25,000. These latter coefficients differ from each other but are within the range of sedimentation coefficients reported by LI and PEDERSON[8] for BGH when measured in buffer solutions of different pH values. The fraction 2 material contained a trace of a fast-moving component with an S_{20}, w > 3.15.

BGH dissolved in low ionic strength aqueous solutions of ammonia was reproducibly resolved into two fractions of identical amino acid composition by exclusion chromatography on Sephadex G-25 gel. These results were unexpected since the molecular weight reported for this hormone should exceed the exclusion barrier of the gel for uncharged molecules by a factor of at least 9. Inhomogeneity within our BGH preparation was also indicated by electrophoretic techniques and ultracentrifugational studies. Such micro-inhomogeneities among highly purified proteinaceous hormones are not uncommon[9,10], but were never accounted for in a satisfactory manner. Two interpretations as applicable to our observations with BGH are considered in the following: a causative factor might be the existence of several conformational forms of the hormone differing in their mode of protein chain folding. These structures might represent different hormonal salt forms. Retardation of the hormone on the gel columns might also occur by means of the weak ion exchange properties of Sephadex G-25. Two major forms of BGH molecules would then be present with each having different affinities for the charges on Sephadex gel but with similar molecular weights. On the other hand, we might also assume that aggregational phenomena are responsible for these observations. A molecular weight of 45,000 for BGH could conceivably represent the value of a stable polymer of the hormone. The size of the monomeric basic unit would then be considerably smaller. The experimental conditions chosen for Sephadex G-25 gel exclusion chromatography might favor the temporary formation of the monomeric and possibly some intermediary forms of the hormone while running through the column bed. These forms would be very labile and subject to immediate reaggregation to higher molecular weight complexes after elution and lyophilization. The same argument might explain the discrepancies in weight distribution observed between the sedimentation and chromatographic studies[11].

Zusammenfassung. Hochgereinigtes Rinderwachstumshormon wurde durch Sephadex G-25 Gel-Chromatographie in zwei Komponenten zerlegt. Beide Fraktionen wie auch das unfraktionierte Präparat erwiesen sich in bezug auf Aminosäurenzusammensetzung, Elektrophorese und biologische Aktivität identisch.

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Culture of Macrophages under Homogeneous Static Magnetic Field

The number of macrophages kept in vitro decays during the first hours and later starts to increase. We have used macrophages obtained from the guinea-pig peritoneal cavity, culturing them in guinea-pig serum with Hanks solution.

In a preliminary group of experiments, series of tubes were kept in an incubator and other series were placed in the gap of an electromagnet. Every hour for 4 h we sampled one tube from each series and proceeded to count the number of macrophages in a Neubauer chamber. In each case the tubes which had been in the magnetic field gave a greater number of macrophages than the tubes which had been in the incubator. The magnetic field intensity was either 4200 oersteds or 5650 oersteds, and the temperature was either constant (around 27 °C, 30 °C, 37 °C etc.) or increasing (i.e. from 20–32 °C). Although a set of 6 practically homogeneous experiments from this group showed that differences from 27–33% in the number of macrophages were only statistically significant at a probability level ranging from 10–30%, the fact that the differences in this preliminary group were always in the same direction suggested that it would be desirable to carry out more experiments.

Another group of experiments was carried out subjecting the cultures to field intensities of 2000, 4000, 6000, and 8000 oersteds. The number of macrophages was compared to that given by tubes maintained in the pole gap, but without magnetic field. The temperature was always around 25 °C. Positive differences of 36, 46, 55, and 56%; 74%; 23, 30, 31, and 84%; 21 and 47%; and 17, 20, and 50% were significant at probability levels 1, 2, 5, 10, and 20% for the respective groups. A plotting of the number of macrophages against field intensity showed that the differences are greatest around 4000 oersteds.

We draw the conclusion that there is a magnetic effect in cultures of macrophages manifested by a larger number of viable cells, and that the effect is strongest at approximately 4000 oersteds. These results suggest that the magnetic field alters the metabolism of the macrophages and that the culture dynamics is changed.

Résumé. En cultivant des macrophages dans des champs magnétiques statiques et homogènes, on constate que le nombre de macrophages est le plus grand sous l'effet de champs de 2000 à 8000 oersteds, avec un maximum à 4000 environ.

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