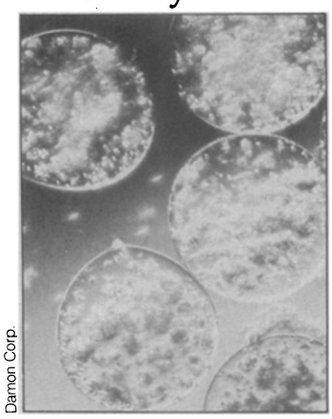
BIOLOGY

Zig-zag DNA and fruit fly chromosomes

Two years ago scientists were surprised to find that some stretches of DNA twist jaggedly to the left instead of spiraling smoothly to the right. The early data were based on atomic resolution X-ray crystallographic analysis of a simple stretch of DNA synthesized in a laboratory (SN: 12/22 & 29/79, p. 420). Now Alfred Nordheim and Alexander Rich of the Massachusetts Institute of Technology and colleagues report evidence for this special form of DNA, which they call Z-DNA, in a natural setting—the chromosomes of the fruit fly. To locate Z-DNA, the scientists produced a rabbit antibody that binds to the DNA when it is in its Z conformation, but not when it forms the more common right-handed helix. The antibodies bind to the chromosomes in a "very reproducible" pattern, Nordheim and co-workers report in the Dec. 3 NATURE. The chromosomes contain regions of tight coiling and regions of more extended material. The anti-Z-DNA antibodies bind only to the more extended "interband" regions. The scientists speculate, "Because the Z conformation is a reversible structural form of DNA it is an attractive candidate for having a regulatory role in genetic activity." They plan to examine the patterns of Z-DNA staining during the transcription of certain genes in the fruit fly chromosomes.

Balls of hybridoma



Damon Corp.

Monoclonal antibodies, useful for research, purification, diagnostic tests and experimental therapies, are generally produced either from cells growing in culture fluid or in the peritoneal cavity of a mouse. Now the Damon Corp. has announced a new process for large-scale production of monoclonal antibodies. The antibody-producing cells, called hybridomas, are trapped in tiny spheres of porous carbohydrate membrane. The cells are harvested after a week, when there are about 10,000 per 500-micron capsule. In the solution collected from inside the spheres, 40 to 50 percent of the protein is pure monoclonal antibody. The concentration of antibody is only 1 percent in solutions generated by the conventional cell culture method and 5 percent in the mouse procedure. Damon Corp. is collaborating with the pharmaceutical company Hoffman-LaRoche, Inc. to use the microencapsulation technique to produce the monoclonal antibodies used in purifying human interferon.

Hen time: Longer days, stronger eggs

The biological clock of a chicken runs on 28-hour days. Allowing hens to follow this inherent cycle results in bigger, stronger-shelled eggs, Cornell researchers find. They have worked out the lighting cycle that gives the best eggs. Strangely enough, it is two hours of light, six hours of dark, two more hours of light and finally eighteen hours of darkness. Ari van Tienhoven reports one Leghorn strain increased its average egg weight by almost 10 percent. And all the test strain boosted shell strength about 10 percent. The new lighting scheme does not produce a greater total weight of eggs for each hen, but it evens the size, throughout the year eliminating small eggs. To reduce the problem of egg collection at inconvenient hours, the scientists are now trying to switch hens back to a 24-hour cycle.

BEHAVIOR

Deflating Christmyth depression

In 1941, a psychiatrist named Eisenbud wrote in a psychoanalytic journal that Christmas is the time of "greatest relaxation on the part of the super-ego of society." He went on to describe two cases in which women had recurrent Christmas symptoms related to "an intense wish for a penis and the forlorn hope that Santa Claus would magically provide one." Another psychiatrist, named Sterba, wrote three years later that the celebration of the miraculous birth on Christmas activated "the complex of feelings, wishes, magical fulfillments or frustrations of childbirth."

These are just two explanations given over the years relating to why the holiday season might arouse feelings of depression, aggression, loneliness, hopelessness and other discomforting states of mind.

Now, however, psychiatrists are beginning to question not only why such a Christmas syndrome might occur, but if it occurs at all. In examining scientific literature on the subject — as opposed to isolated clinical reports and popular magazine and newspaper articles — it is clear that there is little hard evidence to support the theory that holidays are associated with an increased incidence of psychopathology, researchers from the Duke University Medical Center report in the December ARCHIVES OF GENERAL PSYCHIATRY. "Statistical studies ... consistently have shown the Christmas season to be associated with a low incidence of suicide and psychiatric hospitalization," write James R. Hillard, Jacqueline M. Holland and Dietolf Ramm.

In their seven-year study of psychiatric emergency cases at their own facility, the Duke researchers found that "emergency psychiatric visits...are relatively less frequent overall during the Christmas season than during the rest of the year." They report a dip in such visits during the several weeks before Christmas and a corresponding rise for several weeks afterwards. They suggest this may reflect a strengthening of "social support" from family and friends prior to the holiday and the loss of this increased support when the holiday ends.

The scientists conclude that the holiday syndrome should not be totally dismissed as a myth—they acknowledge that "some of the Christmas season hope is related to magical wishes for passive resolution of problems, and it is probably people who have gotten through the season on this sort of hope who decompensate in the New Year, with its demand of resolutions for active change." But, they write that "this study suggests the existence of positive psychosocial effects of holidays that in the past have received less attention in the psychiatric literature than the negative effects."

Spinal injury: Depression not universal

The theme of the play/movie "Whose Life Is It Anyway" involves whether a recently paralyzed person is too depressed to make a rational decision about whether he wants to die or continue to live. In a study of 30 patients with spinal cord injuries, a University of Wisconsin research team has found that contrary to prevailing beliefs, far from all persons with such injuries experience depression, although "significant depressive disorders develop in a significant minority."

Reporting in the December ARCHIVES OF GENERAL PSYCHIATRY, Donald T. Fullerton and his colleagues suggest that "universal reports of depression in spinal cord injuries...may be a result of confusing despondency with depressive disorders. Despondency is a common reaction to a serious illness but in general is brief, nonpervasive and not accompanied by many vegetative, cognitive or behavioral symptoms." Many previous studies might be incorrect because they did not use standard diagnostic criteria, according to the researchers.