Purification of Progestin(s): Oscar Wintersteiner

Crystalline Progestin
(Wintersteiner, O., and Allen, W. M. (1934) J. Biol. Chem. 107, 321–336)

Oskar Paul Wintersteiner (1898–1971) was born in Bruck, Austria. He received his Ph.D. degree from the University of Graz in microchemistry working with Pregl. He continued at the University of Graz as an assistant instructor until 1926 when he moved to Johns Hopkins University to work with John J. Abel, the author of a previous Journal of Biological Chemistry (JBC) Classic (1). At the time, Abel was trying to find the active principle in crystalline preparations of insulin thinking that it could be some low molecular weight organic compound. In spite of considerable effort, Wintersteiner and his laboratory colleague, Vincent Du Vigneaud, the author of a future JBC Classic, demonstrated that the hormonally active insulin preparations contained nothing but amino acids.

After his postdoctoral training with Abel, Wintersteiner spent a year working with P. A. Levene, also the author of a previous JBC Classic (2), at the Rockefeller Institute and in 1929 was appointed Assistant Professor of Chemistry at Columbia University. By 1940, he had achieved the rank of Associate Professor, and in 1941 he moved to Squibb Institute for Medical Research where he spent the years during World War II working on various projects related to national needs and the war effort. He purified penicillin and through microanalysis was the first to show that it contained sulfur.

The JBC Classic reprinted here demonstrates a classic approach to the isolation and characterization of important natural products that was standard prior to the general use of chromatography. As described in the introduction, there had been several reports of the isolation of progestin but no evidence that the preparations were pure. Wintersteiner and his collaborator Allen, an academic obstetrician/gynecologist at the University of Rochester, fractionated extracts prepared from rabbit corpus luteum and eventually succeeded in separating several compounds by fractional crystallization. The major component, compound A, had no hormonal activity as measured by the capacity to induce endometrial proliferation when injected into castrated rabbits. The remaining material was further fractionated to yield two different crystalline products, Compounds B and C, both of which had hormonal activity. Characterization of Compound B indicated that it was what now is known as progesterone. Compound C was either a different progestin or an alternative crystal form of progesterone. It was not realized at the time that progestin is a mixture of hormones among which progesterone constitutes the largest fraction.

Wintersteiner received widespread recognition for his work, particularly on the isolation and synthesis of adrenocorticosteroids, and was elected to the National Academy of Sciences in 1950.1

Robert D. Simoni, Robert L. Hill, and Martha Vaughan

REFERENCES
1. JBC Classics: Abel, J. J., and Taveau, R. DeM. (1905) J. Biol. Chem. 1, 1–32 (http://www.jbc.org/cgi/content/full/277/12/e1)

1 We thank Emil L. Smith, Emeritus Professor of Biological Chemistry at the University of California at Los Angeles for providing the biographical information about Wintersteiner for this JBC Classic Introduction.