

COMPARISON OF THE SERUM PROTEIN FRACTIONS OF THE
DEVELOPING CHICKEN EMBRYO BY THE TECHNIQUE OF
STARCH-GEL ELECTROPHORESIS

by

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Several workers have investigated the serum protein composition of the developing chicken embryo, by moving boundary(1-3) and paper electrophoresis (4-5) The ultracentrifugal analysis of the serum proteins of the early stage of embryonic development of chicken, as investigated by two groups of workers, are not in agreement in regard to the complexity of the molecular structure in that stage(1-2). Electrophoretic investigation does show, however, the multiplicity of the components in the early stage, although no complete agreement exists in regard to the number of the components and their relationship to those found in newly hatched and adult birds(6). Thus Hradec and Lemez(4) reported that the serum proteins of chicken embryo undergo considerable qualitative transformation throughout the development. The technique of starch-gel electrophoresis suggested by Smithies(7) enables one to detect in the serum pattern fractions that cannot be observed by other methods of electrophoresis. The pooled sera of five different age-groups of chicken embryo, incubated for 10, 13, 16, 19, and 21 days, were examined by the technique of starch-gel electrophoresis, run simultaneously on the same gel. The electrophoresis was performed on a vertical tray(8) for 18 hr., using borate buffer of pH 8.6 and a field-strength of 4 V./cm. Twelve fractions could be distinguished on the pattern of the serum from the embryo aged 21 days, as is shown in Fig. 1 (two pre-albumins are not shown), as was also indicated in ref. 6. At least nine components (except the prealbumins) could be distinguished on the pattern from the 10-day old chicken embryo, of which at least seven components corresponded in mobility to those found in the day-old chick. The patterns from the sera of 13, 16, and 19 days of incubation also showed similarity in pattern to that of the day-old chick. A component present in the sera of the 10-day and 13-day old embryo and situated somewhere between components *h* and *j*

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of 21-day old embryo was not distinguishable in the sera of the older embryos. The results presented here indicate that apparently with the exception of gamma-globulins and some other fractions, as demonstrated in Fig. 1, almost all other components present in the day-old chick are present in the serum of 10-day old embryo, as is revealed by the method of starch-gel electrophoresis, and that the transformation occurring throughout this period of development is apparently of a quantitative rather than qualitative nature.

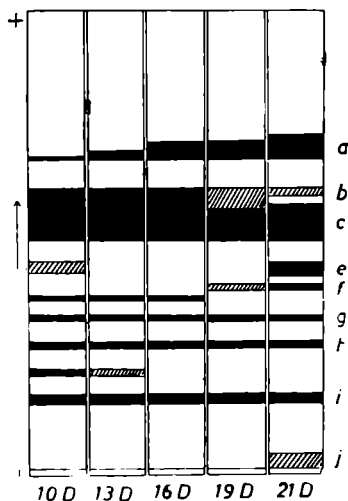


Fig 1. A schmatic representation of the starch-gel electrophoretic pattern of serum of the developing chicken embryo. The letters *a* to *j* refer to albumin and gamma-globulin. The numbers 10, 13, 16, 19 and 21 indicate the days of incubation. The striped bands represent the areas that could scarcely be distinguished on the original patterns

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