Department of Chemistry
University of Kentucky
Lexington, Ky. 40506-0055

Tenth Annual Symposium on

Chemistry and Molecular Biology

established in memory of
Anna S. Naff

The New Embryology: Molecules and Mechanisms Determining Animal Form

Speakers
Dr. Gerald M. Edelman
Dr. Bruce A. Cunningham

March 30, 1984
Department of Chemistry
University of Kentucky
Lexington, Kentucky 40506

1984 PROGRAM

8:45 **Coffee—Chemistry-Physics Room 137**

9:15 **Welcome—Chemistry-Physics Room 139**

9:20 **Anna S. Naff: Biographical Notes**
—Dr. M. Benton Naff

9:30 **Cell Adhesion and Morphogenesis**
—Dr. G. M. Edelman 1972

There is at present no adequate theory of development in the sense that there are adequate theories of evolution and genetics. The reason is that the molecular processes leading to the formation in time of animal form are just beginning to be described. The key question is: How does the one dimensional genetic code specify a three dimensional animal of a given species?

Recent analysis of the fundamental processes regulating development has given new insights that promise an answer to this question. A major clue rests in our understanding of the molecules that mediate the adhesion of one cell type to another. Some of these molecules are now identified and experiments on the times and places of their expression give further clues to their regulation during development. This in turn bears on how cells move and tissue sheets fold to form embryonic patterns. In this lecture, I will review these issues in preparation for a detailed discussion of the nature of cell adhesion molecules.

10:30 **Discussion**

10:40 **Coffee Break**

11:00 **Cell Adhesion Molecules**
—Dr. B. A. Cunningham

Immunologic assays have recently been used to identify and purify large cell surface glycoproteins involved in cell-cell adhesion. These molecules were first described in embryonic chicken tissues, but they appear to have counterparts in all vertebrate species. In this lecture, I will discuss the structures and properties of three of these glycoproteins in terms of their functions and mechanisms of cell adhesion.

In the nervous system, calcium-independent adhesion between neurons is mediated by the neural cell adhesion molecule (N-CAM); the binding is homophilic. During development the molecule (Mr = 200,000 to 250,000) undergoes a transition from an embryonic (E) to discrete adult (A) forms with a concomitant increase in the strength of binding between N-CAM molecules. Interactions between neurons and glia appear to involve a different adhesion system that includes the neuronal molecule, Ng-CAM. Ng-CAM does not appear on glial cells, suggesting that neuron-glial interactions involve a heterophilic mechanism. Calcium-dependent cell-cell adhesion among liver cells is mediated by the molecule L-CAM, a glycoprotein of Mr = 124,000. Although first detected on liver cells, L-CAM is present on nearly all epithelial cells and appears to be comparable to the molecules involved in the compaction of early mouse embryos and adhesion between teratocarcinoma cells.

12:00 **Discussion**

2:30 **Meeting with Graduate Students and Faculty—CP 137**

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Anna Lea Schoulties Naff

Anna Lea Schoulties was born on a farm in northern Kentucky on November 29, 1920.

During her early education at Cold Spring High School her favorite subject was mathematics. She was the salutatorian of her class. After finishing high school Anna worked summers and studied for two years at Eastern Kentucky University. She worked for a year at Williamson Heater in Cincinnati before transferring to the University of Kentucky's Department of Home Economics. Her graduation in 1944 was "with distinction".

Receipt of a Haggin Fellowship enabled Anna to undertake undergraduate and graduate work in Chemistry. She received a Master of Science degree in 1946; a publication based on her thesis appeared in 1947.

Anna was married to Benton Naff in December, 1946, in Portland, Oregon. In 1946-47 she taught chemistry at the University of Kentucky and in 1947-50 at Oregon State University.

While her husband was located at Bowling Green State University in Ohio, Anna attended the University of Michigan in Ann Arbor, earning a Master of Arts degree in Library Science. At that time (1953) she began research with the Owens Illinois Glass Company exploring the properties of epoxy resins and silicones. Her investigations resulted in an important practical contribution: the invention of an organic ink for use on glass, patent issued 1958.

When the family moved from Ohio to Washington, D.C. in 1955, Anna's research continued, but in an academic environment. She assisted her husband in the acquisition of grants and produced a number of chemical research publications (1955-63).

During her husband's 1964-65 sabbatical, Anna served as a librarian at Brown University. A year later she continued her library work, first at the National Bureau of Standards and then at the National Institutes of Health. Her experience in Acquisition and Cataloging provided significant professional advancement and she continued at NIH until the end of her career. Anna died September 21, 1973.

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