

Cornelia “Nina” Post Channing (1938–1985)



Nina Channing

Cornelia Post Channing was born on 23 April 1938 in Boston, Massachusetts.

Education and Career

Nina received a B.A. degree from Hood College in Frederick, MD, in 1961, and did her graduate work with Dr. Claude Villee, at Harvard Medical School, receiving the M.A. degree in 1963 and the Ph.D. in Biochemistry in 1965. Her graduate studies investigated the effects of LH on luteinized rat ovaries. She went to England to do a Post Doctoral Fellowship in the laboratory of Roger Short at Cambridge. While there she began her studies of luteinization of granulosa cells after being separated from the oocyte.

When she returned to the U.S., she spent seven years in the Department of Physiology at the University of Pittsburgh Medical School, as an Instructor and Assistant Professor, before moving to the University of Maryland Medical School in 1973 as an Associate Professor of Physiology, where she remained until her death in 1986. She was promoted to professor in 1976.

Research

Early in her career Nina Channing recognized that the different fates of ovarian follicles within an ovary, with some going on to ovulate and form corpora lutea and others dying, suggested different intraovarian signals influencing different follicles. Further, the heterogeneous cell types within each follicle, oocyte, granulosa cells and thecal cells, must be responding to locally generated signals as well as to the gonadotropic hormones LH and FSH. It had been observed that when oocytes were removed from the surrounding granulosa cells, the oocytes completed meiosis, and the granulosa cells developed LH receptors and luteinized. These observations started her on a search for substances in antral fluid which inhibit meiosis, called Oocyte Meiosis Inhibitor (OMI), and for an inhibitor of LH receptors, called LHRBI. These studies were carried out with the collaboration of Alex Tsafiri, Florence Ledwitz-Rigby, and Darrell Ward. A third substance in antral fluid, responsible for inhibition of FSH secretion, folliculostatin or inhibin, was also the subject of a search by the laboratories of Channing, Ward, and Schwartz. Her early death precluded her from purifying and identifying the true nature of these substances.

Subsequent work by others shortly after her death, utilizing sensitive and specific molecular techniques, isolated a family of proteins, including inhibin and activin, from follicular fluid. This family of Transforming Growth Factor (TGF β) peptides, and receptors, has turned out to be important for development, bone morphogenesis, and local ovarian secretion. Their identification and purification were made possible by Nina's use of antral fluid, which provided copious amounts of starting material. It is so sad that she did not live long enough to know of these startling substances.

With respect to OMI and LHRBI, as the science of growth factors expanded, it became apparent that several growth factors found within follicular fluid were responsible for the activities she reported. I have already mentioned the TGF β family. Local epidermal growth factors (EGF) seem to be involved in the effects of LH in causing completion of meiosis. Insulin growth factor (IGF) is necessary for maintenance of granulosa cells in culture, probably explaining Nina's very early observation that adding insulin to culture medium contributed significantly to cell health.

Nina had the courage and vision to take the *in vitro* steps of looking for molecules necessary for the actions of LH. Her goal was contraceptive research; she remained hopeful that by recognizing the intermediate steps between the preovulatory surge of LH, and ovulation, molecules could be found with the ability to inhibit specific steps in the ensuing processes.

Awards

Nina won many awards for her research work. A manuscript she wrote on LH receptor binding protein, "Control of Luteinization in Granulosa Cell Cultures," won the AAAS Newcomb-Cleveland Prize for the outstanding paper in *Science* in 1969.

She won the SSR Research Award in 1978, the very first time it was given. The citation emphasized that the award was designated for a mid-career scientist "...whose research record provides a high standard upon which all subsequent nominees may be judged..." (*Biology of Reproduction* 20:129, 1979). Her work on inhibin, LHRBI and OMI was cited, as well as her comparative approach to ovarian physiology, utilizing material from pigs, monkeys, humans, and turtles.

In the same year she was awarded the Ernst Oppenheimer Prize, by the Endocrine Society. This award is presented to an investigator who has not yet reached his/her 41st birthday. This citation (*Journal Clinical Endocrinology & Metabolism* 47:229, 1978) emphasized her three findings with respect to components in follicular antral fluid:

- a. inhibition of meiosis in oocytes;
- b. inhibition of *in vitro* granulosa cell luteinization and
- c. inhibition of FSH secretion.

Nina was also described as a "...generous teacher, trainer, and collaborator."

Other professional activities

Nina served on the Board of Directors of SSR in 1978–1980. She also served on several NIH study sections. She was one of the founders of the biennial Ovarian Workshop, and the prize for the best poster abstract by a new investigator presented at the workshop is named in her honor. During the 1970s and '80s, a number of international workshops were held in the US, Canada, Italy and India on the subject of ovarian peptides or "factors," and Nina was an organizer or participant in every one of them. The workshop/symposium on *Meiotic Inhibition: Molecular Control of Meiosis*, held at NIH in January 1987 was dedicated to her memory.

Julia Lobotsky tells a poignant story about Nina's final days, before she died of breast cancer.

"...They had talked for some time about Julia's going to visit her.... On Palm Sunday Julia went over to meet her at the University of Maryland ... Julia and Nina walked about the Baltimore harborside and visited the aquarium.... They had a great time.... Nina was in excellent spirits but tired more easily than normal ... they ate at a nearby restaurant and Nina, who was unable to eat very much, got a doggy bag to take some of the seafood home for her two cats.... On Friday Julia called her lab and learned that she was home not feeling well ... on Tuesday Julia received phone calls notifying her of Nina's death."¹

Nina died on April 8, 1985 at the age of 46. She had launched a new field, searching for local factors within the follicular fluid of mammalian ovaries. She was a friend and collaborator of many reproductive biologists who have missed her presentations at meetings and her fresh ideas.

“Few of us make the contributions in a long career that Nina Channing made in her short lifetime.”¹

¹Lobotsky, Julia and Schwartz, N.B. Channing, Cornelia P. (biosketch). In: *Zur Geschichte der Endokrinologies und Reproduktions-medicin*, (Gerhard Bettendorft (Hrsg.) editor). pp.86–87, 1995.

Neena B. Schwartz
Northwestern University