8139 C

Specificity of Hybrid Proteins.*

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As a result of crossing female domestic Ring doves with males of an Asiatic species, Irwin[1] reports the emergent evolution of a new protein specificity in hybrid doves, no trace of which is demonstrable in the erythrocytes of either parent.

To throw light on the probable immunochemical mechanism involved in this apparent non-conformity with Mendelian laws, we have tried to produce analogous test-tube hybridizations between proteins of 2 widely different animal species.

Serum proteins of the horse and domestic swine were selected for this purpose. To bring about rapid hybridization between these proteins, horse serum and swine serum were mixed in equal proportions, the resulting mixture diluted with 3 volumes of distilled water and then heated to 120°C. for 30 minutes. After cooling, the

TABLE I.
Titration with Antihybrid Rabbit Precipitin.

A. First Column: 0.2 cc. 50% antihybrid rabbit serum, plus 0.2 cc. serial dilutions of horse-swine hybrid proteins; incubator 2 hours; ice-chest over night; resulting precipitates estimated quantitatively (+, ++, +++, ++++). t, opalescence without demonstrable precipitate. 0, no demonstrable reaction.

Second column: Parallel tests with a fresh (*i. e.*, non-hybridized) mixture of the control preparations of horse serum and swine serum.

B. Retests with the same antiserum after specific absorption or removal of the anti-horse and anti-swine precipitins by incubating for 2 hours in the presence of a 1:80 dilution of a fresh (*i. e.*, non-hybridized) mixture of horse serum and swine serum.

Serial dilution of antigen	A. Tests with native antihybrid precipitin		B. Parallel tests with reduced antihybrid precipitin	
	Horse-swine hybrid proteins	Horse serum + swine serum	Horse-swine hybrid proteins	Horse serum + swine serum
1:40†	++++	+	++++	t
1:80	++++	+	++++	0
1:160	++++	0	++++	0
1:320	+++	0	+	0
1:640	t	0	t	0
1:1280	t	0	0	0
1:2560	0	0	0	0

*Work supported in part by the Rockefeller Fluid Research Fund of Stanford University School of Medicine.

[1] Irwin, R. R., Proc. Soc. Exp. Biol. and Med., 1932, **29**, 850.

†To change these dilutions into conventional titers, multiply the denominators by 10.

osmotic pressure was restored to normal by the addition of NaCl. As controls, unmixed horse serum and swine serum were similarly diluted, heated and restored to normal osmotic pressure.

Rabbits were immunized against the artificial horse-swine hybrid serum. A typical set of serological tests with the resulting anti-hybrid precipitin is recorded in Table I.

From the table it is seen that the artificial horse-swine hybrid serum contains one or more specific factors not present in horse serum or swine serum.

If an analogous fusion of paternal and maternal protein specificities takes place during sexual reproduction, the apparent emergent evolution of one or more new protein characters in certain hybrids would be in accord with Mendelian laws.

The above data are consistent with the current theory that the specific antigenicity of a given biological product is not determined solely by its specific haptene content, but is largely dependent on the topographical distribution of these haptenes on or within colloidal molecules.

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Iodine Values and Total Lipids of Leprous Human Blood Sera.*

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Recent renewed interest in serum lipid changes relative to the therapeutic effects of various unsaturated oils in skin diseases[1] prompted us to determine the iodine values and serum lipids of leprous patients receiving chaulmoogra therapy. Unsaturated oils, in addition to those of the chaulmoogra group, have been used with some success in leprosy, notably olive, cod liver, dilo, soy bean, margosa, and coconut, according to Cole.[2] De Vera has shown

* In cooperation with the Health Department of the Panama Canal and the Gorgas Memorial Laboratory, Panama; through the courtesy of Dr. H. C. Clark, Col. J. F. Siler, Dr. D. P. Curry, Dr. Ezra Hurwitz, and Mr. Everett Jacob. Supported in part by Eli Lilly and Co., Indianapolis, Indiana.

1 Hansen, A. E., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1198; *ibid.*, 1933, **31**, 160, 161.

2 Cole, H. I., *Intern. J. Leprosy*, 1933, **1**, 159.