Drug Slows Parkinson's Progression

A drug treatment given during mild stages of Parkinson's disease seems to delay the progression to full-blown disease and may prolong the lives of people with this devastating neurologic disorder, according to a preliminary research report. If the finding is verified, scientists eventually may find other agents capable of retarding the brain cell destruction seen in related disorders such as Alzheimer's disease.

"The report could be a striking advance in the treatment of neurodegenerative disorders," comments Thomas N. Chase of the National Institute of Neurological Disorders and Stroke in Bethesda, Md.

Scientists hail the experimental treatment as the first Parkinson's therapy that seems to get at the root cause of the disease. "This is the first treatment for Parkinson's disease that has been shown to alter the underlying mechanism of neuronal destruction," says Donald B. Calne, who studies the disease at the University of British Columbia in Vancouver.

Parkinson's patients experience steady decline as an unknown process destroys certain dopamine-producing neurons in the brain's substantia nigra region. The gradual loss of the neurotransmitter dopamine causes a variety of symptoms, including tremors and a shuffling gait, the hallmarks of Parkinson's disease. When patients can no longer function at home or on the job, doctors prescribe levodopa, a drug that eases symptoms by converting to dopamine in the brain. Most physicians prescribe levodopa only as a last step because many patients eventually develop severe side effects such as nausea and confusion.

Now James W. Tetrud and J. William Langston of the California Parkinson's Foundation in San Jose report that early treatment of mild Parkinson's with a drug called deprenyl (also known as selegiline) delays the need for levodopa by nearly eight months — a significant finding because the longer doctors can stave off full-blown disease, the longer their patients can expect to live. The researchers studied 54 people with early Parkinson's, giving half the patients 10 milligrams of deprenyl daily and the other half placebo pills. Deprenyl-treated patients took an average of 548.9 days to develop symptoms severe enough to warrant levodopa therapy — a period roughly double that of controls, the researchers note in the Aug. 4 SCIENCE.

Scientists don't know deprenyl's exact mechanism of action, but Tetrud and Langston propose the drug protects dopamine-producing neurons from a toxic metabolite of a chemical known as MPTP. Some researchers believe Parkinson's disease is caused by MPTP or a similar chemical found in the environment (SN: 10/5/85, p.212). Tetrud and Langston theorize that deprenyl might slow disease progression because it inhibits monoamine oxidase B, an enzyme that converts MPTP to MPP^+, the metabolite that kills neurons in the substantia nigra region.

The Food and Drug Administration approved deprenyl in June as an adjuvant therapy to inhibit dopamine breakdown in severely ill Parkinson's patients taking levodopa. It has not yet approved deprenyl's use during the mild stage of Parkinson's disease, but some researchers believe the evidence suggests such treatment has clear advantages with very few side effects.

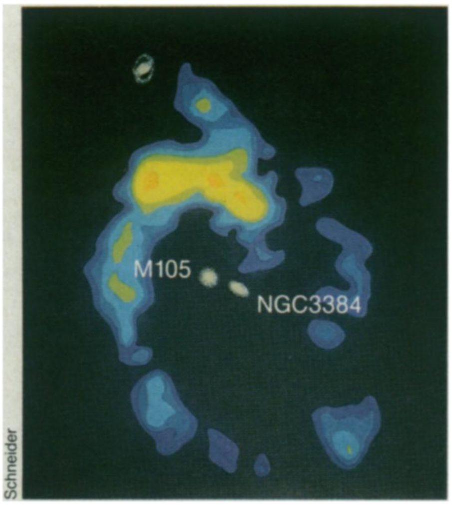
"If I were a patient, I'd definitely take deprenyl," Calne says. "This is the first report [on any Parkinson's drug] that has made me say that."

Tetrud and Langston agree that deprenyl may help mild-stage patients, but they say more extensive research is needed to confirm the promising early findings. — *K.A. Fackelmann*

Ringing in a new estimate for dark matter

Amid the starlight, tenuous dust and empty space in the voids between galaxies, an exotic structure discovered earlier in the decade stands alone: a halo of hydrogen gas heavier than 2 billion suns, the only primordial intergalactic cloud ever identified. Past measurements of this elliptical ring in the constellation Leo have yielded important information about its structure and the pair of galaxies it orbits.

But new observations indicate astronomers have overestimated by about a factor of 10 the amount of "dark" matter — mass hidden from view because it does not radiate at any observed wavelength — in the M96 galaxy group that contains the unusual ring. In addition, statistical analysis of 155 other small galactic groups suggests scientists have similarly misjudged the amount of dark matter in these systems, asserts Stephen E. Schneider of the University of Massachusetts at Amherst, who originally discovered the ring (SN: 3/5/83, p.148).



False-color radio image of hydrogen inside a ring — perhaps leftover from the Big Bang — orbiting galaxies M105 and NGC3384. Orange indicates highest hydrogen intensity, violet the lowest. Galaxy at top distorts the ring's orbit.

Although Schneider's findings may not apply to larger galaxy clusters, several astronomers say the revised estimates fit with other observations indicating the heavens hold only enough total mass to generate a relatively weak gravitational tug. Some theories contend the universe contains enough matter to force its eventual gravitational collapse. But without sufficient mass, it might expand forever.

The ring, reports Schneider in the Aug. 1 ASTROPHYSICAL JOURNAL, "provides some of the most direct dynamical evidence yet for the lack of dark matter — at least to the extent supposed by many — in one group of galaxies." Using the Arecibo telescope in Puerto Rico to measure the velocity of radio-wave-emitting hydrogen at different points around the ring, Schneider deduced how much mass the galactic pair at the ring's center must have to keep the ring in orbit. That amount, he says, is only about twice as large as the mass within the luminous regions of the two galaxies. The lower-than-expected ratio between the two mass values yields a dark-matter estimate that is one-tenth the amount calculated for M96 and other small galactic groups before the ring's discovery.

Moreover, Schneider says his statistical analysis of data from small galaxy groups indicates astronomers may be assigning too many distant, high-velocity galaxies to such groups. This, he says, may have led to inflated estimates of the dark matter required to hold member galaxies together. Schneider's statistical argument, notes Morton S. Roberts of the National Radio Astronomy Observatory in Charlottesville, Va., could account for the uneven spread of velocities among individual galaxies in a group. — *R. Cowen*