the future site of the cleavage furrow and droplets, apparently lipid, in the yolk become more compact. The beginning of separation is indicated by the intrusion of a furrow between the two types of cytoplasm. Constriction of the furrow appears to be a piecemeal process. In some cells, opposite sides of the furrow alternately intrude and regress. Small depressions which deepened and shallowed also appeared and coalescence of several such depressions perceptibly deepened the furrow. The furrow may either resemble that of the echinoderm egg or it may take the form of a